CONTENTS

Academic Calendar .......................................................... 2
Message from the Chancellor ............................................. 4
Administration ................................................................. 5
General Information ........................................................ 7
The Graduate School ......................................................... 43
School of Architecture and Planning ................................... 55
College of Business and Administration and Graduate School of Business Administration ........................................ 73
School of Education .......................................................... 101
College of Engineering and Applied Science ....................... 133
College of Liberal Arts and Sciences .................................. 163
Military Science ............................................................... 255
Graduate School of Public Affairs ....................................... 259
Faculty ........................................................................... 269
Index .............................................................................. 278
<table>
<thead>
<tr>
<th>Spring 1990</th>
<th>Fall 1990</th>
<th>Spring 1991</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 8-12</td>
<td>Orientation</td>
<td>August 17-22</td>
</tr>
<tr>
<td>January 15</td>
<td>Holiday (no classes)</td>
<td>August 23</td>
</tr>
<tr>
<td>January 16</td>
<td>First day of classes</td>
<td>September 3</td>
</tr>
<tr>
<td>March 19-23</td>
<td>Spring vacation (no classes)</td>
<td>November 22-23</td>
</tr>
<tr>
<td>May 14</td>
<td>End of semester</td>
<td>December 17</td>
</tr>
<tr>
<td><strong>Summer 1990</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 22-28</td>
<td>Orientation</td>
<td>January 7-11</td>
</tr>
<tr>
<td>May 29</td>
<td>First day of classes</td>
<td>January 14</td>
</tr>
<tr>
<td>July 4</td>
<td>Holiday (no classes)</td>
<td>January 15</td>
</tr>
<tr>
<td>August 7</td>
<td>End of term</td>
<td>March 18-22</td>
</tr>
</tbody>
</table>

1 The University reserves the right to alter the Academic Calendar at any time.
2 Consult the Schedule of Classes for application deadline dates, deadlines for changing programs and registration dates and procedures.
Although this catalog was prepared on the basis of the best information available at the time, all information (including the academic calendar, admission and graduation requirements, course offerings and course descriptions, and statements of tuition and fees) is subject to change without notice or obligation. CU-Denver is an affirmative action/equal opportunity institution. For current calendars, tuition rates, requirements, deadlines, etc., students should refer to a copy of the Schedule of Classes for the semester in which they intend to enroll.

The courses listed in this catalog are intended as a general indication of the University of Colorado at Denver curriculum. Courses and programs are subject to modification at any time. Not all courses are offered every semester, and the faculty teaching a particular course or program may vary from time to time. The instructor may alter the content of a course or program to meet particular class needs.

Courses are listed by college or school.
Message From the Chancellor

Dear Student:

Welcome to the University of Colorado at Denver. On behalf of the faculty, staff, and students, I offer to you the challenging environment of one of Colorado's premier institutions of higher education. Your decision to attend CU-Denver shows your willingness to learn at Denver's only urban public university.

CU-Denver is one of the four campuses of the University of Colorado system. As a vital part of that system, offering baccalaureate, master's, and doctoral programs, we have achieved distinction nationally and internationally because of the high quality of our programs, faculty, and alumni. Located in downtown Denver, the University challenges its students both academically and personally in an intellectual environment that encourages commitment, curiosity, and imagination.

A distinguishing characteristic of CU-Denver is our urban perspective that is an integral theme in our academic programming, the orientation of our faculty, and the identity of our student body. Since 1972, enrollment has grown to approximately 10,470 students, including 5,880 undergraduates and 4,590 graduate students.

The University offers some 40 degree and degree option programs at the baccalaureate level and over 60 degree and degree option programs at the post baccalaureate level designed to provide you with a foundation on which to build your intellectual, aesthetic, and moral capacities as individuals and as citizens. Components of this educational experience include student involvement in independent study, research, and the creative process as a complement to classroom study. The University's seven colleges and schools (Business, Public Affairs, Liberal Arts and Sciences, Engineering and Applied Science, School of the Arts, Education, and Architecture and Planning) and The Graduate School provide instruction and research programs that focus on the fundamental areas of knowledge, including interdisciplinary and professional study. We are committed to making available to you the opportunities for gaining knowledge, training, skills, and credentials which will enhance your economic and personal lives.

We at the Denver campus take great pride in the diversity of our students and our ability to serve their varied needs. This is reflected in a commitment to an enriched baccalaureate education and the applied aspects of graduate and professional work. Our academic programs focus on applications relevant to regional as well as national issues and also seek to provide a humanistic understanding of social needs and problems.

We look forward to working with you as you join our community of scholars/teachers and dedicated staff. I promise a rich intellectual environment and a challenging educational experience. Most of all, I look forward to seeing you at graduation and awarding you the CU-Denver degree.

My best wishes to you and to your future.

John C. Buechner
Chancellor
University of Colorado at Denver
ADMINISTRATION

Board of Regents

KATHY ARNOLD, Littleton, term expires 1994
RICHARD J. BERNICK, Littleton, term expires 1992
ROBERT E. CALDWELL, Colorado Springs, term expires 1992
PETER C. DIETZE, Boulder, term expires 1990
LYNN J. ELLINS, Longmont, term expires 1990
HARVEY PHELPS, Pueblo, term expires 1994
NORWOOD L. ROBB, Littleton, term expires 1990
ROY H. SHORE, Greeley, term expires 1992
DAVID WINN, Colorado Springs, term expires 1994

University-Wide Officers

E. GORDON GEE, President of the University; Professor of Law. B.A., University of Utah; J.D., Columbia University; Ed.D., Teacher's College, Columbia University.

LAWRENCE MESKIN, Vice President for Academic Affairs and Dean of the System-wide Graduate School; Professor of Dentistry. D.D.S., University of Detroit; M.P.H., University of Minnesota, School of Medicine; M.S.D., Ph.D., University of Minnesota.

GLEN R. STINE, Vice President for Budget and Finance. B.A., Michigan State; M.A., University of North Carolina, Chapel Hill, Ed.D., Harvard University.

THEO. VOLSKY, JR., Vice President for Administration; Professor of Psychology. B.S., M.S., Kansas State University; Ph.D., University of Minnesota.

H.H. ARNOLD, Executive Secretary of the Board of Regents and of the University. B.A., LL.B., University of Colorado.

JAMES A. STROUP, Treasurer for the University and Assistant Vice President for Budget and Finance. B.S., Michigan Technical University; M.B.A., Michigan State University.

CU-Denver Officers

JOHN C. BUECHNER, Chancellor; Professor of Public Affairs. B.A., College of Wooster; M.P.A., Ph.D., University of Michigan.

BRUCE W. BERGLAND, Executive Vice Chancellor; Associate Professor of Education. B.S., Iowa State University; Ph.D., Stanford University.

JOHN BERNHARD, Vice Chancellor for Administration and Finance. B.A., Stanford University; M.B.A., Columbia University, Graduate School of Business.

MARK A. EMMERT, Associate Vice Chancellor for Academic Affairs; Associate Professor of Public Affairs. B.A., University of Washington; M.P.A., Ph.D., Syracuse University.

KENNETH HERMAN, Associate Vice Chancellor for Administration and Finance. B.S., University of Colorado.

SHELIA M. HOOD, Associate Vice Chancellor for Enrollment and Student Services. B.A., M.A., Colorado State University.

FERNIE BACA, Assistant Vice Chancellor for Research and Creative Activities; Associate Professor of Education. B.A., University of Northern Colorado; M.A., Ph.D., University of Colorado.

JULIE CARNAHAN, Assistant Vice Chancellor for Planning and Information Resources Management. B.A., M.A., University of Colorado; Ph.D., University of Michigan.

The University of Colorado seal, adopted in 1908, depicts a male Greek classical figure seated against a pillar and holding a scroll. A burning torch framed in laurel is placed beside him. The Greek inscription means "Let your light shine." According to Denver designer Henry Reed, the classical design was used because Greek civilization "stands as the criterion of culture." The laurel symbolizes honor or success, the youth of the figure suggests the "morning of life," and the scroll represents written language.
The University of Colorado at Denver is one of the most important educational resources in the Denver metropolitan area. CU-Denver, one of four institutions in the University of Colorado system, is an urban, non-residential campus located in downtown Denver. Major civic, cultural, business, and governmental activities are in close proximity.

CU-Denver offers undergraduate degrees in more than 40 fields and graduate degrees in more than 60. Ph.D. degrees are offered in public affairs, applied mathematics, and educational administration. Doctoral studies also are available in engineering and other fields in cooperation with CU-Boulder. Special emphasis is placed on programs that will help assure students professional opportunities after graduation. All programs are tailored to meet the needs of the diverse student population. Classes are offered during weekday and evening hours, and on weekends.

Students’ ages range between 17 and 75. The average student age is 29. Two-thirds hold full-time jobs and 60 percent attend part time. Sixty-two percent are enrolled at the upper division or graduate levels.

CU-Denver’s faculty actively promote the special role of an urban institution in meeting the needs of students. Many faculty bring their work experiences to the classroom. They are alert to the challenges and advances of the urban environment and responsible to the needs of students and the community. The combination of CU-Denver’s talented faculty and highly motivated students creates a vital and exciting educational environment. Students are offered the unique educational opportunity to combine “real world” experience with academic excellence.

History

Just over a century ago the University of Colorado was founded in Boulder, in 1876. In 1912, the University of Colorado’s Department of Correspondence and Extension was established in Denver, to meet the needs of the burgeoning population. As the breadth of course offerings expanded, so did the demand for degree-granting status. The Denver Extension Center was renamed the University of Colorado-Denver Center in 1965, and by 1969, 23 fields of undergraduate study and 11 of graduate study were offered. In 1972 the Colorado General Assembly appropriated support to build the Auraria Campus, CU-Denver’s current site. And in this same year the Denver “Center” was renamed CU-Denver. Two years later the University of Colorado was reorganized into four campuses — Denver, Colorado Springs, Health Sciences (Denver), and Boulder.

University of Colorado System

As one of four campuses of the University of Colorado, CU-Denver has a special role and mission in Colorado higher education. The University of Colorado at Boulder now serves about 22,000 students enrolled in undergraduate, graduate, and professional programs. The Health Sciences Center in Denver provides education and training to medical, dental, nursing and allied health personnel. The University of Colorado at Colorado Springs serves more than 5,500 students in the Pikes Peak region, offering undergraduate, graduate, and professional programs. CU-Denver’s role within the University system is primarily to address the needs for undergraduate and graduate instruction in the Denver metropolitan area. Emphasis is given to professional, preprofessional, and liberal arts training in the context of a strong multidisciplinary and applied agenda for research and creative activities. CU-Denver students have access to the library resources of all campuses and cultural events sponsored within the University system.

Academic Structure

Each of the four campuses of the University of Colorado System — Denver, Boulder, Colorado Springs, and Health Sciences in Denver — has its own Chancellor and campus administration. The Chancellors, in turn, report to the President of the CU-System. The Board of Regents of the University of Colorado approve the overall direction provided by the President of the System. The System President represents the University of Colorado and manages the planning for development of the System, apportionment of resources across campuses, the System-wide Graduate School, and general policy regarding academic standards, instructional initiatives, and faculty and staff personnel matters, and is supported by a system-wide Faculty Senate.

The Chancellor of CU-Denver represents CU-Denver and manages campus goal-setting, policy development, academic affairs, and budget and financial matters. The Executive Vice Chancellor and the Vice Chancellor for Administration and Finance assist the Chancellor. Each vice chancellor is responsible for the essential components of the campus enterprise. The Executive Vice Chancellor is responsible for Academic Affairs, The Graduate School, Sponsored Projects, Admissions and Records, Enrollment Management, Planning and Institutional Research, and Student Services. The Vice Chancellor for Administration and Finance is responsible for the campus budget, Office of Financial and Business Services, and Personnel Services. The CU-Denver Graduate School is a component of the CU System-wide Graduate School. All graduate units reside within The Graduate School except Architecture and Planning.

Academic Programs

CU-Denver is, above all, devoted to the needs of the citizens of Denver and the region. With the rapid development of the national recognition earned by its graduate faculty, it is not surprising that an increasing number of advanced students from across the nation and overseas elect to pursue their studies here. Today CU-Denver is composed of seven distinct academic units:

- School of Architecture and Planning
- College of Business and Administration
- Graduate School of Business Administration
- School of Education
- College of Engineering and Applied Science
College of Liberal Arts and Sciences
School of the Arts
Graduate School of Public Affairs

These units now accommodate over 10,000 students taught by about 300 regular, full-time faculty members. The diversity of the student body is a hallmark of CU-Denver and a source of deep pride. Among them are traditional students who have elected to pursue college degrees immediately after high school. There also are older students who, perhaps for financial reasons or the press of family commitments or because they've only lately recognized the value of a college education, have delayed entry. And there are professionals who seek to strengthen their base of skills or broaden their appreciation of the world around them.

The undergraduate colleges admit freshman and transfer students and offer programs leading to the baccalaureate degree in the arts, sciences, humanities, business, engineering, and music. The College of Liberal Arts and Sciences also provides pre-professional training in the fields of education, law, journalism, and the health sciences. The School of Education offers programs leading to teacher education. The Graduate School offers master's programs in the arts, sciences, humanities, engineering, education, and music to students with baccalaureate degrees.

The School of Architecture and Planning, the Graduate School of Business Administration, and the Graduate School of Public Affairs provide programs leading to master's degrees in their specialized areas. CU-Denver doctoral programs are available in public affairs, education, and applied mathematics. Doctoral work in engineering also is available in cooperation with CU-Boulder. CU-Denver faculty also participates in other doctoral programs offered at CU-Boulder.

A complete listing of bachelor's and master's degree programs offered by CU-Denver is provided in the college and school sections of this catalog. The college and school sections describe specific policies on requirements for graduation, course requirements for various majors, course load policies, course descriptions, and similar information.

CU-Denver has kept pace with the demand for education which leads to improved professional opportunity in the Information Age. Many programs emphasize practical business world applications, and all CU-Denver students are given the opportunity to attain computer literacy. Specific computer-oriented academic programs are offered in the computer science (engineering), applied mathematics (liberal arts and sciences), and information systems (business) programs.

The Future

CU-Denver is committed to the highest standards of education, scholarship, and service to the community. From this commitment springs the vital energy that infuses every campus pursuit. The pace is fast, perhaps unprecedented. Undergraduate studies are at once becoming more and more varied, challenging, and rewarding. CU-Denver is reaching out to all who can benefit from the high quality education it has to offer. New highly innovative applied and professional graduate degrees are being developed that address the emerging needs of the region's economy. Centers for state-of-the-field research at CU-Denver are generating important practical solutions to some of Colorado's and the nation's most serious social, economic, environmental, and technological problems. Throughout history, urban civilization and the arts and humanities have evolved in a rich synergy. CU-Denver — an urban campus — is deeply involved in enriching the cultural milieu of the Denver area. Clearly, the University of Colorado at Denver is on the move.

Accreditation

North Central Association of Colleges and Secondary Schools
American Assembly of Collegiate Schools of Business
Accrediting Commission on Education for Health Services Administration
Colorado State Board of Education
Landscape Architecture Accreditation Board
National Council for the Accreditation of Teacher Education
National Architectural Accrediting Board
See the College of Engineering and Applied Science section of this catalog for the programs accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology
National Association of Schools of Music Planning Accreditation Board
National Association of Schools of Public Affairs and Administration

Auraria Higher Education Center

The Auraria Higher Education Center is the site for the University of Colorado at Denver, Metropolitan State College, and the Community College of Denver. The three institutions share library (which is administered by CU-Denver), classroom, and related facilities on a 171-acre Auraria campus. Certain courses and programs are cooperatively offered.

On the Auraria campus are administrative and classroom buildings, the Auraria Library, the student union, book center, child care and development centers, physical education facilities, science building, and service buildings.

The new buildings share the campus with the reminders of Denver's past— historic Ninth Street Park, restored church buildings, and the Tivoli brewery built in 1882. The Tivoli has been renovated into a complex containing specialty shops, restaurants, and entertainment.

Research and Other Creative Pursuits

CU-Denver is strongly committed to the pursuit of new knowledge through the research efforts of its faculty. It is equally supportive of the other creative endeavors of its faculties in the arts, humanities, and design fields. These achievements not only advance knowledge and enhance the quality of life, but also strengthen teaching by grounding instruction in scholarship and professional practice. In addition, these activities constitute an important component of CU-Denver's service to the community at large. Therefore, funded research is a major priority at CU-Denver.

An important aspect of research and other creative activities at CU-Denver is its multidisciplinary and applied nature. Research in every school and college at CU-Denver addresses questions of great significance for the welfare of Denver and the larger region. Its position within a thriving metropolitan area serves, as well, as a base for exploring topics of national and even international import. But not all research at CU-Denver yields solutions of immediate practical significance. Major efforts now explore topics on the cutting edge of the basic disciplines. These, of course, are carried out within the rich dialogue of scholarship that knows no national bounds. These efforts may yield insights that eventually open the way to practical applications in the next century.

Research projects, training, and public service programs at CU-Denver encompass both traditional and nontraditional fields of study with a focus on issues that relate to city, state, national, and international issues. During 1988-89, CU-Denver faculty and staff received external grants and contracts totaling $8,825,059 for
research, training, and public service programs. All signs point to a steady increase in funded research in the years ahead for CU-Denver. The benefits for the campus will be substantial. Such research assists in sustaining scholarly discourse, enables faculty members to engage in the advancement of knowledge, provides the foundation for solving pressing practical problems of vital concern for society, and enhances the education of students. Many students actively participate in research activities overseen by faculty members. Current externally funded research efforts address a variety of contemporary economic, political, educational, engineering, mathematical, scientific, and environmental needs. Financial support has been obtained for program and service development in the areas of computational mathematics, bilingual and special education, cooperative education, health administration, international affairs, and executive seminars as well as institutes on aging and veterans' employment and training.

Other projects include statewide investigations of economic development, poverty, court-annexed arbitration, air quality and water control, and highway construction. Computer related projects include multilevel algorithms, fast parallel processing, algorithms in linear programming, and modeling. Projects in basic research range from investigations of earthquakes to neurotoxicology to growth equations for sporangiophores.

In addition, a great deal of research at the University goes on without substantial external support. This effort also yields important insights that are conveyed to a national audience through faculty publications, presentations, exhibits, performances, and professional activities. Many members of the faculty are leaders within the national scholarly community. All these pursuits bring recognition to the University, establish the credibility of its faculty, and enhance the value of the degrees it confers.

**CENTERS AND INSTITUTES FOR RESEARCH, SERVICE, AND TRAINING**

**First Amendment Congress**

The mission of the First Amendment Congress is to unite Americans of every persuasion to support freedom of expression, and provide America with a continuing forum to discuss and debate the First Amendment as our cornerstone to liberty. To reach this goal, the Congress sponsors national forums, seminars, and congresses to forge new understanding of First Amendment issues; develops curriculum materials to increase students' understanding of the First Amendment; aids state and local coalitions to develop First Amendment organizations and activities; delivers special messages to various audiences reminding them of their duties to uphold First Amendment freedoms, publishes materials, and researches public attitudes toward media practices; and supports public awareness campaigns on First Amendment issues.

**Center for Health Ethics and Policy**

The Center analyzes and develops constructive courses of action concerning policy and ethics aspects of health-related problems facing Colorado and the nation. The Center's goal is to increase public and private sector attention to these issues and contribute to the making of informed and sound public policy decisions.

**Center for Applied Psychology**

This Center promotes research and educational programs in four areas: public mental health, psychology and the law, psychology and public health, and organizational effectiveness and decision making. The Center represents a cooperative relationship among higher education, government, business, mental health agencies, public health institutions, and the citizenry of the state of Colorado.

**Colorado Principals Center**

The Center is a staff development, renewal, and training center for practicing principals, assistant principals, central office supervisors, and others in instructional leadership positions.

**Colorado Center for Community Development**

The Colorado Center for Community Development provides technical, educational, and applied research assistance to organizations, neighborhoods, and communities that cannot afford or do not have access to professional services. The Center targets its assistance efforts to rural small towns, low income and/or minority communities, and non-traditional, community-based service or development organizations.

**Center for Environmental Sciences**

The Center focuses on interdisciplinary environmental research from among the faculty and staff of CU-Denver. Further, it involves students — especially Master of Environmental Science students — in ongoing research projects. Example projects include Denver-Boulder region brown cloud studies, environmental risk assessments of regional and national issues, and global sulfur cycling research as it relates to greenhouse warming and global climate.

**Center for Urban Transportation Studies**

This Center assumes a leading role in the Rocky Mountain region in developing research and interdisciplinary programs in urban transportation and providing a central resource for information concerning urban transportation problems in the Rocky Mountain region. The Center makes available University expertise to outside organizations.

**Land and Water Information Systems Group**

The Group was created to advance the education and training, research, and public service missions of CU-Denver in the areas of urban and regional information systems, geographic-oriented databases, water resources systems, and built facilities management.

**The Centers — Center for the Improvement of Public Management and Center for Public-Private Sector Cooperation**

Goals are to improve the way the public's business is managed and to engage the public, private, and non-profit sectors in devising solutions to community problems. The Centers offer leadership and management training, do research analyzing problems — explaining policy alternatives and evaluating programs to meet the needs of individual jurisdictions and organizations — and provide conflict management, mediation, and facilitation services.

**Computational Mathematics Group**

The Group brings together researchers whose combined expertise covers the wide range of disciplines required to share computational resources. Its mission is to establish a fertile research environment in which to train Ph.D.s.

**National Leadership Institute on Aging**

The Institute trains leaders to think innovatively, act with greater strategic skills, and forge new public-private, non-profit partnerships in meeting the needs of an aging America. In addition, the Institute provides consulting to organizations involved in designing and delivering programs to meet these needs as well as undertaking policy relevant to research.

**Institute for International Business**

The institute focuses on the global business issues of the 1990s. It is a key
10 / General Information

resource for business and government in
addressing international economic opportunities for Colorado and the U.S. The two
major programs are: The Center for International Executive Education, which gives
U.S. and foreign executives hands-on training in successful international business
practices; and the Center for Research
on Competitiveness, which conducts and
disseminates research on international
business issues.

National Veterans Training Institute
The Institute strengthens, upgrades, and
provides professional skills to the national
network of disabled veterans outreach
programs specialists and local veterans
employment representatives who deliver
services to veterans. The NVfl delivers
various courses and its Resource and
Technical Assistance Center provides
materials and information on veterans
issues to their graduates and others working in service to veterans. The Institute is
operated as a joint effort by CU-Denver
and the Veterans Employment and Training Service of the U.S. Department of
Labor.
4th World Center for the Study of
Indigenous Law and Politics
This Center provides a research clearinghouse to students and faculty at CU.Denver on legal and political issues that
affect indigenous peoples (the 4th World).
In addition to supporting a modest library
of rare books and periodicals on indigenous issues, the Center also stocks
video and audio cassettes on subjects of
indigenous politics, and a substantial
newsfile archive on current developments
in the 4th World. Currently, the Center is
expanding the number of course offerings
in the area of 4th World studies.
Region VIII Resource Access Project
Under a contract funded by the U.S.
Department of Health and Human Services, the Resource Access Project provides training and technical assistance to
HeadStart centers throug hout a six-state
region.
Center for Research in Rhetoric
The Center conducts original and
applied research in rhetoric, broadly
conceived, and engages in projects that
involve faculty and students who carry
out research studies that contribute to our
understanding of rhetoric and discourse in
the broad realm of human affairs. Reports
presenting the results of research projects
are published by the Center and are available in the English department office.

The University reserves the right to
change documents / credentials deadlines
in accordance with enrollment demands.
Applicants should apply as early as
possible. Updated information is available
from the Office of Admissions (303)
55~2704 . For an applicant to be considered for a specific term, ALL documents
required for admission must be received
by the Office of Admissions by the
DEADLINE for that term. Applicants who
are unable to meet the deadline may elect
to have admission consideration made for
a later term. Transfer students are
reminded that sufficient time should be
allowed to have transcripts sent from
institutions attended previously. Foreign
students are advised that it usually takes
120 days for credentials to reach the
Office of Admissions from international
locations.

ADMISSION POLICIES
AND PROCEDURES
All questions and correspondence
regarding admission to CU-Denver and
requests for application forms should be
directed to:
Office of Admissions and Records
University of Colorado at Denver
1200 Larimer St.
Denver, CO 80204
(303) 55~2704

General Policies
CU-Denver seeks to identify applicants
who are likely to complete an academic
program successfully. Admission decisions
are based on many factors, the most
important being:
l. Level of previous academic
performance.
2. Evidence of academic ability and
accomplishment, as indicated by scores
on national aptitude tests.
3. Evidence of maturity, motivation,
and potential for academic success.
CU-Denver reserves the right to deny
admission to new applicants or readmission to former students whose total
credentials indicate an inability to assume
those obligations of performance and
behavior deemed essential by the University in order to carry out its lawful missions, processes, and functions as an
educational institution.
Applicants who request degree programs unavailable at CU-Denver will be
considered for admission to the College of
Liberal Arts and Sciences with an undetermined major. Students admitted with an
undetermined major are expected to
declare a major by the time they have 60
hours toward graduation completed.

ADMISSION REQUIREMENTS FOR
FRESHMEN
New freshmen may apply for admission
to the Colleges of Business and
Administration, Engineering and Applied
Science, or Liberal Arts and Sciences.
General Requirements. The applicant
must be a high school graduate or have
been awarded a High School Equivalency
Certificate by completing the General
Education Development (GED) Test.

Specific College Requirements:
College of Business and Administration
English (one year of speech/ debate and
two years of composition are strongly
recommended) ..... . ... . . . ... . .. . .. 4
Mathematics (including at least two years
of algebra and one year of geometry) ... 4
Natural sciences Oaboratory science) . .. . 2
Social sciences (including history) .. .. .. 2
Foreign language (both units in a single
language) ... . . . . . . . . . . . . .. .... . . . . 2

Admission of Undergraduate
Degree Students

RECEIPT OF DOCUMENTS DEADLINES
Undergraduate
Students
New Students
Transfer Students
Former University of Colorado Students
lntrauniversity Transfer Students
International Students
Undergraduate:
Graduate:

Fall
1990
July 22
July 22
July 22
60 days prior to

July 22
May 26

Spring
1991
Dec. 1
Dec. 1
Dec. 1
the beginning of

Dec. 1
Oct. 27

Summer
1991
May 3
May 3
May 3
the term

May 3
March 10


Academic electives .................................. 2
(Additional courses in English, foreign language, mathematics, natural or social sciences, not to include business courses.)
Total .................................................. 16

College of Engineering and Applied Science

English (literature, composition, grammar) ........................................... 4
Mathematics distributed as follows:
   Algebra .................................................. 2
   Geometry .................................................. 1
   Additional mathematics (trigonometry recommended) ......................... 1
Natural sciences including one year of physics and one year of chemistry ... 2
Foreign language (both units in a single language) ................................. 2
Academic electives ............................................................................. 3
Total .................................................. 16

College of Liberal Arts and Sciences

English (literature, composition, grammar) ........................................... 4
Mathematics (excluding business and consumer mathematics) ................. 3
Natural sciences ................................................................................. 3
Social science .................................................................................. 2
Foreign language (both units in a single language) ................................. 2
Academic elective ............................................................................... 1
Total .................................................. 15

All music majors in the School of the Arts are expected to have previous experience in an applied music area. Two years of piano training are recommended.

An audition is required of all entering freshmen and undergraduate transfer students. Applicants may substitute tape recordings (about 10 minutes in length) and a statement of excellence from a qualified teacher in lieu of the personal audition. Interested students should write to the School of the Arts, CU-Denver, for audition information and applications.

Beginning in the Fall Semester of 1988, freshmen entering the University of Colorado are required to meet the following University-wide minimum academic preparation: 4 years of English (with emphasis on composition), 3 years of college preparatory mathematics (excluding business and consumer mathematics), 3 years of natural science including one year of U.S. or world history, and 2 years of a single foreign language.

MINIMUM ACADEMIC PREPARATION STANDARDS (MAPS)

Success in undergraduate study is directly related to high school preparation. Sufficiently prepared students have a better probability of success. The MAPS focus on what the student has studied in preparation for college. Freshman admission standards define the level of success and achievement necessary to be admitted to the University of Colorado and include factors that predict academic success such as scores on the ACT or SAT, high school course work, and the grade-point average. Both what the student has studied and how the student has achieved will be factors that determine admission to the University.

Students with MAPS deficiencies may be admitted to the University provided they meet the other admission standards (e.g., test scores, rank in high school class, grade-point average) and provided they make up any deficiencies in the MAPS prior to graduation from the University.

Two levels of deficiency will be recognized.

1. One unit of deficiency will be allowed provided the student meets other standards of the University (e.g., test scores, class rank) and provided the student makes up the deficiency before graduation.Credits so taken will count toward graduation provided the CU college normally accepts those course credits toward graduation.

2. In some cases, a student having more than one unit of deficiency may be admitted, provided that the student meets other standards of the University. The student must make up additional deficiencies before graduation by taking an expanded program of studies. The student may satisfy the MAPS requirements either by 1) courses taken at CU, 2) courses taken at other institutions of higher education, 3) completion of additional high school credits, 4) credit-by-examination programs, or 5) other ways as approved by each college.

All applicants who meet the above MAPS requirements are classified in two ways for admission purposes:

1. Preferred consideration is given to applicants who rank in the top 30% of their high school graduating class and have a composite score of 25 or higher on the American College Test (ACT), or a combined score of 1050 or higher on the Scholastic Aptitude Test (SAT). Business applicants will receive preferred consideration if they graduated in the top 25 percent of their high school class and achieved a composite score of at least 25 on the ACT or 1050 on the SAT. Engineering applicants will receive preferred consideration if they graduated in the top 20 percent of their high school class and achieved a composite score of at least 26 on the ACT and a 28 on the mathematics or a 1100 total on the SAT with a 600 on the mathematics. Applicants who do not meet the admissions requirements for direct admission to Engineering are encouraged to apply as a pre-engineering major in the College of Liberal Arts and Sciences. Music major applicants also must successfully pass a music audition.

2. Applicants who rank in the lower 70% of their high school graduating class, and/or have combined SAT scores below 1050 or a composite ACT score below 25, and/or do not have 15 units of acceptable high school credit are reviewed on an individual basis.

How to Apply

1. Students should obtain an application for undergraduate admission from a Colorado high school counselor or from the CU-Denver Office of Admissions Processing.

2. The application must be completed in full and sent to the Office of Admissions Processing with a $30 (subject to change) non-refundable fee. For applicants who are granted admission but are unable to enroll for that term, the $30 application fee will remain valid for 12 months. Provided the Office of Admissions Processing is informed of the intent to enroll for a later term.

3. Students are required to have their high school send an official transcript of their high school grades, including class rank, to the Office of Admissions Processing. Official transcripts are those sent by the issuing institution directly to the CU-Denver Office of Admissions Processing. Hand-carried copies are not official.

4. Students who did not graduate from high school are required to have a copy of their GED test scores and GED certificate sent from the certifying agency to the CU-Denver Office of Admissions Processing.

5. Students also are required to take either the American College Test (ACT) or the Scholastic Aptitude Test (SAT) and to request that test scores be sent to CU-Denver (ACT code 0533 or SAT code 4-4875). High school students may obtain information about when and where these tests are administered by contacting their counselors.
Applicants who took one of these tests and did not designate CU-Denver to receive scores must request the testing agency to send scores to CU-Denver. Complete a Request for Additional Score Report at test centers or from the offices listed below.

- Registration Department
  - American College Testing Program (ACT)
    - PO. Box 414
    - Iowa City, Iowa 52240
  - College Entrance Examination Board (SAT)
    - PO. Box 592
    - Princeton, New Jersey 08540
  - PO. Box 1025
  - Berkeley, California 94704

6. International students must submit proof of language proficiency (see Requirements for International Students).

All credentials presented for admission become the property of the University of Colorado and must remain on file.

ADMISSION REQUIREMENTS FOR TRANSFER STUDENTS

Transfer students may apply for admission to the Colleges of Business and Administration, Engineering and Applied Science, and Liberal Arts and Sciences. Students interested in the field of education should contact the School of Education office for information (556-2717).

Minimum admissions standards have been developed for all public four-year institutions in Colorado. However, transfer applicants who meet these standards are not guaranteed admission. They also must meet the admissions standards of the University of Colorado and its individual colleges. To meet the minimum standards at the University of Colorado at Denver, students must meet one of the following conditions:

1. Have earned fewer than 30 collegiate semester hours and meet the first-time FRESHMAN standards for the institution.

2. Have earned 12-29 collegiate semester credit hours and have the following grade-point average:
   a. 2.0 GPA if transferring from Colorado School of Mines, Colorado State University, University of Colorado at Boulder, University of Colorado at Colorado Springs, or the University of Northern Colorado.
   b. 2.5 GPA if transferring from any other postsecondary institution.

3. Be enrolled in a CCHE-approved guaranteed transfer agreement and meet the minimum academic qualifications of the agreement.

Transfer students are given priority consideration for admission as follows:

1. College of Business and Administration. To be considered for new transfer admission, students must have completed at least 24 semester hours which will apply to the degree, Bachelor of Science (Business Administration). Applicants with an overall GPA of 3.0 in applicable course work will be automatically admitted.

2. Transfer students are given priority consideration for admission as follows:

   a. 2.5 GPA if transferring from any other postsecondary institution.
   b. 2.0 cumulative college grade-point average, but with a 3.25 in the last 24 semester hours of applicable course work attempted, will be automatically admitted.

   Applicants with at least a 2.6 in applicable course work in the last 24 semester hours will be considered as space is available. Students with less than a 2.6 GPA in the last 24 semester hours of applicable course work will be referred to the College of Liberal Arts and Sciences for admission consideration.

   No applicant will be accepted who is not eligible to return to all institutions previously attended.

2. College of Engineering and Applied Science. Applicants to the College of Engineering and Applied Science should have at least a 2.75 cumulative grade-point average (on a 4.0 scale) for all work attempted, should have completed two semesters each of calculus and physics, and must be eligible to return to all institutions previously attended.

3. College of Liberal Arts and Sciences. Transfer applicants must have at least a 2.0 cumulative college grade-point average (on a 4.0 scale) for all work attempted and must be eligible to return to all institutions previously attended. Course work in progress cannot be used in calculating the cumulative average. Music major applicants also must pass an audition. Contact the School of the Arts for audition information (556-2727).

   Important Note: Applicants who do not meet the above grade-point average or credit hour requirements will still be considered for admission, but on an individual basis.

   The primary factors used when considering students individually are (1) probability of success in the academic program to which admission is desired; (2) the quality of prior academic work; (3) age, maturity, and noncollegiate achievements; and (4) time elapsed since last attendance at previous colleges.

How to Apply

1. The student should obtain a transfer application from the CU-Denver Office of Admissions Processing.

2. The application form must be completed and returned with the required $30 (subject to change) nonrefundable application fee.

3. The student is required to have two official transcripts sent to the Office of Admissions Processing from each college attended. Official transcripts are those sent by the issuing institution directly to the CU-Denver Office of Admissions Processing. Hand-carried copies are not official. If a student is currently enrolled at another institution, an incomplete transcript listing all courses except those taken in the final term should be sent. Another transcript must be submitted after completion of the final term. (Transcripts from foreign institutions must be presented in the original language and accompanied by a certified literal English translation.)

4. Students who have attended a two-year school or community college and were enrolled in the Guaranteed Transfer Program to transfer to CU-Denver, should submit a copy of the Guaranteed Transfer Agreement with their application.

   Liberal arts and music major applicants with fewer than 12 semester hours (18 quarter hours) of college work completed must also submit a high school transcript and ACT or SAT test scores.

   Engineering applicants with fewer than 24 semester hours also must submit high school transcripts and ACT/SAT scores.

   Business applicants with fewer than 24 semester hours also must submit high school transcripts and ACT/SAT scores.

   Applicants to the College of Liberal Arts and Sciences should be aware that the College requires elementary proficiency in a foreign language for graduation.

   Applicants to the College have fulfilled this requirement if they have completed three years of any classical or modern foreign language in high school and present a high school transcript to the College Advising Office for verification. For further information, students should contact the College Advising Office, 556-2555.

All credentials presented for admission become the property of the University of Colorado and must remain on file. Students
who do not declare all previously attended institutions are subject to disciplinary action and/or dismissal.

Transfer of College-Level Credit

After all official transcripts have been received and the applicant has been admitted as a degree student, the Office of Admissions Processing and the appropriate academic unit will determine which courses taken at other institutions can be applied to a degree program at CU-Denver. In general, transfer credit will be accepted insofar as it meets the degree and grade requirements at CU-Denver.

College-level credit may be transferred to the University if it was earned at a college or university of recognized standing, by CLEP or advanced placement examinations, or in military service or schooling as recommended by the Commission on Accreditation of Service Experiences of the American Council on Education; if a grade of C- or higher was attained; and if the credit is for courses appropriate to the degree sought at this institution. Courses taken pass/fail are transferred when a grade of C- or higher is required to pass.

The University may accept a maximum of 72 semester credits (108 quarter hours) of work from a two-year institution toward the baccalaureate degree requirements and may accept up to 112 semester credits (153 quarter hours) from a four-year college or university. No credit is allowed for vocational/technical, remedial, or religious/doctrinal work. A maximum of 60 semester credits of extension and correspondence work (not to include more than 30 semester credits of correspondence) may be included if the above conditions are met.

The College of Business and Administration generally limits its transfer credit for business courses taken at the lower division level. All courses in the area of emphasis must be taken at the University of Colorado. A maximum of 60 semester hours (90 quarter hours) of work from a two-year institution may be applied toward baccalaureate degree requirements. All correspondence courses are evaluated to determine their acceptability, and business courses may not be taken through correspondence.

The College of Engineering and Applied Science, in general, requires that engineering course transfer credit must come from an ABET accredited engineering program to be acceptable for degree purposes. Engineering technology courses are not considered equivalent to engineering courses.

Readmission Requirements for Former and Returning CU Students

CU-Denver students who have not registered and attended classes at CU-Denver for one year or longer, and who have not attended another institution since CU, are returning students and must formally apply for readmission. Application forms are available at the Office of Admissions.

Former students who have attended another college or university since last attending the University of Colorado must apply as transfer students and meet the transfer student deadlines for receipt of documents. This requires payment of the $30 (subject to change) non-refundable application fee and submission of official transcripts from all colleges and universities previously attended. Transcripts must be sent directly from the issuing institution to CU-Denver, Admissions Processing, 1200 Larimer St., Denver, CO 80204.

Students who last attended less than one year ago but attended another college or university during the interim are required to pay a $30 (subject to change) transfer application fee. Transcripts must be requested by the student and sent by the registrar of the other institution(s) to CU-Denver, Admissions Processing, 1200 Larimer St., Denver, CO 80204.

Students who last attended another CU campus (including the Division of Extended Studies) must formally apply for readmission. Application forms are available from the Office of Admissions Processing.

Admission Requirements for International Students

The University of Colorado at Denver encourages international students to apply for admission to undergraduate and graduate programs.

Undergraduate: Admission requirements for CU-Denver’s schools and colleges vary, and international students seeking admission must meet the requirements of the program to which they are applying. In addition, all international students whose first language is not English are required to have a minimum TOEFL (Test of English as a Foreign Language) score of 525. Prospective students should request an International Student Application packet from the Office of Admissions. Information about requirements for each college and school can be found in this catalog.

Deadlines for receipt of documents have been established to allow for the timely mailings of I-20’s. Contact the Office of Admissions for these dates.

Graduate: International students who wish to pursue graduate study at CU-Denver must have earned an undergraduate bachelor’s degree, or its equivalent, and must fulfill all other requirements of the graduate program to which they are applying. Applications are available from The Graduate School six months prior to the term for which the student is applying.

Note: Except for summer terms, international students must be in a degree-seeking status. They may attend summer terms as non-degree students. This exception is strictly limited to summer terms.

CU-Denver Intra-university Transfer or Change of Campus (including Extended Studies)

CU-Denver students may change colleges or schools within CU-Denver provided they are accepted by the college or school to which they wish to transfer. CU-Denver Intra-university Transfer Forms may be obtained from the Office of Admissions. Students should observe application deadlines indicated in the current Schedule of Classes. Decisions on intra-university transfers are made by the college or school to which the student wishes to transfer.

CU-Denver students may change University of Colorado campuses by applying directly to the Admissions Processing Office of the campus to which they wish to transfer. Change of Campus applications and deadline information also must be obtained from the campus to which the student is applying.

Extended Studies students wishing to enroll in regular CU-Denver courses or degree programs should contact the Office of Admissions Processing.

High School Concurrent Enrollment

High school juniors and seniors with proven academic abilities may be admitted to CU-Denver with special approval for one term only. This approval may be renewed. Credit for courses taken may subsequently be applied toward a University degree program. For more information and application instructions, contact the CU-Denver Office of Admissions Processing (303-556-2704).
Admission of Graduate Degree Students

All correspondence and questions regarding admission to the graduate program at CU-Denver should be directed to the following:

Programs in Business
Graduate Business Programs
Graduate School of Business Administration
595-4007

Programs in Architecture and Planning
School of Architecture and Planning
556-3382

Programs in Public Affairs
Graduate School of Public Affairs
556-2825

All Other Programs
The Graduate School
556-2663

GRADUATE PROGRAMS

As a principal part of its mission, CU-Denver offers graduate and professional-level programs and during the 1989-90 academic year, approximately 44 percent of the student body was enrolled at the graduate level.

Graduate degree programs are offered through The Graduate School by its member schools and colleges (School of Education, College of Engineering and Applied Science, and College of Liberal Arts and Sciences), and outside The Graduate School by the Graduate School of Business Administration, the School of Architecture and Planning, and the Graduate School of Public Affairs. The particular admission and graduation requirements established by each of these academic units are detailed in the following sections of this catalog.

GRADUATE ADMISSION REQUIREMENTS AND APPLICATION DEADLINES

Admission requirements and application deadlines vary according to the individual graduate program. The Graduate School has general admission requirements which are supplemented by specific requirements of the major departments of graduate study (e.g., electrical engineering, education, English, etc.). Applicants should consult the general information section of The Graduate School portion of this catalog as well as the college or school sections for requirements and deadlines for specific programs.

Admission of Non-Degree Students

Persons who have reached the age of twenty are eligible to enter a degree program and who want to take University courses but do not plan to work toward a University of Colorado degree at this time may be admitted as non-degree students.

Correspondence and questions regarding admission as a non-degree student should be directed to the Office of Admissions Processing. Those seeking admission as non-degree students for the purpose of teacher certification should contact the School of Education, 556-2717. Each school/college limits the number of semester hours transferable toward a degree program.

Students considering changing from non-degree to degree status should contact the school/college to which they will be applying (as a degree student) for information about the number of hours which may be taken as a non-degree student.

Courses taken as a non-degree student are for credit and can be used for transfer to other institutions or for professional improvement.

Note: International students are not admitted as non-degree students, except for summer terms. They must hold a valid Visa.

Students with the baccalaureate degree who are not accepted to specific degree programs may enroll for course work as non-degree students. There are several types of these students. Among them are teachers who seek renewal of certification; students who have attained the degree or credential status they want, but who wish to take additional course work for professional or personal improvement; and students who feel a need to make up deficiencies before entering a specific program.

Non-degree students should be aware that generally only a limited number of course credits taken by a non-degree student may be applied later toward a degree program at CU-Denver.

To permit continuing registration as a non-degree student, a minimum grade-point average of 2.0 must be maintained.

Note: International students are not admitted as non-degree students, except for summer terms.

Non-degree students must maintain a grade-point average of 2.0 at CU-Denver.

HOW TO APPLY FOR NON-DEGREE STUDENT ADMISSION

To apply for admission as a non-degree student, obtain a Non-Degree Student Application form from the Office of Admissions Processing. Return completed application by the deadline for the term desired. A $10 (subject to change) nonrefundable application fee is required.

No additional credentials are required.

Applicants who seek teacher certification must apply separately to the School of Education and submit the required credentials. Non-degree students are advised that registration for courses is on a space available basis.

CHANGING STATUS FROM NON-DEGREE TO DEGREE STUDENT

Non-degree students may apply for admission to an undergraduate degree program by following the instructions outlined in the Non-degree to Degree procedures available from the Office of Admissions. Academic credentials (i.e., transcripts and/or test scores) and a $30 (subject to change) nonrefundable application fee also must be submitted.

Non-degree students who are accepted as undergraduate degree students may generally transfer a limited number of semester hours for courses taken as a non-degree student to an undergraduate degree program, with the approval of their academic dean. Non-degree students should consult with the college to which they are applying during the first semester of their enrollment for the maximum number of semester credit hours acceptable toward a degree program as a non-degree student. (Students enrolled as non-degree students prior to the Fall Semester of 1970 are subject to the policies in effect between January of 1969 and August of 1970.)

Non-degree students may apply for admission to a graduate program by completing the application required by the particular program. The graduate dean, upon recommendation by the department, may accept up to 8 semester hours of credit toward the requirements for a master's degree for courses taken as a non-degree student at the University or at another recognized graduate school, or some combination thereof. The department may recommend acceptance of additional credit for courses taken as a non-degree student during the semester the student has applied for admission to the desired degree program.
Official Notification of Admission

Official notification of admission to CU-Denver as an undergraduate, graduate, or non-degree student is provided by the Office of Admissions Processing. Letters from various schools and colleges indicating acceptance into a particular program are pending subject to official notification of admission to the institution. Applicants who do not receive official notification of admission within a reasonable period of time (approximately 3 weeks) after submitting all application materials should contact the Office of Admissions Processing (303) 556-2704.

Tentative Admission. Students who are admitted pending receipt of additional documents will be permitted one term to submit the documents. If temporarily waived official documents are not received by the end of the initial term of attendance, registration for subsequent terms will be denied.
<table>
<thead>
<tr>
<th>Type of Applicant</th>
<th>Criteria for Admission</th>
<th>Required Credentials</th>
<th>When to Apply</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FRESHMAN</strong></td>
<td></td>
<td></td>
<td></td>
<td>For specific requirements refer to the college sections of this bulletin. For example: Music requires an audition.</td>
</tr>
<tr>
<td>(Student seeking bachelor’s degree who has never attended a collegiate institution)</td>
<td>Complete application</td>
<td>$30 applicable fee Official high school transcript showing rank-in-class, date of graduation, 6th semester grades, courses in progress Official ACT or SAT score report</td>
<td>Not later than: July 22 for fall Dec. 1 for spring May 3 for summer Seniors who meet or exceed all admission criteria may apply as early as Oct. 1 for following fall.</td>
<td></td>
</tr>
<tr>
<td><strong>TRANSFER</strong></td>
<td></td>
<td></td>
<td></td>
<td>Liberal Arts and Music transfers with fewer than 33 sem. hrs. of college work. Business transfers with fewer than 24 sem. hrs. and Engineering transfers with fewer than 24 sem. hrs. must also submit all freshman credentials.</td>
</tr>
<tr>
<td>(Student seeking a bachelor’s degree who has attended a collegiate institution other than CU)</td>
<td>Complete application</td>
<td>$30 application fee Two official transcripts sent from each college attended</td>
<td>Not later than: July 22 for fall Dec. 1 for spring May 3 for summer</td>
<td></td>
</tr>
<tr>
<td><strong>NON-DEGREE</strong></td>
<td></td>
<td></td>
<td></td>
<td>Non-degree students who have earned a bachelor’s degree should see Graduate School section for additional information.</td>
</tr>
<tr>
<td>(Student is not seeking a degree at this institution)</td>
<td>Complete application</td>
<td>$10 application fee</td>
<td>Not later than: July 22 for fall Dec. 1 for spring May 3 for summer</td>
<td></td>
</tr>
<tr>
<td><strong>RETURNING CU STUDENT</strong></td>
<td></td>
<td></td>
<td></td>
<td>Will be admitted to their previous major unless a different major is requested. Students under academic suspension in certain schools or colleges at the University of Colorado may enroll during the summer terms to improve their grade-point averages.</td>
</tr>
<tr>
<td>(Returning non-degree and/or degree student who has not attended another institution since CU)</td>
<td>Complete degree</td>
<td></td>
<td>Not later than: July 22 for fall Dec. 1 for spring May 3 for summer</td>
<td></td>
</tr>
<tr>
<td><strong>FORMER CU STUDENT</strong></td>
<td></td>
<td></td>
<td></td>
<td>Will be admitted to previous major unless a different major is requested on application.</td>
</tr>
<tr>
<td>(Degree student who has attended another institution since attending CU)</td>
<td>Same as for transfer</td>
<td>Completed degree</td>
<td>Not later than: July 22 for fall Dec. 1 for spring May 3 for summer</td>
<td></td>
</tr>
<tr>
<td><strong>CHANGE OF STATUS: NON-DEGREE TO DEGREE</strong></td>
<td>Same as for transfer</td>
<td>Complete application $30 application fee Two official transcripts from each intervening college</td>
<td>Not later than: July 22 for fall Dec. 1 for spring May 3 for summer</td>
<td></td>
</tr>
<tr>
<td>(CU undergraduate student who wishes to enter a degree program)</td>
<td>Non-degree student application</td>
<td>$10 application fee</td>
<td>Not later than: July 22 for fall Dec. 1 for spring May 3 for summer</td>
<td>Only students who have completed and received degrees are eligible to change to non-degree status.</td>
</tr>
<tr>
<td><strong>CHANGE OF STATUS: DEGREE TO NON-DEGREE</strong></td>
<td>Must have completed degree</td>
<td>Non-degree student application</td>
<td>Not later than: July 22 for fall Dec. 1 for spring May 3 for summer</td>
<td></td>
</tr>
<tr>
<td>(Former CU degree student who has graduated and wishes to take additional work)</td>
<td>Completed degree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>INTERCAMPS TRANSFER</strong></td>
<td></td>
<td></td>
<td></td>
<td>Transfers from Denver to another campus of CU should refer to the bulletin for the campus to which they are applying for additional requirements. Will be admitted to previous major unless a different major is requested on application.</td>
</tr>
<tr>
<td>(Student who has been enrolled on one CU campus and wishes to take courses on another)</td>
<td>Transfer to Denver, not later than: July 22 for fall Dec. 1 for spring May 3 for summer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>INTRAUNIVERSITY TRANSFER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Students who wish to change from one CU college to another, e.g., from the College of Liberal Arts and Sciences to the College of Business)</td>
<td>Same as for transfer</td>
<td>Intrauniversity transfer application CU transcript</td>
<td>60 days prior to the beginning of the term</td>
<td></td>
</tr>
</tbody>
</table>

1. Requirements for individual schools or colleges may vary.
2. Foreign students should see International Students in the Admissions section of this catalog.
3. Applicants who have earned 12-29 semester hours must meet freshman standards or have a minimum transfer GPA of 2.5. (Applicants transferring from Colorado School of Mines, CSU, UNC, UCB, or UCCS must have a minimum transfer GPA of 2.0.)
TUITION AND FEES

General Information

All tuition and fee charges are established by the Board of Regents, the governing body of the University of Colorado, in accordance with legislation enacted annually (usually in the spring) by the Colorado General Assembly. The Regents reserve the right to change tuition and fee rates at any time. A tuition schedule is published prior to registration for each term, and students should contact the Records Office for further information on the tuition and fee charges for a particular term. The following rates are for the 1989-90 academic year and are provided to assist prospective students in anticipating cost.

Other Fees

1. Student Activity Fee (required for all students):
   For each term .................. $ 27.00
   This fee supports the activities of the student government and helps provide legal services, recreational activities, student health services, the student newspaper, the Center for Student Development Services, and various student organizations. The fee is approved by student referendum and is required of all students at the University of Colorado at Denver. (The fee includes a Student Health fee.)

2. Auralia Bond Retirement Fee
   (required for all students):
   Each term ..................... $ 19.00

3. Student Information System Fee (a non-refundable fee required of all students each term) .................. $ 5.00

4. Matriculation Fee (mandatory for the first term for all new students):
   .............................................. $ 15.00
   This is a non-refundable fee charged at the student’s first registration to cover costs of generating transcripts.

5. Health Insurance Fee (mandatory, but may be waived):
   Fall semester ..................... $ 228.00
   Spring semester (includes summer) .................................. $ 228.00
   Summer term only ................ $115.00

   Students who wish to waive student health insurance coverage must complete and submit a waiver card to the Bursar’s Office before the end of the drop/add period.

6. Doctoral dissertation fee (mandatory for all students certified by The Graduate School for enrollment): Students should contact The Graduate School for guidelines established for charges for enrollment.

7. Comprehensive examination fee: Any student in The Graduate School, the Graduate School of Business Administration, or Graduate School of Public Affairs must be enrolled during the term in which the Comprehensive Examination for a master’s degree is completed.

8. Laboratory breakage fee (mandatory for students enrolled in a chemistry laboratory course):
   Breakage deposit ................ $ 20.00
   An $8 deduction is assessed for expendable items. The unused portion is returned at the end of the semester.

9. Music laboratory fee (mandatory for music majors and others enrolled in certain music courses):
   Music fee .......................... $ 24.00
   Music majors and others enrolled in piano, sound recording and reinforcement, and electronic music must pay this fee. No student is charged more than one $24 fee during a given term.

10. South African Scholarship Fund. The Regents have authorized the University of Colorado to accept voluntary student contributions of $1.00 per student per semester to be dedicated to scholarship and bursaries for the higher education of needy South African students at South African universities or at the University of Colorado. Students who wish to contribute to this fund should submit a contribution card to the Bursar’s Office before the end of the drop/add period each semester.

The insurance program primarily subsidizes major medical expenses according to the schedule of benefits stated in the insurance brochure, which may be obtained from the Insurance Coordinator. Dependent coverage (spouse and/or children) also is available at an additional charge. Further information on health insurance is available from the Insurance Coordinator, NC 1501, 556-8495.

6. Doctoral dissertation fee (mandatory for all students certified by The Graduate School for enrollment): Students should contact The Graduate School for guidelines established for charges for enrollment.

7. Comprehensive examination fee: Any student in The Graduate School, the Graduate School of Business Administration, or Graduate School of Public Affairs must be enrolled during the term in which the Comprehensive Examination for a master’s degree is completed.

8. Laboratory breakage fee (mandatory for students enrolled in a chemistry laboratory course):
   Breakage deposit ................ $ 20.00
   An $8 deduction is assessed for expendable items. The unused portion is returned at the end of the semester.

9. Music laboratory fee (mandatory for music majors and others enrolled in certain music courses):
   Music fee .......................... $ 24.00
   Music majors and others enrolled in piano, sound recording and reinforcement, and electronic music must pay this fee. No student is charged more than one $24 fee during a given term.

10. South African Scholarship Fund. The Regents have authorized the University of Colorado to accept voluntary student contributions of $1.00 per student per semester to be dedicated to scholarship and bursaries for the higher education of needy South African students at South African universities or at the University of Colorado. Students who wish to contribute to this fund should submit a contribution card to the Bursar’s Office before the end of the drop/add period each semester.

Payment of Tuition and Fees

All tuition and fees (except the application fee) are assessed and payable when the student registers for the term, according to guidelines in the current Schedule of Classes. Students who register for 7 or more credit hours may arrange at the time of registration to defer payment of part of the charges. Specific information on deferred payment is included in the Schedule of Classes published before each semester or summer term. Students who fail to complete payment by the published deadlines, or who fail to file the required promissory note, will be assessed a $50 penalty.

Students who register for courses are liable for payment of tuition and fees even though they may drop out of school. Refund policies for students who withdraw from the University are included in the Schedule of Classes. A student with financial obligations to the University will not be permitted to register for any subsequent term, to be graduated, to be issued transcripts, or to be listed among those receiving a degree or special certificate. The only exception to this regulation involves loans and other types of indebtedness which are due after graduation.

Personal checks are accepted for any University obligation. Any student who pays with a check that is not acceptable to the bank will be charged an additional service charge. Students may pay tuition and fees by credit card.

Tuition Appeals

Exceptions to financial obligations incurred may be granted by the Tuition Appeals Committee. The Committee will only consider appeals when a student has been medically disabled, has experienced a death in the family, or has a change in employment hours or location beyond the student’s control. Documentation of these conditions will be required. Exceptions will not be considered for a student’s failure to comply with published deadlines, or changes in employment under the student’s control.

Please note: tuition appeals must be filed within four months of the end of the term for which the appeal is filed.
## FALL AND SPRING 1989-90 TUITION

### UNDERGRADUATE DEGREE STUDENTS IN THE COLLEGE OF LIBERAL ARTS AND SCIENCES and non-degree students without an undergraduate degree

<table>
<thead>
<tr>
<th>Credit Hrs.</th>
<th>Resident</th>
<th>Non-resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>$ 81</td>
<td>$ 364</td>
</tr>
<tr>
<td>2</td>
<td>162</td>
<td>728</td>
</tr>
<tr>
<td>3</td>
<td>243</td>
<td>1,092</td>
</tr>
<tr>
<td>4</td>
<td>324</td>
<td>1,456</td>
</tr>
<tr>
<td>5</td>
<td>405</td>
<td>1,820</td>
</tr>
<tr>
<td>6</td>
<td>486</td>
<td>2,184</td>
</tr>
<tr>
<td>7</td>
<td>567</td>
<td>3,035</td>
</tr>
<tr>
<td>8</td>
<td>648</td>
<td>3,035</td>
</tr>
<tr>
<td>9-15</td>
<td>678</td>
<td>3,035</td>
</tr>
</tbody>
</table>

Each credit hour over 15

### UNDERGRADUATE DEGREE STUDENTS IN THE COLLEGE OF BUSINESS AND THE COLLEGE OF ENGINEERING

<table>
<thead>
<tr>
<th>Credit Hrs.</th>
<th>Resident</th>
<th>Non-resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>$ 95</td>
<td>$ 379</td>
</tr>
<tr>
<td>2</td>
<td>190</td>
<td>758</td>
</tr>
<tr>
<td>3</td>
<td>285</td>
<td>1,137</td>
</tr>
<tr>
<td>4</td>
<td>380</td>
<td>1,516</td>
</tr>
<tr>
<td>5</td>
<td>475</td>
<td>1,895</td>
</tr>
<tr>
<td>6</td>
<td>570</td>
<td>2,274</td>
</tr>
<tr>
<td>7</td>
<td>665</td>
<td>3,159</td>
</tr>
<tr>
<td>8</td>
<td>760</td>
<td>3,159</td>
</tr>
<tr>
<td>9-15</td>
<td>888</td>
<td>3,159</td>
</tr>
</tbody>
</table>

Each credit hour over 15

### GRADUATE DEGREE STUDENTS: with programs in the School of Architecture and Planning and NON-DEGREE graduate students and non-Denver campus programs

<table>
<thead>
<tr>
<th>Credit Hrs.</th>
<th>Resident</th>
<th>Non-resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>$115</td>
<td>$383</td>
</tr>
<tr>
<td>2</td>
<td>230</td>
<td>766</td>
</tr>
<tr>
<td>3</td>
<td>345</td>
<td>1,149</td>
</tr>
<tr>
<td>4</td>
<td>460</td>
<td>1,532</td>
</tr>
<tr>
<td>5</td>
<td>575</td>
<td>1,915</td>
</tr>
<tr>
<td>6</td>
<td>690</td>
<td>2,298</td>
</tr>
<tr>
<td>7</td>
<td>805</td>
<td>3,195</td>
</tr>
<tr>
<td>8</td>
<td>920</td>
<td>3,195</td>
</tr>
<tr>
<td>9-15</td>
<td>956</td>
<td>3,195</td>
</tr>
</tbody>
</table>

Each credit hour over 15

### GRADUATE DEGREE STUDENTS: in the Graduate School of Business Administration

<table>
<thead>
<tr>
<th>Credit Hrs.</th>
<th>Resident</th>
<th>Non-resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>$139</td>
<td>$401</td>
</tr>
<tr>
<td>2</td>
<td>278</td>
<td>802</td>
</tr>
<tr>
<td>3</td>
<td>417</td>
<td>1,203</td>
</tr>
<tr>
<td>4</td>
<td>556</td>
<td>1,604</td>
</tr>
<tr>
<td>5</td>
<td>695</td>
<td>2,005</td>
</tr>
<tr>
<td>6</td>
<td>834</td>
<td>2,406</td>
</tr>
<tr>
<td>7</td>
<td>973</td>
<td>3,342</td>
</tr>
<tr>
<td>8</td>
<td>1,112</td>
<td>3,342</td>
</tr>
<tr>
<td>9-15</td>
<td>1,157</td>
<td>3,342</td>
</tr>
</tbody>
</table>

Each credit hour over 15

### GRADUATE DEGREE STUDENTS: in the School of Education

<table>
<thead>
<tr>
<th>Credit Hrs.</th>
<th>Resident</th>
<th>Non-resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>$120</td>
<td>$401</td>
</tr>
<tr>
<td>2</td>
<td>240</td>
<td>802</td>
</tr>
<tr>
<td>3</td>
<td>360</td>
<td>1,203</td>
</tr>
<tr>
<td>4</td>
<td>480</td>
<td>1,604</td>
</tr>
<tr>
<td>5</td>
<td>600</td>
<td>2,005</td>
</tr>
<tr>
<td>6</td>
<td>720</td>
<td>2,406</td>
</tr>
<tr>
<td>7</td>
<td>840</td>
<td>3,342</td>
</tr>
<tr>
<td>8</td>
<td>960</td>
<td>3,342</td>
</tr>
</tbody>
</table>

Each credit hour over 15

### GRADUATE DEGREE STUDENTS: with programs in the College of Engineering, and the Graduate School of Public Affairs

<table>
<thead>
<tr>
<th>Credit Hrs.</th>
<th>Resident</th>
<th>Non-resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>$134</td>
<td>$401</td>
</tr>
<tr>
<td>2</td>
<td>268</td>
<td>802</td>
</tr>
<tr>
<td>3</td>
<td>402</td>
<td>1,203</td>
</tr>
<tr>
<td>4</td>
<td>536</td>
<td>1,604</td>
</tr>
<tr>
<td>5</td>
<td>670</td>
<td>2,005</td>
</tr>
<tr>
<td>6</td>
<td>804</td>
<td>2,406</td>
</tr>
<tr>
<td>7</td>
<td>938</td>
<td>3,342</td>
</tr>
<tr>
<td>8</td>
<td>1,072</td>
<td>3,342</td>
</tr>
<tr>
<td>9-15</td>
<td>1,119</td>
<td>3,342</td>
</tr>
</tbody>
</table>

Each credit hour over 15

Graduate degree students who are registered as "candidate for degree" will be assessed the corresponding resident tuition for one credit hour plus the Student Information System Fee.

### THE BOARD OF REGENTS OF THE UNIVERSITY OF COLORADO RESERVES THE RIGHT TO CHANGE TUITION AND FEES AT ANY TIME.

#### Audit

To qualify as an auditor for fall or spring semester, a student must be 21 years of age or older or approved by the Registrar. Auditors may not be registered for any other University of Colorado courses during the time they are auditing and are not eligible to audit courses if they are under suspension from the University or have outstanding financial obligations to the University. The Records Office does not keep any record of courses audited; therefore, credit for these courses cannot be established. Auditors may attend as many courses as they wish (except those courses with laboratories or where special equipment is used), provided they have received permission from each instructor. Auditor's cards are issued after classes begin. This card should be presented to the instructor when requesting permission to attend a class.

There is no auditor status in summer. Auditors, whether resident or nonresident, pay resident tuition for the audited courses during the fall or spring semester for class instruction and library privileges only. Auditors do not receive student parking privileges, and are not eligible for other student services.
Residency Classification for Tuition Purposes

Tuition classification is governed by CRS 23-7-101, et. seq. (1973) as amended. Institutions of higher education are bound to the provisions of this statute and are not free to make exceptions to the rules set forth.

The statute provides that an in-state student is one who has been a legal domiciliary of Colorado for one year or more immediately preceding the beginning of the term for which the in-state classification is being sought. Persons over 22 years of age or who are emancipated establish their own legal domicile. Those who are under 22 years of age and unemancipated assume the domicile of their parent or court appointed legal guardian. An unemancipated minor’s parent must, therefore, have a legal domicile in Colorado for one year or more before the minor may be classified as an in-state student for tuition purposes.

Domicile is established when one has a permanent place of habitation in Colorado and the intention of making Colorado one’s true, fixed, and permanent home and place of habitation. The tuition statute places the burden of establishing a Colorado domicile on the person seeking to establish the domicile. The question of intent is one of documentable fact and needs to be shown by substantial connections with the state sufficient to evidence such intent. Legal domicile in Colorado begins the day after connections with Colorado are made sufficient to evidence one’s intent. The most common ties with the state are (1) change of driver’s license to Colorado; (2) change of automobile registration to Colorado; (3) Colorado voter registration; (4) permanent employment in Colorado; (5) and most important, payment of state income taxes as a resident by one whose income is sufficient to be taxed. Caution: payment or filing of back taxes in no way serves to establish legal domicile retroactive to the time filed.

In order to qualify for in-state tuition for a given term, the 12-month waiting period (which begins when the legal domicile is established) must be over by the first day of classes for the term in question. If one’s 12-month waiting period expires during the semester, in-state tuition cannot be granted until the next semester.

A copy of the Colorado Revised Statutes (1973), as amended, is available in the University of Colorado at Denver Admissions Office.

Once the student’s tuition classification is established, it remains unchanged unless satisfactory information to the contrary is presented. A student who, due to subsequent events, becomes eligible for a change in classification from resident to nonresident or vice versa must inform the Office of Admissions Processing within 15 days after such a change occurs. An adult student or emancipated minor who moves outside of Colorado must send written notification to the Office of Admissions Processing within 15 days of the change.

Once a student is classified as nonresident for tuition purposes, the student must petition the Office of Admissions Processing for a change in classification. Petitions must be submitted NO LATER THAN THE FIRST DAY OF CLASSES of the term for which the student wishes to be classified as a non-resident. It is preferred for petitions to be received 30 days prior to the term. Late petitions will not be considered until the next semester. Specific information may be obtained from the Office of Admissions Processing.

Resident Tuition for Active Duty Military Personnel

The Colorado Legislature approved resident tuition beginning with the Fall 1986 semester for active duty military personnel on permanent duty assignment in Colorado and for their dependents. ELIGIBLE STUDENTS MUST BE CERTIFIED EACH TERM. Students obtain a completed verification form from the base education officer, and submit the form with their military ID to the Records Office after they have registered, before the end of the drop/add period. At that time the student’s bill will be adjusted to reflect the resident tuition rate. Students who have been certified remain classified as non-residents for tuition purposes and must petition to change their status once they establish permanent ties to Colorado.

FINANCIAL AID

Director: Ellie Miller
Office: NC 1030
Telephone: 556-2886

The Office of Financial Aid/Student Employment considers qualified students for financial aid awards. If the student’s application materials are received before the March 30, 1990, priority date, then the student is considered for a package of need-based grant, work-study (part-time employment), and/or long-term loan funds. For the past several years, these packages have consisted of approximately 50% grant funds and 50% of self-help funds (work-study, loan, unmet need).

Graduate students have only been receiving approximately 10% in grant funds. If applications are received after the March 30 priority date, the student is usually considered only for Pell Grant and for outside student loans (Stafford Loan—formerly Guaranteed Student Loan or GSL, Parents Loan for Undergraduate Students, and Supplemental Loan for Students). These funds are not allocated to CU-Denver; they are available throughout the year to students who qualify. There are three separate deadlines for applying for Advantage Scholarship: refer to the separate brochure for further information.

Applicants for Colorado Fellowship, Deans Scholars, and Regents Scholars are subject to different deadlines and are reviewed by other CU-Denver departments (The Graduate School, undergraduate dean’s offices, and the Office of Admissions respectively). All other students are notified of their award status in writing by the Office of Financial Aid/Student Employment.

Eligibility

Each student must qualify for CU-Denver financial aid as follows:
1. Be a U.S. citizen or be admitted to the U.S. by the INS on a permanent basis (except for Colorado Fellowship).
2. Be classified as a degree-seeking student (except for students applying for Advantage Scholarships). Teacher certification students are eligible to apply as undergraduate students for outside student loans (Stafford Loan, Parents Loan for Undergraduate Students, or Supplemental Loan) for
3. Be enrolled for a specified minimum number of credits.
4. Maintain satisfactory academic progress as defined for the financial aid programs.
5. Document financial need by completing the entire need-based application (except for the following programs which are not need-based: Colorado Fellowship, Advantage Scholarship, Colorado Scholars, Deans Scholars, Regents Scholars, Parents Loan for Undergraduate Students, Supplemental Loan for Students, Short Term Loan, and many outside scholarships).
6. Be classified as a resident for tuition purposes (except for the following programs): Pell Grant, Supplemental Educational Opportunity Grant, Advantage Scholarship, Perkins Loan, College Work-Study, Stafford Loan, Parents Loan for Undergraduate Students, and Supplemental Loan for Students.

7. Not be in default on any student loan or owe a refund on any educational grant.

8. Be registered for the draft or enlisted in the armed forces if required by Selective Service.

Application

Each applicant must complete the financial aid application materials for submission to the Office of Financial Aid. Complete information must be available to the financial aid counselors before eligibility can be determined.

Limited Funds. The majority of general financial aid funds are awarded on a first-come, first-served basis to eligible students who document financial need and complete their application process as soon as possible after January 1, 1990. Application completion is defined as having all of the required documents and the results of the need analysis (ACT Family Financial Statement or CSS Financial Aid form) into the Office of Financial Aid/Student Employment. General financial aid is awarded to eligible students until all of the funds are committed for the year. If you complete your file after March 30, 1990, your awards will probably be limited to the Pell Grant (for first undergraduate students only) and/or outside student loans (Stafford Loan, Supplemental Loans for Students, Parents Loan for Undergraduate Students). Please remember to reapply for financial aid each year.

It is the student's responsibility to be sure application materials are complete. Please contact the Office of Financial Aid for application forms and students are referred to the Financial Aid Fact Sheets for complete details regarding financial aid. All financial aid application procedures are subject to change at any time due to revisions in federal and state laws, regulations, and guidelines.

On-Line Application Information

Please try the new on-line Financial Aid Information System. This system will help you complete the ACT Family Financial Statement, provide you with important financial aid information and current news, and produce a printed copy of your institutional financial aid application for you to turn into the Office of Financial Aid. To use the system, go to a CU-Denver computer lab (North Classroom Bldg., Rooms 1206 or 2206), sign on to the CU-Denver vax computer and enter "money" (in small letters) when prompted for a login. The system will take you to a self-explanatory menu. If you have any questions about how to use the system, ask one of the computer advisors.

Qualification

Financial Need. Most financial aid is based on the concept of financial need. Your financial aid counselor calculates financial need as: 1) cost of attendance, minus family contribution which is 2) student/spouse contribution, and 3) parents' contribution (for dependent students only).

The cost of attendance is the cost to attend CU-Denver, including tuition and fees, room and board, books and supplies, transportation, and personal expenses. The Office of Financial Aid/Student Employment determines standard budgets for students based upon average tuition and fees charged and other budget items established by the Colorado Commission on Higher Education.

Independent Student. The federal government has specific guidelines that must be followed to define a self-supporting student (one who reports only his/her own income and assets when applying for aid). For 1990-91, a self-supporting student is one who is 24 years old or older as of December 31, 1991. If you are under 24, you are considered self-supporting if you fall into one of the following categories:

1. Single undergraduate student with no dependents who was not claimed as a dependent on your parents’ 1988 and 1989 federal income tax returns. Also, you must demonstrate that you are self-sufficient by having total income (including financial aid) or at least $4,000 annually for the two calendar years prior to your first receipt of federal financial aid.

2. Graduate or professional student who will not be claimed as a dependent on your parents’ 1990 federal income tax return.

3. Married and will not be claimed as a dependent on your parents’ 1990 federal income tax return.

4. Student with legal dependents other than a spouse.

5. Veteran of the U.S. armed forces.

6. Orphan orward of the court.

7. Appeal to the Financial Aid Committee for an exception to these guidelines and be approved by the Committee because of your unusual circumstances.

If your student/spouse contribution plus your parents’ contribution is equal to or greater than the cost of attendance, you will not qualify for need-based financial aid. For 1989-90, the following budgets were used for room and board, transportation, and personal expenses per month: single students living with parents $315/month; single students not living with parents $700/month. Resident tuition and fees for a full-time student was approximately $725 per semester, and non-resident tuition was approximately $3000. These amounts will probably increase by about 5% for the 1990-91 school year.

The contributions from the student/spouse and from the parents of dependent students are calculated by a standardized formula that is required by federal law. The formula considers income, savings and other assets, family size, number of children in postsecondary school, medical expenses, and other factors. You may appeal for special consideration of your situation and in some cases the standardized contribution may be adjusted by recommendation of the Financial Aid Committee. FINANCIAL AID IS INTENDED TO SUPPLEMENT (NOT REPLACE) FINANCIAL CONTRIBUTIONS FROM YOU AND YOUR PARENTS.

Course Loads. General financial aid (work-study, grants, Perkins Loans) undergraduate recipients usually must carry at least 12 credit hours per semester and graduate students usually must carry at least five graduate credits per semester during the academic year (fall/spring). Higher or lower minimums may be required for individual awards (please check your award letter for the exact number of hours required). Pell grant (available only to first undergraduates) and outside student loan recipients must carry at least six credits per semester for undergraduates and three graduate credits for graduates. Summer Term 1990 minimum course loads are as follows: Full-time: undergraduate — 8 hours, graduate — 3 graduate hours; Half-time: undergraduate — 4 hours, graduate — 2 graduate hours. Higher or lower standards may be required for individual awards. For further information contact the Office of Financial Aid/Student Employment.

Satisfactory Academic Progress. CU-Denver students must make satisfactory academic progress as defined by the Office of Financial Aid/Student Employment in order to be eligible and remain eligible for financial aid. Students are referred to the Satisfactory Academic
Award

Students are notified in writing of their financial aid eligibility approximately 6-12 weeks after all application documents have been received in the Office of Financial Aid. If awarded, an award letter is mailed which includes information such as the type(s) and amount(s) of aid awarded and the minimum number of credit hours that are required for the awards.

Types of Aid

The federal government funds the following programs:
1. Supplemental Education Opportunity Grant (SEOG). A need-based grant program for students who have not yet obtained a bachelor's degree.
2. Perkins Loan (formerly National Direct Student Loan). The interest rate on this long-term loan is 5% and no payments are due until six or nine months (this time differs depending on when you first receive a Perkins Loan) after the student ceases to be enrolled at least half time.
3. College Work-Study. A program that allows students to work on a part-time basis on campus or off campus at nonprofit agencies to help meet their educational costs.

The State of Colorado funds the following programs:
1. Colorado Student Grant. A need-based grant for resident undergraduate students.
2. Colorado Student Incentive Grant. A need-based grant for resident undergraduates who have not yet obtained a bachelor's degree. This grant is funded 50% by the federal government and 50% by the State of Colorado.
3. Colorado Graduate Grant. A need-based grant for resident graduate students.
4. Colorado Work-Study. A program similar to the College Work-Study program, but limited to resident undergraduate students.
5. Pell Grant. Your eligibility for the Pell Grant (federally funded) is determined before any other aid is awarded. Awards are defined by a strict formula provided by the federal government and amounts vary depending on the student's eligibility index, enrollment status, residency classification, and living status. Students are eligible for a Pell Grant if they have not received their first bachelor's degree by June 1, 1990.
6. Outside Student Loans. Your eligibility for all other types of aid should be determined prior to applying for outside student loans. The Stafford Loan (formerly Guaranteed Student Loan) program requires that you show financial need in order to qualify. Most students who are working full time do not document sufficient financial need to qualify for the Stafford Loan. The primary purpose of this program is to make low-interest, long-term loans available to students who do not document sufficient financial need to qualify for the Stafford Loan. Employment opportunities are listed in the Office of Financial Aid/Student Employment, the Auraria Student Assistance Center, and the Center for Internships and Cooperative Education. Full-time undergraduate resident students who apply for College Work-Study and who do not document sufficient financial need may be considered for Colorado No-Need Work-Study. Scholarship information can be found in the Auraria Library Scholarship InfoBank in the reference section of the Library. Handicapped students should inquire about the Ahlin Scholarship in Student Enrollment Services (556-8427). All applicants for need-based financial aid are automatically considered for the Arnold Scholarship. Minority applicants and students whose parents did not graduate with a bachelor's degree are encouraged to apply for the Advantage Scholarship. Students who participate in CMEA, the Pre-Collegiate Development Program, the Minority Scholars Program, or who apply for Advantage Scholarships are automatically considered for Challenge Scholarships. Graduate students should inquire about additional types of aid through The Graduate School and their academic department. Students should be aware that Emergency Student Loans are available as well as Financial Aid Advances. American Indian students should inquire in the office for Bureau of Indian Affairs or tribal scholarships.

REGISTRATION

Selecting a Program and Courses

Students should review the following sections of this catalog that describe the academic programs available at CU-Denver, and that provide information by school or college on the various majors available, course requirements by major, course load policies, and other pertinent information.

Courses available during a particular semester or summer term are listed in the Schedule of Classes, published three months before the beginning of each term. These are available from the Records Office.

Undergraduate students who need assistance in planning a program or in selecting courses should contact the academic unit in which they are enrolled to arrange for an advising appointment prior to registration.

Graduate students should contact their
graduate program for assistance.

Course Scheduling and Abbreviations

For information on scheduling courses, students are encouraged to contact an advisor through their college or school dean's office. In general, the abbreviation preceding the course number identifies the department offering the course. The first digit in the course number indicates the recommended class level of the course:

<table>
<thead>
<tr>
<th>Level of Courses</th>
<th>Student Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>Lower division</td>
</tr>
<tr>
<td>2000</td>
<td>Lower division</td>
</tr>
<tr>
<td>3000</td>
<td>Upper division</td>
</tr>
<tr>
<td>4000</td>
<td>Upper division</td>
</tr>
<tr>
<td>5000</td>
<td>Graduate students or qualified seniors who have instructor's or dean's permission</td>
</tr>
<tr>
<td>6000</td>
<td>Graduate degree students</td>
</tr>
<tr>
<td>7000</td>
<td>Master's and Ph.D. graduate students</td>
</tr>
<tr>
<td>8000</td>
<td>Ph.D. graduate students</td>
</tr>
</tbody>
</table>

The Graduate School policy permits specifically approved courses to be offered concurrently at the 4000 and 5000 levels. It should be expected that work at the graduate (5000) level would involve demonstration of greater maturity and critical skills than at the (4000) undergraduate level.

The digit after the dash in the course number denotes the credit-hour value of the course. The 1-credit lecture/recitation period is 50 minutes long. Hence a student enrolled in a 3-credit hour course will attend class for 150 minutes per week during a 16-week term. A 3-credit hour course will require six to nine hours of work each week outside of class. A laboratory credit includes from two to four hours per week in the laboratory, drafting room, or field. Unless the course descriptions specify laboratory work, it is understood that the classes consist of lectures and discussions.

Abbreviations used in the course descriptions are:

- Coreq. — Corequisite
- Prer. — Prerequisite
- Hrs. — Hours
- Rec. — Recitation
- Lab. — Laboratory
- Sem. — Semester
- Lect. — Lecture
- Wr. — Week

Thus, the description of CHEM. 1020-5 signifies that the course is offered by the chemistry department at the freshman level, and that it carries 5 semester hours of credit which is divided into 3 hours of lecture credit, 1 hour of recitation credit, and 1 hour of laboratory credit. Further, the student must have completed CHEM. 1010 (the prerequisite) before enrolling.

Orientation

An orientation program for all new students is held at the beginning of the fall and spring semesters, prior to the first day of classes. The orientation, conducted by the Records Office and the various schools and colleges, introduces the programs, activities, and services available at CU-Denver. Information on the registration process and degree requirements also is provided. Academic orientation advising sessions are held during the term, before registration for the next term.

Registration

CU-Denver students can register from any telephone. Students will be assigned a time to register and may register at or after their assigned time.

REGISTRATION PRIORITIES

Non-degree students who apply late should be prepared with alternate choices or courses because students in degree programs will register first. All non-degree students should contact the academic advisors of the degree programs in which they are interested in order to ensure that their classes will fulfill the requirements of the program.

Please note: some courses are not open for registration by non-degree students without special permission. Non-degree students should check the restrictions listed for each course in the Schedule of Classes.

Registration is by time assignment only. Continuing students, and new students admitted by the priority deadline will have first priority in the following order: first — graduate students, then — new freshmen, fifth year seniors, seniors, juniors, sophomores, freshmen, with non-degree students registering last. All those admitted after the priority deadline will be assigned to register in the order they are admitted.

POOLED COURSES AT METROPOLITAN STATE COLLEGE

Certain courses in the College of Liberal Arts and Sciences have been pooled with similar courses at Metropolitan State College (MSC). CU-Denver undergraduate students may register for any of the pooled courses listed in the CU-Denver Schedule of Classes.

Restrictions

1. CU-Denver graduate students are not eligible to register for MSC common pool courses.
2. MSC courses will not be included in the University of Colorado grade-point average. MSC courses will appear on the University of Colorado transcript and will count in the hours toward graduation.
3. MSC courses cannot be used to meet specific course requirements toward the major without prior approval of the student's dean. The last 30 semester hours applied toward the baccalaureate degree must be taken in residence at CU-Denver. MSC common pool courses will not satisfy this residence requirement.

INTERINSTITUTIONAL REGISTRATION

CU-Denver degree students may enroll for courses offered by the Community College of Denver, Front Range Community College, and Red Rocks Community College. Students must be enrolled at CU-Denver for at least one course during the semester or summer term to be eligible to register interinstitutionally. Registration is on a space available basis. Interinstitutional courses are evaluated for transfer credit and are not included in a CU-Denver student's grade-point average.

CONCURRENT ENROLLMENT

Degree-seeking students who wish to attend two University of Colorado campuses concurrently must contact their school or college on their home campus. Concurrent registration is available only during fall and spring semesters. A degree student registered on the Denver campus may take up to two courses or 6 semester credit hours (whichever is greater) on another CU campus if:

1. The student obtains a Concurrent Registration form from the office of the academic dean.
2. The course is a required course for the student's degree (not an elective) and not offered at CU-Denver.
3. The student obtains approval from the academic dean.
4. There is space available at the other (host) campus.
5. The student pays tuition at CU-Denver (home) campus at CU-Denver rates.
6. The home campus school or college arranges for space in the host campus classes.
7. The concurrent request is processed
before the end of the drop/add period on both the host and home campuses.

Students may not register for an independent study course through concurrent registration. Students may not take courses pass/fail or for "no-credit" through concurrent registration.

To drop a concurrent course during the host campus drop/add period, arrange the drop at the home campus school or college office. To drop a concurrent course after the end of the host campus drop/add deadline, drop the course at the host campus Records Office.

Study Abroad

The Office of International Education on the Boulder campus offers study abroad programs that are available for all CU students. More than 30 programs are offered around the world. Resident credit at lower division, upper division, or graduate levels can be earned depending on the program selected, and if appropriate, can be applied to the CU-Denver degree. Students also can apply their financial aid to CU-Boulder sponsored study abroad programs. Information is available from the Study Abroad Programs, 492-7741.

Course Loads

Students wishing to take more than 18 semester hours (12 in the summer term) must have the overload approved by the dean of their college or school. Students should petition their academic dean.

Remember that a three-semester-hour course during a fall or spring semester will require six to nine hours of work each week outside of class; a three-semester-hour course during a summer term will require nine to thirteen hours of work each week outside of class.

Suggested maximum course loads for the fall and spring semesters for undergraduate students who are employed:

Employed
40 or more hours per week: 3-6 semester hours
30-39 hours per week: 5-8 semester hours
20-29 hours per week: 7-11 semester hours
10-19 hours per week: 9-15 semester hours

Students must consider their other obligations — academic, professional, and personal — before registering for these courses.

GRADUATE RESTRICTIONS

No more than 15 semester hours taken by a graduate student during a fall or spring semester can be applied toward a graduate degree.

No more than 10 semester hours taken by a graduate student during a given summer term can be applied to a graduate degree.

DEFINITION OF FULL- AND HALF-TIME STATUS FOR FINANCIAL AID AND LOAN DEFERMENT: FALL AND SPRING

Individual students receiving financial aid may be required to complete hours in addition to those listed below. The exact requirements for financial aid will be listed in the student's financial aid award letter.

Fall and Spring: effective Fall 1987

Undergraduates and non-degree students:

Fall
Full-time . . . 12 or more semester hours
Half-time . . . 6 or more semester hours

Spring
Full-time . . . 12 or more semester hours
Half-time . . . 6 or more semester hours

Graduate degree students:

Fall
Full-time:
3 or more hours of graduate level classes (course number — 5000+)
1 or more hours of thesis (master's report)

Half-time:
3 or more hours of graduate level classes (course number — 5000+)
1 or more hours of thesis (not master's report)

Spring
Full-time:
3 or more hours of graduate level classes (course number — 5000+)
1 or more hours of thesis (master's report)

Half-time:
3 or more hours of graduate level classes (course number — 5000+)
1 or more hours of thesis (not master's report)

Summer (10 week term)

Undergraduates and non-degree students:

Full-time: 8 or more semester hours
Half-time: 4 or more semester hours

Credit awarded for the summer term will apply toward graduation and other requirements for which it is appropriate. There are three types of exams as described below.

Advanced Standing and Advanced Placement Credit

Undergraduate students may obtain credit for lower-division courses in which they demonstrate proficiency by examination. By passing an examination, the student will be given credit for the course to satisfy lower division requirements and may be eligible to enroll in higher level courses than indicated by the student's formal academic experience. Credit granted for courses by examination is treated as transfer credit without a grade but does count toward graduation.

Advanced Placement Program

The Advanced Placement Program of the College Entrance Examination Board (CEEB) allows students to take advanced work while in high school and then be examined for credit at the college level. Students who take advanced placement courses and subsequently receive scores of 2 or 5 on the CEEB Advanced Placement Examination are generally given
college credit for lower-level courses in which they have demonstrated proficiency and are granted advanced standing in those areas. Students with scores below 4 may be considered for advanced placement by the discipline concerned. All credit must be validated by subsequent academic performance. For more information contact your high school counselor or the Director of Outreach and Recruitment at CU-Denver.

Credit By Examination

Degree students may take examinations for credit. To qualify for an examination, the student must be formally working toward a degree at CU-Denver, have a grade-point average of at least 2.0, and be currently registered. Examinations are arranged through the Records Office, and a nonrefundable fee is charged.

Students should contact the office of the dean of the academic unit in which they are enrolled.

College-level Examination Program

Incoming CU-Denver students may earn University credit by examination in subject areas in which they have excelled at college-level proficiency. Interested students are encouraged to take appropriate subject examinations provided in the College-Level Examinations Program (CLEP) of the College Entrance Examination Board testing service. For more information call the CU-Denver Testing Center at 556-2861.

Students who are interested in credit for CLEP examinations must contact the office of their school or college.

Credit for Military Service and Schooling and ROTC

MILITARY SERVICE AND SCHOOLING

To have credit for educational experiences evaluated, applicants with military experience should submit the following with their application: (1) a copy of DD Form 214 and (2) DD Form 295, Application for the Evaluation of Education Experience During Military Service. USAF personnel may present an official transcript from the Community College of the Air Force in lieu of DD Form 295.

Credit will be awarded as recommended by the Commission on the Accreditation of Service Experiences of the American Council on Education to the extent that the credit is applicable to the degree the student is seeking at CU-Denver.

Credit for courses completed through the U.S. Armed Forces Institute will be evaluated on the same basis as transfer credit from collegiate institutions.

RESERVE OFFICERS' TRAINING CORPS (ROTC)

Students enrolled in Army or Air Force ROTC programs should consult with their college or school regarding the application of ROTC course credit toward graduation requirements. The College of Liberal Arts and Sciences allows a maximum of 6 semester hours of ROTC credit to be applied toward baccalaureate degree requirements. The College of Business and Administration stipulates that ROTC courses may be used for credit only for nonbusiness elective requirements and that no credit may be given for freshman and sophomore ROTC courses. Furthermore, a maximum of 12 semester hours may be applied toward baccalaureate degree requirements in business and then only if the ROTC program is completed.

Grading System and Policies

The following grading system and policies for pass/fail registration, dropping and adding courses, and withdrawal from the University have been standardized for all academic units of the University.

GRADE SYMBOLS

The instructor is responsible for whatever grade symbol (A, B, C, D, F, IF, IW, or IP) is to be assigned. Special symbols (NC, W, and Y) are indications of registration or grade status and are not assigned by the instructor. Pass/fail designations are not assigned by the instructor but are automatically converted by the grade application system, explained under Pass/Fail Procedure.

A—superior/excellent—4 credit points per credit hour.
B—good/better than average—3 points per credit hour.
C—competent/average—2 credit points per hour.
D—minimum passing—1 credit point per credit hour.
F—failing—no credit points per credit hour.

Beginning with the Spring 1984 Semester, the University approved use of a PLUS/ MINUS grading system, where a B+ corresponds to 3.3 credit points per credit hour, and a B- corresponds to 2.7 credit points per credit hour. Instructors in those schools and colleges may, at their discretion, use the PLUS/MINUS system, but are not required to do so.

IF—incomplete—regarded as F if not completed within one year.
IW—incomplete—regarded as W if not completed within one year.
P/F—pass/fail—P grade is not included in the grade-point average; the F grade is included; up to 16 hours of pass/fail course work may be credited toward a bachelor's degree.
P/H/P—honors/pass/fail—intended for honors courses; credit hours count toward the degree but are not included in the grade-point average.

Special Symbols

NC—indicates registration on a no-credit basis.
W—indicates withdrawal without credit.
Y—indicates the final grade roster was not received by the time grades were processed. Graduate students enrolled at the 5000 level of a class course (4000/5000) will be expected to complete additional work and be evaluated commensurate with graduate standards as specified by the course instructor. An incomplete grade is only awarded when special circumstances prevent a student's completing a course during the term. Students have one year to complete an INCOMPLETE. After one year, an IW is regarded as a DROP-PASSING; an IF as a DROP-FAILING. Students should not re-register for courses for which they have received INCOMPLETES.

Most schools and colleges require a contract between the instructor and student outlining the work necessary to "complete" the incomplete.

MID-TERM GRADES

Beginning with the Spring 1990 Semester, instructors will be asked to assign mid-term grades for a small population of students. Students who may be in some academic difficulty may be contacted and counseled about support services available to them. Please note: academic support services are available to all students through the Office of Student Retention Services, NC 2012, 556-2324.

PASS/FAIL PROCEDURE

1. Students who wish to register for a course on a pass/fail basis must do so during the regular registration. Changes to or from a pass/fail basis may be made
only during the regular drop/add period.

2. Up to 16 semester hours of regular course work may be taken on a pass/fail basis and credited toward the bachelor's degree. Only 6 hours of course work may be taken pass/fail in any given semester.

3. Academic deans and faculty will not be informed of pass/fail registration. All students who register on a pass/fail appear on the regular class roster, and a normal letter grade is assigned by the professor. When grades are received in the Records Office, those registrations with a pass/fail designation are automatically converted by the grade application system. Grades of D and above convert to grades of P. Courses taken pass/fail will be included in hours toward graduation. Pass grades are not included in a student's grade-point average. An F grade in a course taken pass/fail will be included in the grade-point average.

4. The record of pass/fail registration is maintained by the Records Office.

5. Exceptions to the pass/fail regulations are permitted for specified courses offered by the School of Education, the Division of Extended Studies, and Study Abroad Programs.

6. Graduate degree students can exercise the P/F option for undergraduate courses only. A grade of P will not be acceptable for graduate credit to satisfy any Graduate School requirement.

7. Students who register for a course on a pass/fail basis, may not later decide to receive a letter grade. Each school or college limits the hours and courses for which students may register on a pass/fail basis.

*Please note:* many other institutions will not accept a "P" grade for transfer credit.

---

### PASS/FAIL OPTION RESTRICTIONS

<table>
<thead>
<tr>
<th>College</th>
<th>General</th>
<th>16 Hours Maximum</th>
<th>Transfer Students</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business and Administration</strong></td>
<td>Only non-business electives may be taken pass/fail</td>
<td>Only 6 semester hours may be taken pass/fail</td>
<td>Only 6 semester hours may be taken pass/fail</td>
</tr>
<tr>
<td><strong>Engineering and Applied Science</strong></td>
<td>Required courses may not be taken pass/fail. Upper division humanities and social sciences electives are acceptable, otherwise major department approval is required; students without a major are not eligible to take courses pass/fail. Recommended maximum one course/semester.</td>
<td>Includes courses taken in the honors program</td>
<td>Maximum of 1 semester hour of pass/fail may be applied toward graduation for every 9 semester hours taken in the college</td>
</tr>
<tr>
<td><strong>Liberal Arts and Sciences</strong></td>
<td>May be restricted in certain majors; not included in 30 hours of C or better work required for major. No more than 6 hours P/F any semester.</td>
<td>Does not include courses taken in honors, physical education, cooperative education and certain teacher certification courses; also does not include ENGL 1002 Proficiency Test or MATH 1002 Test</td>
<td>May not be used by students graduating with only 30 semester hours taken at the University</td>
</tr>
<tr>
<td><strong>Music</strong></td>
<td>Only non-music electives may be taken pass/fail. No more than 6 hours P/F any semester.</td>
<td>Includes courses taken in the honors program.</td>
<td></td>
</tr>
</tbody>
</table>
NO CREDIT

Students may register for a course on a no-credit basis with the consent of their instructor and the dean of their school or college. File the no credit form in the Records Office before the end of the drop/add period. Students who register for a course on a no credit basis may not later decide that they want a letter grade. Students may not register again for a course which has already been taken on a no credit basis.

AUDIT

People who are not registered for classes on any University of Colorado campus may pay the resident tuition for a class to audit a class, with the instructor's permission. Audited courses do not appear on a transcript. No credit is given.

SENIOR CITIZENS

Senior citizens (aged 60 and over) may audit classes for no charge. Contact the Division of Enrollment and Student Services at 556-8427, NC 2204.

GRADE-POINT AVERAGE

The grade-point average is computed by multiplying the credit points per hour (for example, B = 3) by the number of hours for each course, totaling the hours and the credit points, and dividing the total points by the total hours.

Grades of P, NC, Y, W, IP, IW, and IF are not included in the grade-point average. If an IP grade has not been completed within one year, the course is regarded as failed and a grade of F is automatically calculated in the grade-point average at the end of the one-year grace period.

If an IW grade has not been completed within one year, the course is regarded as dropped. If a course is repeated, all grades earned are used in determining the grade-point average. The University of Colorado grade-point average does not include courses taken at other institutions.

The grade-point average of graduate students includes only courses, credit hours, and credit points accumulated while enrolled in The Graduate School.

The grade-point average does not appear on official transcripts issued from the Records Office but does appear on the Grade Report issued each semester.

Students should consult with the dean of their college or school for an explanation of any exceptions made to the University uniform grade-point average.

Undergraduates and non-degree students must maintain a 2.0 grade-point average to remain in good standing. Graduate students must maintain a 3.0 GPA to remain in good standing. Students whose GPA falls below the 2.0/3.0 level are subject to probation or suspension. Such students will be notified by their school or college.

GRADE REPORTS

Grade reports are mailed to CU-Denver students approximately two weeks after the end of the term. To obtain replacement reports, students must present picture identification at the Records Office.

Student Classification

Students are classified according to the number of semester hours passed:

<table>
<thead>
<tr>
<th>Classification</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>0-29</td>
</tr>
<tr>
<td>Sophomore</td>
<td>30-59</td>
</tr>
<tr>
<td>Junior</td>
<td>60-89</td>
</tr>
<tr>
<td>Senior</td>
<td>90+</td>
</tr>
</tbody>
</table>

All transfer students will be classified on the same basis according to their hours of credit accepted by the University of Colorado.

Graduation

Undergraduates. Students who have completed 80 or more semester hours should make an appointment with the advising office of their school or college to determine what requirements remain for graduation. Students intending to graduate must file a Diploma Card with their school or college during the first week of their graduation term. Students will not be finally certified to graduate until final grades have been evaluated. After students have been certified to graduate they must reapply to return to CU-Denver.

Graduates. Students must file an Application for Candidacy and a Diploma Card with The Graduate School on the Denver campus during the first week of their graduation term. Check with The Graduate School for more complete information. Students will not be finally certified to graduate until final grades have been evaluated. After students have been certified to graduate, they must reapply to return to CU-Denver.

Commencement. Letters will be mailed in early April to students eligible to participate in the spring commencement. Information will be provided about ordering special display diplomas, being fitted for caps and gowns, and obtaining diplomas and transcripts with the degree recorded. Students graduating at the end of the summer term or the end of the fall semester may participate in the following spring commencement.

Transcripts

Transcripts of academic record at the University of Colorado (all campuses) may be ordered in person or by mail from the University of Colorado at Denver, Transcript Office, 1200 Larimer St., Campus Box 167, Denver, CO 80204. Official transcripts will not be available until approximately four weeks after final examinations. A transcript on which a degree is to be recorded will not be available until approximately eight weeks after final examinations. Requests should include the following:

1. Student's full name (include given or other name if applicable).
2. Student number.
4. The last term and campus the student attended.
5. Whether the current semester grades are to be included when a transcript is ordered near the end of a term. Whether the request should be held until a degree is recorded.
6. Agency, college, or individuals to whom transcripts are to be sent. Complete mailing addresses should be included.

Transcripts sent to students are labeled "issued to student."

7. Student's signature. (This is the student's authorization to release the records to the designee.)

There is no charge for individual official transcripts. Transcripts are prepared only at the student's request. A student with financial obligations to the University that are due and unpaid will not be granted a transcript. Official transcripts require five to seven working days to be generated. Unofficial copies of transcripts sent to CU-Denver from other institutions can be requested at the Records Office. Official transcripts should be requested directly from the issuing institution. Unofficial CU-Denver transcripts are available to students in the CU-Denver Records Office. Students must present picture ID.
Adding and Dropping Courses

**ADDING COURSES**

Students may add courses to their original registration during the first 12 (8 in the summer) days of full-term classes, provided there is space available. Instructor approval may be required after the first week of classes.

**DROPPING COURSES**

1. Students may drop courses without approval during the first 12 days of the fall or spring semester (8th day of the summer term). Tuition will not be charged for the courses which are dropped as long as the student is not withdrawing. No record of the dropped course will appear on the student's permanent record.

2. After the 12th day of a fall or spring semester (8th day of the summer term), the instructor's signature is required and the instructor must indicate whether the student is passing or failing. If the student is passing, the course will appear on the student's permanent record with the grade of W if the student is failing, the course will appear on the perfor example, B = 3) by the number of hours for each course, totaling the hours and the credit points, and dividing the total points by the total hours.

   Grades of F, NC, Y, W, IP, IW, and IF are not included in the grade-point average.

   If an IF grade has not been completed within one year, the course is regarded as failed and a grade of F is automatically calculated in the grade-point average at the end of the one-year grace period.

   If an IW grade has not been completed even though the drop is allowed.

4. Dropping all courses requires an official University withdrawal form.

   Deadlines for module courses and intensive courses are published in the Schedule of Classes each term.

**Withdrawal from the University**

To withdraw from the University, students must obtain approval from their academic dean's office, the Bursar's Office, and the Records Office. The withdrawal date is recorded on the student's permanent record page. If the withdrawal date is prior to the 13th day of the semester (9th day of the summer term), the courses will not appear on the student's permanent record. If the withdrawal date is after the 12th day, the courses will appear with W grades.

Students may not withdraw after the 10th week of the semester (7th week of the summer term) except under documented circumstances clearly beyond their control.

Students who are receiving veteran's benefits or financial aid also must obtain the required signature of those respective offices. International students must obtain clearance from the Office of International Students.

A student who stops attending classes without officially withdrawing from the University will receive grades of F for all course work enrolled for during that term.

To withdraw from the University, a graduate student must apply to the dean of The Graduate School for permission to withdraw in good standing. Students who withdraw without communicating with the dean and without filing the appropriate Withdrawal Form will be marked as having failed their courses for the term.

Deadlines for module courses and intensive courses, as well as specific requirements and tuition adjustment, appear in the Schedule of Classes published prior to the beginning of each term.

**Originality of Work**

In all academic areas it is imperative that either work be original or explicit acknowledgment be given for the use of other persons' ideas or language. Students should consult with instructors to learn specific procedures appropriate for documenting the work of others in each given field. Breaches of academic honesty can result in disciplinary measures ranging from lowering of a grade to permanent compulsory withdrawal from the University.

**Family Educational Rights and Privacy Act**

Periodically, but not less than annually, the University of Colorado informs students of the Family Educational Rights and Privacy Act, with which the institution intends to comply fully. The Act was designed to protect the privacy of educational records, to establish the right of students to inspect and review their educational records, and to provide guidelines for the correction of inaccurate or misleading data through informal and formal hearings. Students also have the right to file complaints with the Family Educational Rights and Privacy Act Office (FERPA) concerning alleged failures by the institution to comply with the Act.

Local policy explains in detail the procedures to be used by the institution for compliance with the provisions of the Act. Copies of the policy can be found in the library on each of the several campuses of the University of Colorado.

The following items of student information have been designated by the University of Colorado as public or directory information: student name, address, telephone number, dates of attendance, registration status, class, major field of study, awards, honors, degree(s) conferred, past and present participation in officially recognized sports and activities, physical factors (height, weight) of athletes, date and place of birth. This information may be disclosed by the University for any purpose at its discretion.

Currently enrolled students may withhold disclosure of any category of information under the Family Educational Rights and Privacy Act. To withhold disclosure, written notification must be received in the Records Office on the appropriate campus prior to the end of the drop/add period in the term. Forms requesting the withholding of directory information are available in the Records Office.

The request to withhold disclosure will remain in effect until the student provides written notification to the Records Office. The University of Colorado assumes that when a student fails to request to have directory information withheld, the student is indicating approval for disclosure of information for that term and following terms until otherwise requested.

Questions concerning the Family Educational Rights and Privacy Act may be referred to the Records Office. 556-2389.

**University of Colorado at Denver Confidentiality of Academic Records**

**STUDENTS:**

DO have the right to view and inspect their educational records (excluding any financial records of their parents).

DO have the right to have Directory Information withheld from all persons or organizations outside the University.
Directory Information includes:

name, address, telephone number
date and place of birth
dates of attendance, registration status,
class, major field of study
awards, honors, degree(s) conferred
past and present participation in
officially recognized sports and activities
physical characteristics (height, weight) of athletes

DO NOT have the right to obtain their grades, or other information not considered Directory Information, by telephone.

PARENTS:
DO have the right to obtain the educational records of their child only if they provide a signed statement that their son or daughter is a dependent as defined by the U.S. Internal Revenue Service. The Records Office, in NC 1003, 556-2389, has forms available to parents for such requests. Parents are, however, encouraged to obtain final grades with a written approval from the student.

UNIVERSITY OF COLORADO PERSONNEL:
DO have the right to use educational records of students in the normal exercise of their duties.

DO NOT have the right to use educational records of students for employment purposes, for social organizations, for personal reasons, or for other non-educational interests, without written consent of the student.

PERSONS OR ORGANIZATIONS OUTSIDE THE UNIVERSITY OF COLORADO:
DO have the right to obtain the Directory Information listed above, unless the student has made a request for non-disclosure. When the term microfiche, or the computer terminal on-line file of the Student Information System indicates PRIVATE, inquirers will be told that no information can be released without the student’s written consent.

PERSONS OR ORGANIZATIONS PROVIDING FINANCIAL AID TO STUDENTS:
DO have the right to educational records of students only as necessary in determining and enforcing terms of financial aid.

PERSONS IN AN EMERGENCY:
DO have the right to obtain confidential academic records necessary to protect the health or safety of students and others, but such information will only be released by the Office of the Associate Vice Chancellor for Enrollment and Student Services, 556-8427.

These regulations are required by the Family Educational Rights and Privacy Act of 1974 (the Buckley Amendment). For further information, please call the Records Office at (303) 556-2389.

Student records will be released only to the student with current, appropriate identification or upon written authorization of the student whose records are being requested.

SPECIAL PROGRAMS AND FACILITIES

Alumni Association

The CU-Denver Alumni Association supports the development and awareness of the University through a variety of networks and activities. Founded in 1976, students automatically become members upon graduation. Friends and non-degree former students are also welcome to participate.

Horizons, a newspaper published quarterly, is mailed to members of the Association. Alumni are invited to attend periodic reunions and/or activities which might interest them. The Mack Easton Award for Distinguished Service, The Outstanding Alumnus Award, and the Legislative Recognition Award are bestowed each year at commencement and are sponsored by the Association. A program of alumni use of the campus recreation center, library, and parking lots is also available through the Association.

The governing board is comprised of alumni representing all schools and colleges on campus. This group plans events, implements programs, and raises funds with the goal of advancing and increasing the visibility of the University.

Auraria Book Center

Student Union: ground level, 556-3230

Hours: M-Th 8-6, F 8-5, Sat. 10-3 except vacation and interim periods.

The Auraria Book Center carries academic, technical, reference, and exam preparation books in support of your higher education. Best sellers, new releases, and gift book selections change frequently and are often accompanied by displays of special value books in many subjects. For additional savings on general reading books, join the Auraria Book Club at the Book Information desk. Special orders and out of print searches are available at no charge.

Bring your course printouts to locate textbooks! Subject areas are marked on each set of shelves; departmental abbreviations, course, and section numbers are printed on a shelf tag below each required or optional textbook.

A full refund is given for new and used books accompanied by your receipt and returned within the first three weeks of class for regular semesters and during the first week of class for short terms. Please read the refund policy attached to your receipt.

The Convenience Store is located near the main store in the Student Union lower mall and has extended hours for those wishing to buy snacks, magazines, sundries, and school supplies. Used texts are bought back from students throughout the year, and merchandise refunds and exchanges also are performed here.

Auraria Reprographics offers full-service copying in the Convenience Store, M-Th 7:30-4, F 7:30-5. Special papers, transparencies, reductions and enlargements, and other options may be specified for jobs of all sizes. A self-serv copier is available for small orders.

Two IDs are required for purchases paid for by check. The Book Center also accepts MasterCard and VISA charges.

Personal computer systems and a variety of software are offered to Auraria campus students at educational discount prices. A current, validated Auraria ID must be presented at the time of purchase.

Computing Services

Computing Services supports computer use by both the academic and administrative communities at CU-Denver. Most administrative processing is done in University Management Systems in Boulder with data entry, output processing, and user support provided by Computing Services in Denver. Most academic processing is either done on campus or through one of several networks available through Computing Services.

The Denver campus maintains a PRIME 9950 under PRIMOS, a VAX 8700 under VMS, and a series of computers (Pyramid 90X, 8-processor Sequent B21000, Intel 16-processor Hypercube) under the UNIX operating system. Access to all machines is through a communications network that allows connection to the campus libraries’ on-line card-catalog (CARL-PAC) as well as to any of the other CU campuses. The VMS and UNIX machines are all connected over the ethernet which also is a node on the growing Colorado
SuperNet network. This net provides access to many academic computing networks (ARPANET, NSFNET, JVNNet, CSNET, etc.) as well as high-speed connections to the Colorado School of Mines, University of Denver, Colorado Springs and Boulder CU campuses, and Colorado State University. CU-Denver also is a BITNET site. A significant amount of computing also is accomplished on the campus' 900 personal computers both in laboratories (10 teaching labs and 3 public labs are available) and in offices.

Computing Services staff provides assistance to academic and administrative users on all computing systems available on every phase of their use. Advisors and a full-time academic user services staff assist faculty as well as students enrolled in courses using computing with questions regarding programming and the use of computer systems and software available. Administrative users are assisted by a data processing staff as well as user services personnel. Computing systems on the campus are maintained by an operations staff who also assist faculty and staff with hardware planning, acquisitions, questions, and problems.

The goal of Computing Services is to assist all members of the CU-Denver community in using computing as an effective tool in their work. For further information and an informative booklet about computing at CU-Denver, please call 556-2583.

Division of Extended Studies

The University of Colorado at Denver has served the life-long learner and non-traditional students as possible. Extended Studies uses the city for its classrooms, as well as the Auraria Campus.

Consistent with the University's high standards, Extended Studies credit courses supplement the University's general course offerings and include weekend and evening options. Noncredit courses explore a wide array of topics: test preparation, foreign languages, computers, fine arts, writing and literature, personal and professional development, and recreation. Certificate programs include management and secretarial skills, the humanities, and paralegal and legal studies. Through its Corporate Programs, CU-Denver tailors its educational resources to private businesses and industry, bringing the University directly to different organizations and community settings. On and off-campus, CU-Denver's Centers and Institutes engage in research and provide training and technical assistance to the public.

To meet a growing need for adult education that is personalized, economical, locally applicable, and professionally beneficial, the University of Colorado's resources are accessible through Extended Studies. Individuals, groups, and organizations are invited to call Extended Studies at 556-2735.

University of Colorado Foundation, Inc.

In 1981-82, the University of Colorado Foundation established a Denver office. The CU Foundation was established in 1967 at the direction of the Board of Regents of the University as a privately governed, non-profit corporation, chartered under the laws of the State of Colorado. It is operated exclusively for charitable, scientific, or educational purposes designed to promote the welfare of CU. The CU Foundation is the approved agency to solicit, receive, and administer gifts from private sources.

International Education/Study Abroad

The Office of International Education on the Boulder campus expedites the exchange of students and faculty, hosts foreign visitors, promotes special relationships with foreign universities, and advises foreign students and scholars for Fulbright and other scholarships at CU-Boulder. The office also arranges study abroad programs and offers over 30 different programs around the globe. Students on any CU campus can participate in most of these programs.

Some of the study abroad programs are of the traditional junior year abroad variety, in which students are placed directly in foreign universities for an academic year. Such programs are available at the University of Lancaster, England; the University of Bordeaux, France; the University of Costa Rica in San Jose; the American University in Cairo, Egypt; the University of Regensburg, West Germany; the Hebrew University of Jerusalem, Israel; the Institute of Higher Education and Technology in Monterrey, Mexico; the University of Seville, Spain; and Tunghai University in Taiwan.

For students unable to spend an academic year abroad, programs for a single semester or summer are available with various emphases, including intensive language learning. Single semester programs are offered in Chambery and Rennes, France; Guadalajara and Monterrey, Mexico; London, England; San Jose, Costa Rica; Seville and Alicante, Spain; and Taipei and Taichung, Taiwan. Summer programs are located in Kassel, West Germany; Perugia, Italy; and London, England. Special summer programs, e.g., art history in Italy, are organized with specific departments upon request.

Students are enrolled at the University of Colorado while participating in these study abroad programs. The applicability of credit in particular departments and colleges of CU-Denver is up to the departments and colleges. A B average with the equivalent of two years of college level work in the appropriate language is required for most of the academic year programs. Financial aid from CU-Denver can be applied to program costs in most cases.

More information about study abroad programs is available in the Office of International Education, Boulder campus, 492-7741.

Auraria Student Assistance Center Division

The Auraria Student Assistance Center Division (ASACD) is composed of nine offices offering specialized assistance to staff, faculty, and all present and prospective students on the Auraria Higher Education Center campus.

1. Office of the Dean. The office is responsible for the overall administrative functioning of the Division in priority
services to students, faculty, and other members of the campus community.

2. Office of Information and Referral Services. This is a central information source that provides objective assistance to prospective students desiring to enroll at CU-Denver or one of the other academic institutions on the Auraria campus. Campus tours are available on a prearranged basis.

3. Office of Career Services. Three major areas of service are provided by this office: career planning, student employment, and career employment assistance. Individual career counseling, testing, workshops, and resources are available to students and alumni in planning their careers. In the Campus Career Library, the Discover, a computerized career guidance system, is available for exploring career options. Listings of part-time and temporary jobs are available for currently enrolled students. Individual career employment counseling, on-campus interviews with employers, vacancy listings, and employer information are available services to graduating students and alumni.

4. Office of Disabled Student Services. The office provides academic support services to ensure access for students with disabilities at CU-Denver and MSC. Services include notetaking, interpreting, counseling related to disabilities, parking permits, scribe service, test assistance, etc.

5. Colorado Rehabilitation Services. Campus office of the state of Colorado Department of Social Services. This office assists disabled students to become suitably employed and self-supporting. The office works cooperatively with the Office of Disabled Student Services to provide services to students. Services may include job seeking skills, skill training, vocational testing and evaluation, vocational counseling, provision of occupational tools and materials, and referral to additional sources of financial assistance.

6. Office of International Programs. The office assists international students on campus from 80 countries by providing support services and aiding in bridging the cultural gaps which many of them experience when entering the community to attend college.

7. Office of Off-Campus Housing Services. The Office of Off-Campus Housing Services is the campus clearinghouse for information on housing. Counseling and housing information distribution are provided to help students make informed decisions about housing.

8. Auraria Child Care Centers. The child care programs are offered at two sites: the Auraria campus Child Care Center and the Auraria Child Care Center at Osage Initiatives. Both centers serve the needs of students, staff, and faculty of the Auraria campus. The goal of the program is to foster the development of competence in intellectual and social skills in a safe, nurturing environment. All supervising and assisting teachers are degreed and meet the certification guidelines of the National Academy of Early Childhood programs. Children aged 18 months to 6 years are served at the Auraria campus Child Care Center with a fully accredited kindergarten program. Children aged 6 weeks to 5 years are served at the Auraria Child Care Center at Osage Initiatives.

9. Spring International Language Center. The office provides English language training to non-immigrant students who have not been accepted at one of the three institutions on campus. The focus is on all language skills: grammar, reading, writing, and listening/speaking. In addition, students can choose from several special electives such as TOEFL preparation, vocabulary building, business concepts, Idiomatic English, etc. There are 5 nine-week terms and 5 levels of English are offered.

Auraria Student Union

The Auraria Student Union, located at 9th and Lawrence, houses a cafeteria, the campus Book Center, a study lounge, game room, offices for student government and organizations, a copy center, exhibit space, locker rentals, meeting and conference facilities, and a tavern.

UNIVERSITY POLICIES

Affirmative Action/Equal Opportunity Title IX

CU-Denver follows a policy of equal opportunity in education and in employment. In pursuance of this policy, no Denver campus department, unit, discipline, or employee shall discriminate against an individual or group on the basis of race, sex, creed, color, age, national origin, veteran status, or individual handicap. This policy applies to all areas of the University affecting present and prospective students or employees.

The institution's educational programs, activities, and services offered to students and/or employees are administered on a nondiscriminatory basis subject to the provisions of the Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, 504 of the Rehabilitation Act of 1973, Vietnam-Era Veterans Readjustment Act of 1974, and Age Discrimination in Employment Act of 1967.

A CU-Denver Affirmative Action/Equal Opportunity program has been established to implement this policy. For information about these provisions on equity, discrimination, or fairness contact Affirmative Action, 556-2509.

Ombuds Office

In any system as large and complex as CU-Denver, misunderstandings and disagreements may occur. The Ombuds Office helps to enhance the clarity and dissemination of information, to simplify decision making and communication, to assist with the process of change and with adjustment to change, and to improve understanding among the constituents (staff, students, faculty, administrators) of the University.

The Ombuds Office provides information about programs, policies, services, and procedures affecting members of the University community; makes referrals to appropriate state, CU system, and CU-Denver resources; serves as consultant in the preparation for and review of policies and procedures; and assists in the solution of problems and the resolution of disputes.

Ombuds Office services are informal, impartial, confidential, and independent of administrative authorities. These services do not replace or circumvent existing channels, but help them work more effectively. For further information or assistance, contact the Ombuds Officer, DR 850, 556-4493.

University Policy Regarding A Drug-Free Workplace

The University of Colorado at Denver is committed to providing a drug-free workplace and environment. The University prohibits the unlawful manufacture, distribution, dispensation, possession, or use of any controlled substance in the workplace. Those individuals who are found to be in violation are engaged in serious misconduct and subject to disciplinary action consistent with the Faculty Handbook (1988), the applicable rules of the State Personnel System, the University's Unclassified Staff Handbook, and the Student's Discipline and Review Procedures.
Academic Honor Code and Discipline Policies

Members of the University of Colorado at Denver feel it is an historically established rule of education that instructors have the authority to conduct classes, make assignments, require examinations or other exercises, and make judgments about the academic performance of students.

Maintaining the quality and high performance of students makes it imperative that the academic work completed at the University be original and completed honestly. It is the concern of every student and faculty member that such standards be maintained. A university's reputation depends on the highest standards of intellectual honesty and ethical conduct.

Academic disciplinary matters are concerns to be addressed by schools or colleges, allowing each school/college to determine the severity and consequences of each infraction. Under the Laws of the Regents, Article IX 2.8 and Article VI.C, all matters of educational policy affecting the school or college including academic requirements for admission, for continuance and for graduation shall be under the jurisdiction of each school or college. In addition, the college or school shall have jurisdiction over matters of academic ethics/academic dishonesty.

Each college and school is required to maintain a standing committee to decide cases of academic dishonesty as defined in this document. Students and faculty are urged to understand what constitutes academic dishonesty in order to better support and maintain high standards of academic scholarship and conduct.

FORMS OF ACADEMIC DISHONESTY

As members of the academic community, students and faculty accept the responsibility to conduct themselves with integrity in a manner compatible with the University's function as an educational institution. Furthermore, all members of the academic community have a special responsibility to ensure that the University's ethical standards are maintained. One of these standards is academic honesty. Many students underestimate how strongly most faculty and peers feel about academic honesty. Academic dishonesty is defined as a student's using unauthorized assistance with intent to deceive an instructor or such other person who may be assigned to evaluate the student's work, in meeting course and degree requirements. Examples of academic dishonesty include, but are not limited to the following:

A. Plagiarism

Plagiarism is the use of distinctive ideas or words belonging to another person without providing adequate acknowledgement of that person's contribution. Regardless of the means of appropriation, incorporating another's work into one's own requires adequate identification and acknowledgement. Plagiarism is doubly unethical because it deprives the true author of the rightful credit and gives that credit to someone who has not earned it. It is the theft of intellectual property. However, acknowledgement is not necessary when the material used is common knowledge. When the source is not noted, the following would constitute plagiarism:

1. Word-for-word copying.
2. The mosaic (to intersperse a few words of one's own here and there with, in essence, copying another's work).
3. The paraphrase (the rewriting of others' work, yet still using their fundamental idea or theory).
4. Fabrication (inventing or counterfeiting sources).
5. Ghost-written material (submitting another's effort as one's own).

It is also plagiarism to neglect quotation marks on material that is otherwise acknowledged.

B. Cheating

Cheating involves intentionally possessing, communicating, using (or attempting to use) materials, information, notes, study aids, "cheat sheets," or other devices not authorized by the instructor in any academic exercise, or the communication with any other person during such an exercise.

Examples:
1. Copying from another's paper or receiving unauthorized assistance from another during an academic exercise or in the submission of academic material.
2. Using a calculator when the use has been specifically disallowed.
3. Collaborating with another student or students during an academic exercise without the consent of the instructor.

C. Fabrication and Falsification

This is the intentional and unauthorized alteration or invention of any information or citation in an academic exercise.

Examples:
1. Fabrication involves inventing or counterfeiting information; i.e., creating results not obtained, as in a laboratory experiment.
2. Falsification involves altering results, deliberately changing information to suit one's needs.

D. Multiple Submission

This is the submission of substantial portions of either written or oral academic work which has previously earned credit when such submission is made without instructor authorization.

E. Misuse of Academic Materials

This is intentionally or knowingly destroying, stealing, or making inaccessible, library or other academic resource material.

Examples:
1. Stealing or destroying library or reference materials or computer programs or files.
2. Stealing or destroying another student's notes or materials, or having in possession such materials without the owner's permission.
3. Receiving assistance in locating or using sources of information in an assignment where such assistance has been forbidden by the instructor.
4. Illegitimate possession and disposition of examinations or answer keys to tests and examinations.
5. Unauthorized alteration, forgery, or falsification of official academic records.
6. Unauthorized selling or purchasing of examinations, papers, or assignments.

F. Complicity in Academic Dishonesty

This is intentionally or knowingly contributing to the academic dishonesty of another.

These examples of academic dishonesty shall not be construed to be comprehensive and infractions will be dealt with on an individual basis. It is the obligation of each student to assist in the enforcement of academic standards; infractions — whether by students or faculty — should be first brought to the attention of the instructor.

PROCEDURES IN CASES OF SUSPECTED ACADEMIC DISHONESTY

Students concerned about academic dishonesty should contact their school or college for more specific information.
Faculty and staff members or students may submit charges of academic dishonesty against students. A student who has evidence that another student is guilty of academic dishonesty should inform the instructor or the dean of the appropriate college in writing of the charge. A faculty member who has evidence that a student is guilty of academic dishonesty should confront the student with the evidence. In cases of academic dishonesty, the faculty member has the authority to reprimand the student appropriately, which could include the issuance of a failing grade (F). In such case of issuance of failing grade for academic dishonesty, the faculty member shall submit a written report to the dean of the appropriate college within five working days. The report shall include, but is not limited to, the time, place, nature of offense(s), the name(s) of the accused, the accuser, witnesses (if any). If the faculty member feels that his or her reprimand or action is an insufficient sanction for a particular case of academic dishonesty, the faculty member may recommend to the dean of the appropriate college the further action be taken.

If this signed report recommends further action, the dean or a committee designated shall schedule a disciplinary hearing as soon as possible. The student has the right to be represented by legal counsel and to be present during the committee’s proceedings. Student(s) must notify the dean of the appropriate college five working days in advance of the hearing that he/she intends to have legal counsel present. The dean or the committee designated may take any of the following actions:

1. Take no further action against the accused student(s).
2. Place student(s) on disciplinary probation for a specified period of time. The record of this would be kept in the committee’s confidential files and the student’s academic file.
3. Suspension of registration for a specified period of time. A record of this shall be kept in the committee’s confidential file and a copy sent to the Registrar.
4. Expulsion: no opportunity to return to the college in which the infraction occurred. A record of this shall be kept permanently in the committee’s confidential file and a copy sent to the Registrar.

Notification to Student(s)

In all cases, the student(s) should be notified of the hearing after seven working days, in writing, of the dean’s or the designated committee’s decision.

Interinstitution Appeal Procedures

Students who are taking courses at CU-Denver, but are enrolled at other educational institutions on the Auraria campus and are charged with dishonesty, are subject to the same procedures outlined above.

Code of Student Conduct (Student Rights and Responsibilities and Procedures for Disciplinary Review and Action)

STANDARDS OF CONDUCT FOR WHICH ACTION MAY BE TAKEN IF A VIOLATION OCCURS

All persons on University property are required for reasonable cause to identify themselves when requested by University or Auraria Public Safety officials acting in the performance of their duties. Acting through its administrative officers, the University reserves the right to exclude those posing a danger to University personnel or property and those who interfere with its function as an educational institution.

All persons on CU-Denver/Auraria property who are not students or employees of the University are required to adhere to the Code of Conduct applicable to University students and to abide by University policies and campus regulations.

The behaviors outlined below will not be tolerated because they threaten the safety of individuals and violate the basic purpose of the University and the personal rights and freedoms of its members:

1. Intentional obstruction, disruption, or interference with teaching, research, disciplinary proceedings, or other University activities, including its public service and administrative functions or authorized activities on the CU-Denver/Auraria premises.
2. Willful obstruction or interference with the freedom of movement of students, school officials, employees, and invited guests to all facilities of the CU-Denver/Auraria campus.
3. Physical abuse of any person on property owned or controlled by the CU-Denver/Auraria Higher Education Center or at functions sponsored or supervised by the University, or conduct that threatens or endangers the health or safety of any such person.
4. Verbal or physical harassment and/or hazing in all forms, which includes, but is not limited to, striking, laying hands upon, treating with violence, or offering to do bodily harm to another person with intent to punish or injure; or other treatment of a tyrannical, abusive, shameful, insulting, or humiliating nature. (This includes, but is not limited to, demeaning behavior of an ethnic, sexist, or racist nature, unwanted sexual advances or intimidations.)
5. Prohibited entry to or use of CU-Denver/Auraria facilities, defined as unauthorized entry or use of CU-Denver/Auraria property or facilities for illegal purposes or purposes detrimental to the University.
6. Forgery, fraud (to include computer fraud), falsification, alteration, or use of University documents, records, or instruments of identification with intent to gain any unentitled advantage.
7. Theft or damage to CU-Denver/Auraria property and the private property of students, University officials, employees, and invited guests when such property is located upon or within CU-Denver/Auraria buildings or facilities. This includes the possession of known stolen property.
8. Possession of firearms, explosives, or other dangerous weapons or materials within or upon the grounds, buildings, or any other facilities of the CU-Denver/Auraria campus. This policy shall not apply to any police officer or other peace officer while on duty authorized by the University, or others authorized in writing by the Chief of the Auraria Public Safety or designee. (A dangerous weapon is an instrument that is designed to or likely to produce bodily harm. Weapons may include, but are not limited to, firearms, explosives, BB guns, slingshots, martial arts devices, brass knuckles, bowie knives, daggers or similar knives, or switchblades. A harmless instrument designed to look like a firearm, explosive, or dangerous weapon which is used by a person to cause fear in or assault on another person is expressly included within the meaning of the terms firearms, explosive, or dangerous weapon.)
9. Sale, distribution, use, possession, or manufacture of illegal drugs within or on the grounds, buildings, or any other facilities of the CU-Denver/Auraria campus.
10. Physical restriction, coercion, or harassment of any person; significant theft; sale/ manufacture of illegal drugs (includes possession of a sufficient quantity with intent to sell); damage, theft, or unauthorized possession of University property; or forgery, falsification, alteration, or use of University documents, records or instruments of identification to gain any unentitled advantage.
UNIVERSITY STANDARDS AND CRIMINAL VIOLATIONS

As a member of the University community, you are held accountable not only for upholding civil and criminal laws, but University Standards as well. Enrollment does not confer either immunity or special consideration with reference to civil and criminal laws. Disciplinary action by the University will not be subject to challenge or postponement on the grounds that criminal charges involving the same incident have been dismissed, reduced, or are pending in civil or criminal court. In addition the University reserves the right to pursue disciplinary action if a student violates a standard and withdraws from the University before administrative action is final.

USE OF UNIVERSITY/AURARIA PROPERTY OR FACILITIES

Nothing in this Code of Conduct shall be construed to prevent peaceful and orderly assembly for the voicing of concerns or grievances. The University is dedicated to the pursuit of knowledge through a free exchange of ideas, and this shall be a cardinal principle in the determination of whether or not a proposed use of University facilities is appropriate.

The Auraria Higher Education Center has established campus regulations and procedures governing the use of CU-Denver/Auraria grounds, buildings, and other facilities. Such regulations are designed to prevent interference with University functions and activities. Except where otherwise specifically authorized, or when members of the public are invited, the use of CU-Denver/Auraria facilities shall be limited to faculty, staff, and students of the CU-Denver/Auraria campus, and to organizations having chapters, local groups, or other recognized University connected representation among faculty, staff, or students of the three academic institutions on the Auraria campus.

CLASSROOM CONDUCT

You are expected to conduct yourself appropriately in classroom situations. If disruptive behavior occurs in a classroom, an instructor has the authority to ask you to leave the classroom. Should such disorderly or disruptive conduct persist, the instructor should report the matter to Auraria Public Safety and/or the appropriate Dean's office. The appropriate Dean or his/her representative may withdraw a student from a particular class for disruptive behavior, while the Student Discipline Committee may recommend to the Associate Vice Chancellor for Enrollment and Student Services to suspend, permanently expel, and/or permanently exclude the student from the campus. Appeal questions concerning disruptive behavior should be directed to the Academic Dean's office when withdrawal from a class is involved, and to the Director of Student Life when suspension or expulsion from the University is involved.

NONACADEMIC DISCIPLINE POLICIES

Violations of Standards of Conduct should be reported to the Director of Student Life during working hours. Auraria Public Safety should be contacted during non-duty hours.

If a violation occurs on campus and it is not in a specific building, Auraria Public Safety and/or the Director of Student Life should be contacted.

If emergency help is needed when on campus, contact Auraria Public Safety and when off campus contact the Denver Police.

Actions available to campus officials include, but are not limited to: asking those involved in inappropriate behavior to cease and desist; requesting offender(s) to leave the Auraria campus; denying or restricting use of facilities or services; calling Auraria Public Safety for assistance; billing offender(s) for any physical damages; pressing civil charges; and referring student(s) to the Director of Student Life. The chart that follows illustrates the overall structure involved.

DISCIPLINE STRUCTURE AT THE UNIVERSITY OF COLORADO AT DENVER

1. Violations observed may be resolved by any of the following:
   a. University Departments such as:
      - Admissions/Records
      - Student Union
      - Auraria Public Safety
      - Financial Aid
      - Veterans Affairs
      - Faculty/Staff
      - Students
      - Non-University Members

2. If violation warrants further attention contact:
   a. Director of Student Life
      i. if student(s) desires a review by the Director of Student Life

3. Academic dishonesty discipline falls under the jurisdiction of the individual colleges and schools.

4. If violation warrants possible suspension or expulsion
   a. Student Discipline Committee
   b. Student Discipline Committee
   c. Associate Vice Chancellor for Enrollment and Student Services

POLICIES AND PROCEDURES

When one of the 10 Standards of Conduct listed in this code is violated, the student may be referred to the Director of Student Life. Any person may refer a student or student group suspected of violating this code to the Director of Student Life. Persons making such referrals will be asked to provide information pertinent to the case. The Director of Student Life will make a determination as to the seriousness of the case. This will be done in most situations by asking the student(s) involved in the case to come in for an administrative interview to determine what actions, if any, will be taken by the University. Students will be notified in writing of the results of such administrative reviews.

The Director of Student Life has the authority to:

1. Dismiss the case.
2. Take no further action other than talking with the accused student(s).
3. Issue a University warning (a statement that a student's behavior has been inappropriate and any further violation of University rules will result in stronger disciplinary action).
4. Place the student on disciplinary probation, a violation of the terms of which could result in suspension or expulsion from the University.
5. Refer cases to the Student Discipline Committee where the above sanctions are determined to be inadequate or the student(s) desires an appeal.
6. Take other actions including but not limited to counseling, insuring the violator(s) provides compensation for theft or damage, and/or placing stops on registration.

STUDENT DISCIPLINE COMMITTEE POLICIES AND PROCEDURES

Disciplinary proceedings shall be conducted as administrative proceedings and not as judicial proceedings. The University is not a part of the judicial branch of state government. The University has authority to promulgate and enforce internal rules of behavior that shall be administered in a fair and impartial manner in harmony with its educational objectives and
administrative nature. As part of the administrative nature of the committee's proceedings, fundamental rules of fairness will be followed. Copies of these procedures are available in the Office of the Associate Vice Chancellor for Enrollment and Student Services.

This committee, composed of three students and two faculty members, makes the decision whether students charged with violations of the student conduct code may continue to attend the University of Colorado at Denver.

The Student Discipline Committee has the authority to:
1. Dismiss the case.
2. Take no action other than talking with the accused student.
3. Issue a University warning (a statement that a student's behavior has been inappropriate and further violation of University rules will result in stronger disciplinary action).
4. Place the student on disciplinary probation, a violation of the terms of which could result in suspension or expulsion from the University.
5. Recommend suspension of a student from the University for disciplinary reasons. This suspension may be for various lengths of time ranging from one semester to an indefinite period of time; after the period of disciplinary suspension has expired a student may apply in writing to have the notation on the student's record removed.
6. Recommend expulsion of a student from the University; notation on the student's record will be kept permanently. When a student is suspended or expelled for disciplinary reasons an additional sanction may include being excluded from the Auraria campus.
7. Other sanctions including but not limited to counseling, insuring the violator(s) provides compensation for theft or damage, and/or placing stops on registration.

Students must be notified in writing of the disciplinary action taken within five (5) days.

REVIEW PROCEDURES

A student may request a review of the recommendation of suspension or expulsion by the Student Discipline Committee within seven (7) working days to the Associate Vice Chancellor for Enrollment and Student Services. Except in cases involving the exercise of the power of summary suspension (see below), the sanctions of suspension or expulsion for disciplinary reasons shall be effective only after the administrative review by the

Associate Vice Chancellor for Enrollment and Student Services, has been exhausted or waived. The Associate Vice Chancellor for Enrollment and Student Services decision shall be in writing to the student(s) with a copy to the Student Discipline Committee. Copies of review procedures may be obtained from the Office of the Associate Vice Chancellor for Enrollment and Student Services.

SUMMARY SUSPENSION

Summary suspension is a suspension from the University which begins immediately upon notice from the appropriate University official without a formal hearing by the Student Discipline Committee. A hearing before the Student Discipline Committee is then scheduled as soon as possible (usually within seven calendar days) to determine the disposition of the case. Summary suspension may also include a physical exclusion from the campus if deemed necessary.

The Chancellor and/or a Vice Chancellor have the authority to suspend summarily any student when in their opinions such suspension is necessary to:
1. Maintain order on the campus.
2. Preserve the orderly functioning of the University.
3. Stop interference in any manner with the public or private rights of citizens on CU-Denver/Auraria owned or controlled property.
4. Stop actions that are threatening to the health or safety of any person.
5. Stop actions that are destroying or damaging property of the CU-Denver/Auraria campus, its students, faculty, staff, or guests.

PERMANENT RECORD NOTATIONS

While disciplinary proceedings are pending or contemplated, a temporary hold will be placed on the student's academic record. It will not be released until all actions and appeal procedures have been completed or finalized by the University. Only in those cases where suspension, deferred suspension, or permanent expulsion results from disciplinary action will notations be placed on the academic record.

RELEASE OF DISCIPLINARY INFORMATION

Access to any student's academic transcript or disciplinary file shall be governed by provisions of the Family Educational Rights and Privacy Act of 1974. Only the student charged or those University officials who have a legitimate educational interest in disciplinary information may have access to the files. All other inquiries including but not limited to employers, governmental agencies, news media, friends, or Denver Police must have a written release from the student to gain access to University disciplinary files.

Every effort will be made by the University to respect the privacy of the student. However, where the identity of the student has been publicly disclosed in the news media, the University reserves the right to respond as it deems appropriate to describe fairly and accurately the disposition of disciplinary matters.

REFUND POLICY AFTER DISCIPLINARY ACTION

Submission of registration materials obligates the student to pay the assessed tuition and fees for that term. If a student is suspended or expelled from the University, the amount of tuition/fees which would be refunded would be the same as when a student voluntarily withdraws from a term. See the General Information section of this catalog or the Schedule of Classes for more information.

The official withdrawal date applicable for tuition/fee refund purposes will be the date of the Student Discipline Committee's decision. In the event that circumstances are such that the accused student has registered for a subsequent term before the final decision is made, that student does so at his/her own risk and may be liable for payment of tuition and fees for both terms. The Committee will make the decision as to when official suspension or expulsion begins. Failure to make the required payment will result in the following action: students will become ineligible for all University services; no grades will be issued for courses in progress; no transcripts, diplomas, certification, or registration materials will be issued for the student until the bill is paid in full; a late payment charge in addition to the interest on the unpaid balance will be assessed.

TRI-INSTITUTIONAL VIOLATIONS

Procedures in deciding violations of the Code of Student Conduct, involving students from other academic institutions on the Auraria campus, have been developed by CU-Denver and the institution(s) involved. In such cases, the Director of Student Life should be contacted.
Responsibilities of Computing Services Users

Access to CU-Denver computing systems, and use of CU-Denver computing resources, is a privilege granted to members of the CU-Denver community for scholarly, research, and administrative purposes. Those who use computing services on the CU-Denver campus are expected to do so in an effective, efficient, ethical, and legal manner.

As a condition of using computer resources on the CU-Denver campus, users are expected to respect the privacy of other users, to respect the integrity of the computer systems and other users' data, and to use computer resources in an efficient and productive manner.

Members of the academic community are expected to respect the intellectual effort and creativity of others. Therefore, it is the responsibility of all users to respect copyright protection of licensed computer software. Users do not have the right to copy licensed software programs or documentation without the specific permission of the copyright holder, or to use unauthorized copies of licensed software. Unauthorized use, duplication, or distribution of computer software is a violation of University policy and Federal law.

(This statement is adapted from material in the CU-Denver Computing Service News, the University of Colorado Administrative Policy Statement on “Copying Computer Software”, and the CU-Boulder Academic Computing Services Statement of “Responsibilities of Users”)

Sexual Harassment

It shall be a violation of University policy for anyone who is authorized to recommend or take action affecting faculty, staff or students: 1) to make sexual advances or request sexual favors when submission to or rejection of such conduct is the basis for either implicitly or explicitly imposing or granting terms and conditions of employment that either favorably or adversely affect the faculty, staff, or student’s welfare; 2) to grant, recommend, or refuse to take action because of sexual favors, or as a reprisal against the person who has rejected or reported sexual advances; 3) to act on the basis of sex with the purpose or effect of unreasonably interfering with an individual’s work performance or of creating an intimidating, hostile, or offensive working environment; 4) to disregard and to fail to investigate allegations of sexual harassment whether reported by the person who is the subject of the alleged harassment, or a witness, and to fail to take timely corrective action in the event misconduct has occurred. Whenever there is an abuse of authority or neglect of responsibility involving sexual harassment, the supervisor is required to take prompt and corrective action consistent with discipline provisions of the appropriate policy manual. A faculty, staff, or student member of the University community may file a written complaint with the Office of Affirmative Action, 556-2509, or Mary Lou Fenili, Sexual Harassment Officer, DR 850, 556-1493.

STUDENT SERVICES

Associate Vice Chancellor for Enrollment and Student Services: Sheila Hood

Student Life

Students at CU-Denver reflect the diversity of its environment: many are older than those considered to be traditional college students; have employment and family responsibilities in addition to their academic programs; include substantial numbers of minorities, women, and single parents; and are most often enrolled part time.

To meet the needs of this diverse student population, CU-Denver provides student life programs and activities designed to complement students' academic programs and to enhance their total educational experience. Students are provided opportunities to develop, experience, and participate in student government, social, cultural, intellectual, and recreational programs. Student life programs create an environment in which students are:

• Assisted in developing leadership through opportunities to practice decision making, management and marketing, interpersonal and group communication, and relationship skills.
• Encouraged and aided in developing social, cultural, intellectual, recreation and governance programs that expand involvement with the campus community and society and lead to mature appreciation of these pursuits.
• Encouraged to explore self-directed activities that provide opportunities for personal growth in individual and group settings.
• Exposed to various cultures and experiences, ideas and issues, art and musical forms, and styles of life.
• Informed about institutional policies and procedures and how these are related to their lives and activities.

• Aided in the awareness and utilization of campus facilities and other resources.
• Assisted in developing community spirit through creative interaction among staff, faculty, students, and members of the local community. Students are encouraged to involve their families in campus events and activities.

Programs and services provided by the Associated Students of CU-Denver, the Division of Enrollment and Student Services of CU-Denver, and the Auraria Student Assistance Center Division contribute to the fulfillment of this philosophy.

Clubs and Organizations

ACM Computing Club
American Institute of Architecture
American Planning Association
American Society of Landscape Architects
Amnesty International
Art Club
Anthropology Club
Associated Black Students
Associated Engineering Students
Beta Lambda
Beta Alpha Omega
Beta Gamma Sigma
Biology Club
CASA
Chinese Culture Club
Denver Society of Black Engineers and Scientists
Doctoral Students Association
Economics Club
Equipoardants Pre-Law Club
Eta Kappa Nu
Finance Club
Forensics Team
Geology Club
Golden Key Honor Society
Health Careers Club
Hispanic Student Association
Indigenous Peoples Club
Institute of Electronic and Electrical Engineers
International Law Society
Iranian Cultural Club
Korean Christian Fellowship
Korean Student Association
Master's of Social Sciences Club
MBA Association
Mechanical Engineers
Musicians Association
Native American Student Association
Official Literary Society
Phi Alpha Thetac
Phi Chi Theta
Philosophy Club
Photo Club
Pi Sigma Alpha
Pocket Billiards Club
Psi Chi
Rainshadow Delegation
SARA
Second Stage Theatre Club
Society of Hispanic Engineers and Scientists
Sociology Club
South American Student Association
Tau Beta Phi
Vietnamese Student Association

Associated Students of the University of Colorado at Denver (ASCUD)

The Associated Students of the University of Colorado at Denver (ASCUD) serves as a voice for students and provides activities and services not normally offered to students under the formal University structure. ASCUD-Denver assists students with information concerning student clubs and organizations, issues concerning student status and other information of interest to students in general. ASCU-Denver also provides students with assistance with grievances and with the opportunity to become more intimately involved with the University community through active participation in student government itself or through service on University, tri-institutional, and AHEC committees. More information concerning services and activities can be obtained in the Student Government Offices, Student Union, Room 340, 556-2510.

Student Legal Services

Student legal services are available to assist students with off-campus legal problems through the provision of legal advice, litigation preparation, document interpretation, assistance in negotiation. The service will not represent students in court. This student fee funded program is provided free of charge to CU-Denver students; however, a charge may be assessed for actual costs incurred such as copying, typing, etc. Contact the office for further details at 556-3333, Student Union, Room 255A.

The Advocate

The purpose of the student newspaper is to advocate and provide a marketplace of ideas from which students may make an impartial judgment of their own. The newspaper strives to include a combination of good investigative reporting, feature articles, and items of general interest to its campus readership. In addition, the newspaper is a tool to encourage and develop writers, journalists, artists, and other student members of its general management and production staff. The office is in the Student Union, Room 151, 556-8321.

Office of Student Life

The Office of Student Life is the coordinating, resource, and general information center for student clubs and organizations, student government (ASCUD), student programs, and the academic honor societies. The office is responsible for the administration of the student fee budget and monitors all student fee expenditures to assure compliance with CU-Denver and the state of Colorado regulations and procedures. The Director of Student Life represents the Associate Vice Chancellor for Enrollment and Student Services on selected CU-Denver, tri-institutional, and AHEC committees and maintains effective lines of communication with MSC, CCD, and AHEC. The director administers the student conduct and discipline procedure as described in the Code of Student Conduct. The Office of Student Life is located in the Student Union, Room 153, 556-3399.

Office of Veterans Affairs

The Office of Veterans Affairs (OVA) is an initial contact point for eligible veteran and dependent students attending CU-Denver utilizing Veterans Administration educational benefits. This office assists students with filling out VA paperwork and in solving problems associated with the receipt of VA-related benefits.

The OVA maintains proper certification for each eligible student to ensure that each student meets Veterans Administration requirements of attendance, course load and content, and other regulations critical to the receipt of educational benefits payments.

In addition, the OVA provides VA Vocational Rehabilitation referrals, VA tutorial assistance, the Colorado Tuition Assistance Program, and VA work/study positions for qualified veterans. For further information contact the Office of Veterans Affairs at 556-2630, NC 4015.

Office of Student Development Services

Phone: 556-2815
Office: NC 2013

The Office of Student Development Services provides a variety of support programs and services to CU-Denver students. Our mission is to help students grow in self understanding, to help make their college years a satisfying and productive experience, and to facilitate meaningful preparation for future goals. Our offerings include the following:

Counseling Services. Students may obtain FREE short term personal counseling provided by professional staff. We also will assist students and others in locating appropriate counseling/mental health services in the community. The office also sponsors professionally-facilitated support groups.

Programs and Workshops. The office sponsors a variety of FREE or low-cost programs and workshops on a variety of topics such as assertiveness training, stress management, college survival skills, drug and alcohol awareness, etc. These programs are open to the entire CU-Denver community.

Career Development Services. The office provides career development workshops and programs, career interest testing, and individual career counseling to CU-Denver students. Career tests offered include Strong Campbell Interest and Career Orientation Placement and Evaluation Survey.

Women's Programs and Services. Offerings in this area include: a "Reentry Program for Women" each semester which assists reentry women as they make the transition to college life; advocacy programs such as Self Defense for Women, and Dealing with Sexual Harassment; scholarship offerings; and referral/ resource information.

Testing Services. The office of Student Development Services also houses a full-service Testing Center which provides testing for all levels of postsecondary education, and professional certification. Tests offered include:

ACT American College Test
CAT California Achievement Test
GRE Graduate Record Examination
GMAT Graduate Management Admissions Test
GSLIT Graduate School Foreign Language Test
Office of Student Retention Services

The Office of Student Retention Services offers an array of services and programs designed to foster cultural diversity within the CU-Denver student body, help students adjust to the social and intellectual environment of the campus, and provide the academic support students need to succeed in their studies and derive maximum benefit from their college experience. Outreach and retention services are provided by professional staff in four centers. These include the Center for First-Year Students, Center for Learning Assistance, Center for Educational Opportunity and Cultural Diversity, and the Center for Pre-Collegiate Development. The Office of Student Retention Services is located in NC 2012, 556-2324.

CENTER FOR FIRST-YEAR STUDENTS

The Center for First-Year Students offers individualized support services to help freshman students adjust to college life and succeed in their college studies. Personal advisors in the Center provide orientation to the campus and its programs, assist students in interpreting academic policies and requirements, assist in the selection of classes and academic programs commensurate with students' educational and career interests, refer students to other campus resources, and provide advocacy, if necessary. The Center is located in NC 2012, 556-2546.

CENTER FOR EDUCATIONAL OPPORTUNITY AND CULTURAL DIVERSITY

The Center for Educational Opportunity and Cultural Diversity provides access and educational opportunities to ethnic minority students through services conducive to the student's retention and graduation. The Center houses four distinct programs, each of which provides academic advising, scholarship information, cultural programs, advocacy, and other support services tailored to the specific needs of their students. The Center is located in NC 2012, 556-2324.

American Indian Student Services Program
Asian American Student Services Program
Black Student Services Program
Hispanic Student Services Program

CENTER FOR PRE-COLLEGIATE DEVELOPMENT

Programs offered by the Center serve to motivate minority high school students to pursue post-secondary education and equip them with the academic skills needed to be successful in their college endeavors. The Center is located in NC 2014, 556-2322.

Pre-Collegiate Development Program. This program enables students in grades 9 through 12 to engage in a wide range of university activities throughout the academic year and during a full-time, five-week summer program. The academic year component offers monthly study skills and career orientation workshops, advising, tutoring, and a variety of cultural enrichment experiences. The five-week summer program for students in the 10th and 11th grades consists of accelerated classes for which students receive elective high school credit, career orientation, and engage in cultural activities.

Minority Scholars Program. The MSP is an early college enrollment program for college bound, high achieving minority students who are completing their final year of high school. The program enables students to begin their college studies by taking one course at CU-Denver during the spring semester of their senior year. The credit earned in the course can be applied toward a bachelor's degree. While enrolled in the program, students participate in workshops designed to acclimate them to the University and prepare them for college study.

CENTER FOR LEARNING ASSISTANCE

The Center for Learning Assistance is designed to promote student success in the academic setting. Services are available to all CU-Denver students. The Center's services include tutoring, workshops, academic institutional credit courses, consulting, and a minority resource library. First-generation college students may be eligible for more intensive services through the Student Support Services component of the Center. The Center is located in NC 2004, 556-2802.

Tutoring. Free tutoring is available in many subject areas (some limitations apply). Individual or group sessions are held on weekdays/evenings. Both scheduled and open, "drop-in" style tutoring are available at established times throughout each term.

Workshops. Study skills and computer workshops are provided on such topics as test-taking, memory and study techniques, note-taking, introduction to the personal computer, and word processing.

Consulting. Academic, financial aid, and personal consulting are available. Peer advocacy is available to students eligible for the Student Support Services Program.

Library. The Center maintains a small periodical and a book collection authored by, and/or about, minorities; these resources are available for student research and leisure.

Courses. Courses are offered in a small group format in the areas of college survival skills (study skills and computer word processing), English as a second language, and problem solving.

CMMU. 1400-3. Reading for Speakers of Other Languages. This course is designed for ESL students who need to improve their reading and vocabulary skills. Students will increase their reading ability through vocabulary building, work attack strategies, and reading analysis.

CMMU. 1410-3. Composition for Speakers of Other Languages I. This is the first course in the ESL composition sequence. Writing begins with sentence-level development and continues with the development of paragraphs based on Western rhetorical patterns. Grammar appropriate to students' needs will be incorporated into the class.

CMMU. 1420-3. Composition for Speakers of Other Languages II. Continued work on grammar, syntax, and the mechanics of writing. Writing begins with paragraphs and moves into essay writing. Prer. CMMU. 1410 or ESL coordinator's approval.

CMMU. 1430-3. Advanced ESL Writing Skills. This is the third course in the ESL composition sequence. Emphasis is placed on more complex grammatical problems and on the development of longer compositions. Prer. CMMU. 1420 or ESL coordinator's approval.

STSK. 0705-1. Problem Solving. This course is designed to improve investigative and problem solving skills. Scientific theory, empirical methodology, and research methods will be utilized. Individual topics of investigation will be assigned.

STSK. 0707-1. College Survival Skills. This course is designed to promote success in the academic setting. Topics covered will include university resources, conquering the
Students.

STSK. 0807-1. Introduction to Word Processing. This course will thoroughly familiarize the student with an easy-to-use word processing program that will assist in the process of writing text revision and rearrangement, and the production of "letter-perfect" documents. (The word processing program used will be one that is available in the open, student-use computer lab areas.)

STSK. 0800-1. Advanced ESL Grammar/Composition. This class meets for two hours a week. It is designed for students who do not feel competent with their English composition skills. This class is highly individualized in order to focus on those grammar and writing structures that pose particular problems for ESL students.

STSK. 0801-1. Communications Skills for ESL Students. This course meets twice a week to improve the oral communication skills of students whose first language is not English. Skills include use of idiomatic English, cross-cultural awareness, cross-cultural problems in communications, and pronunciation.

STSK. 0802-1. Improving Academic Reading Skills for ESL Students. This class meets twice a week. The aim of the class is to improve the student's ability to read academic texts. Skills practiced include skimming/scanning, reading for the main idea, and critical reading.

STSK. 0806-1. Study Skills for ESL Students. This class is designed for ESL students to improve the skills needed for effective participation in the college classroom. It will meet two times a week and will be taken in conjunction with a social science introductory level class. Coreqs., Econ., or PSc., or Soc. to be determined.

STSK. 0807-1. College Survival Skills for ESL Students. This two-hour a week course covers topics such as college resources, time management, textbook reading, test anxiety, and test-taking. The goal of this course is to help students acquire the skills needed to succeed in an academic setting.

CENTER FOR INTERNSHIPS AND COOPERATIVE EDUCATION

Director: Janet Michalski
Assistant Director and Coordinator, Engineering: Diane Berkley
Coordinator, Liberal Arts and Sciences: Cherrie Grove
Coordinator, Business and Administration: Wayne Sundell
Coordinator, Liberal Arts and Sciences: Anthony Trelikes
Administrative Assistant: Becky Carter
IBM Faculty on Loan: James T. Hrbek
Office: 1047 Ninth Street Historic Park
Telephone: 556-2892

The Center for Internships and Cooperative Education, established at CU-Denver in 1973, provides students with an opportunity to supplement their academic classroom learning with on-the-job work experiences or internships related to their academic studies. Students are placed either as paid co-op trainees or as interns for academic credit with corporations, businesses, or government agencies in the Denver metropolitan area as well as out of state.

Faculty coordinators from each of the University's colleges and schools act as liaisons between the Center and the academic departments. The Center currently places over 400 students each year with some 250 participating employers. Over 30 percent of all co-op students are graduate students.

Cooperative Education

Cooperative education is an educational method which combines classroom study with paid, career related, off-campus work. The purpose is to give students the opportunity to apply what they have learned in the classroom to real world situations, and to bring that experience back to the classroom as a learning tool.

Cooperative education offers students paid long-term positions (two or more semesters) during which students alternate semesters of full-time work with semesters of full-time school, or work part time year round. Co-op experiences may be eligible for academic credit, and many jobs lead to permanent career positions upon graduation.

Internships

Internships offer students short-term positions (one semester) and they may or may not be paid. Internships are usually done for academic credit and are popular with students who like to explore a variety of careers. Many students complete two, three, or even four internships before graduation. Internships, like co-op jobs, are related to the student's academic studies and/or career goals.

Eligibility for Placement

The Center is open to all students enrolled at least half time in any CU-Denver college or school who have completed their freshman year, have maintained a grade-point average of 2.5, and have completed at least 12 hours in residence (6 hours for graduate students). Some employers have additional requirements, i.e., U.S. citizenship, willingness to travel, and specific course work.

Academic Credit for Work Experience

Undergraduate students placed by the Center in paid or non-paid positions, as well as students who have obtained their own jobs, can apply to earn academic credit through courses in the College of Liberal Arts and Sciences, and the College of Engineering and Applied Science. Graduate students in the College of Liberal Arts and Sciences, School of Education, Graduate School of Public Affairs, and School of Architecture and Planning can earn internship, experiential learning, field study, or practicum credit through courses established for this purpose.

Why Students Participate in Cooperative Education

- Students recognize the value of combining theory with practice and find greater relevance in their studies.
- Co-op education allows students to test classroom teaching in the laboratory of the real world.
• The program teaches students valuable job-search skills such as resume writing and interviewing techniques.
• Co-op provides a means of financial assistance that is available to all students, regardless of family income levels or other financial aid arrangements, and does not leave students burdened with educational debts.
• The inclusion of a work component and the contribution from co-op earnings are major factors in encouraging first-generation college students to pursue a college degree.
• Because work experiences involve students with co-workers who come from a variety of backgrounds, students develop a deeper understanding of other people and greater skills in human relations.

Why Employers Participate in Co-op Programs

• Co-op students are an excellent source of temporary manpower for special projects and peak loads or busy seasons.
• Co-op allows the employer to assess an individual's potential for employment after graduation, thus saving entry-level recruiting costs.
• Co-op students can increase productivity of full-time professional staff.
• Co-op students are highly motivated, productive, and dependable.
• CU-Denver students bring knowledge about the latest academic research to their employers.
• As verified by many studies, co-op students subsequently become full-time employees with far lower turnover rates and better promotion potential than the average entry level professional.

Facts About Cooperative Education

• Cooperative education programs have been established in over 80 percent of the Fortune 500 corporations. All of the top 10 Fortune 500 companies are involved in cooperative education.
• The last three presidents of General Motors at one time were cooperative education students.
• Cooperative education has been conducted successfully in the U.S. since 1906.
• Over 1,000 colleges and universities currently have cooperative education programs.

• An estimated 200,000 college students are enrolled in cooperative education and gross annual earnings are calculated to be in excess of $200,000,000.

Co-op Employers

Employers who recruit CU-Denver students for cooperative education positions include:

- Martin Marietta
- IBM Corporation
- Hughes Aircraft Company
- MacNeil/Lehrer Newshour
- National Park Service
- Rockwell International
- U.S. Bureau of Reclamation
- U. S. WEST Communications
- Walt Disney World, Inc.
- Office of the Governor, State of Colorado
- Peat Marwick Main & Co.
- Kyle Belda Gallery
- National Bureau of Standards
- KCNC-TV
- Los Angeles Times
- U.S. General Accounting Office
- Denver General Hospital
- Environmental Protection Agency
- Denver Center for the Performing Arts
- Walters & Their Law Firm
- Bloomsbury Review
- Colorado Housing & Finance Authority
- Hospice of Metro Denver
- U.S. Bureau of Land Management
- Denver Public Defender's Office
- Colorado Association of Commerce and Industry
- Colorado Association of Public Employees

LIBRARY SERVICES

Auraria Library

Acting Director: Jean F. Hemphill
Acting Associate Director: Marilyn J. Mitchell
Associate Director for External Affairs: Margie Shugot
Assistant Director for Collection and Automation Services: Marilyn J. Mitchell
Assistant Director for Media and Telecommunications Services: Muriel E. Woods
Assistant Director for Instruction and Research Services: Camila Alire

Offices: Auraria Library, 11th and Lawrence Sts.
Telephone: —Administration: 556-2805
Telephone: —Information: 556-2741

Faculty:
Associate Professor: Jean F. Hemphill
Assistant Professors: Dene L. Clark, Patricia A. Eskoz, Brian D. Holtz, Elvira Mercado, Terry Ann Mood, Martin A. Tessmer, Robert L. Wick, Muriel E. Woods

Board of Directors, Friends of Auraria Library

Gail E. Bundy, U.S. West Marketing Resources Group
Lucy Creighton, First Interstate Bank
Claudia Allen Dillman, Gannett Outdoors
Nancy Ellins
David Howlett, The Denver Partnership
L.T. (Linn) Leeburg, Western Gas Supply Company
Darwin Niekirk, Adolph Coors Co.
Christopher G. Nims, Gensler & Associates
Duane D. Pearsall, Columbine Venture Funds
Joan Ringel, Colorado Association of Commerce and Industry
Stuart C. Rogers, S.C. Rogers, Inc.
Lester Woodward, Davis, Graham & Stubbs

Access to information is essential to academic success. The Auraria Library, located at the center of the campus, provides a wide range of learning resources and services to support academic programs. The Library is administered by the University of Colorado at Denver.

LIBRARY SERVICES

Auraria Library

Acting Director: Jean F. Hemphill
Acting Associate Director: Marilyn J. Mitchell
Associate Director for External Affairs: Margie Shugot
Assistant Director for Collection and Automation Services: Marilyn J. Mitchell
Assistant Director for Media and Telecommunications Services: Muriel E. Woods
Assistant Director for Instruction and Research Services: Camila Alire

Offices: Auraria Library, 11th and Lawrence Sts.
Telephone: —Administration: 556-2805
Telephone: —Information: 556-2741

Faculty:
Associate Professor: Jean F. Hemphill
Assistant Professors: Dene L. Clark, Patricia A. Eskoz, Brian D. Holtz, Elvira Mercado, Terry Ann Mood, Martin A. Tessmer, Robert L. Wick, Muriel E. Woods

Board of Directors, Friends of Auraria Library

Gail E. Bundy, U.S. West Marketing Resources Group
Lucy Creighton, First Interstate Bank
Claudia Allen Dillman, Gannett Outdoors
Nancy Ellins
David Howlett, The Denver Partnership
L.T. (Linn) Leeburg, Western Gas Supply Company
Darwin Niekirk, Adolph Coors Co.
Christopher G. Nims, Gensler & Associates
Duane D. Pearsall, Columbine Venture Funds
Joan Ringel, Colorado Association of Commerce and Industry
Stuart C. Rogers, S.C. Rogers, Inc.
Lester Woodward, Davis, Graham & Stubbs

Access to information is essential to academic success. The Auraria Library, located at the center of the campus, provides a wide range of learning resources and services to support academic programs. The Library is administered by the University of Colorado at Denver.
The Collection

The Auraria Library has a collection of over 60,000 volumes. In addition to a strong, up-to-date book collection, the Library also has over 2,000 journal and newspaper subscriptions and a film videotape collection. The Library is a select depository for U.S. government publications and a full depository for Colorado state documents. The Auraria Library's collection is supplemented by providing access to other libraries within the state and nationally through interlibrary loan services.

InfoColorado

InfoColorado is a database project developed and managed by the Library to collect and provide access to local economic development information, vital to the business and economic growth of the state. In April 1988, Governor Roy Romer designated the Auraria Library as the central clearinghouse for state economic development information, answering Colorado's need for ready access to accurate, coordinated, and systematically-developed information in such areas as labor and market profiles, economic trends and forecasting, statistical and demographic profiles, industry-specific business activity, and information to assist in the creation, expansion, and relocation of business in Colorado. The database currently contains abstracts of business and economics articles from major newspapers, journals, studies, and reports from across the state as well as references to agencies and organizations which create, analyze, and provide access to primary economic development data. Because InfoColorado is available through the online system of the Colorado Alliance of Research Libraries (CARL), it is accessible to library users statewide and through telephone dial-up from home or business computers anywhere in the country.

The Online Public Access Catalog

Access to the Auraria Library's collection is through the online Public Access Catalog (PAC), a user-friendly system that also allows for searching of the collections of many other libraries throughout the state. The online Public Access Catalog, which was developed as a cooperative project by the Colorado Alliance of Research Libraries, has received national recognition for being on the cutting edge of information technology. The online PAC system allows faster and more comprehensive searches than were possible with the traditional card catalog. In addition to using PAC at the Library, patrons may obtain dial-up access through a home or office computer with a modem; PAC also appears as a menu item on the CU-Denver mainframe computer.

Reference Services

The Auraria Library's reference department stands ready to assist students and faculty in using the Library's resources. The reference department is staffed during all times the Library is open. In addition, brief reference questions, such as whether or not the Library owns a particular item, can be answered over the phone.

Media Services

The Media and Telecommunications Division of the Library offers a full range of media services. The media distribution department manages the Library's media collection, which consists of videotapes, audiotapes, records, 16mm films, and kits. These materials are listed in the online Public Access Catalog. This department also houses media viewing and listening facilities. The Library operates an 18-channel television distribution system which is wired into all classrooms on campus; at a faculty member's request a film or videotape can be transmitted directly into the classroom over this system. This system also can transmit live programs from St. Cajetan's, the Student Union, and the Library's television studio to other locations on campus. A self-service graphics lab is also available for student use in the Media and Telecommunications Division and a professional graphic designer is available to assist users.

Computer Assisted Research

Online database searching, for which there is a fee, can save many hours of researching printed abstracts and indexes. In some cases, it provides the only access to certain materials. The Library has access to well over 200 databases. In addition to bibliographic information, many of the business databases also contain directory and financial information. Questions about the Computer Assisted Research service should be directed to the Library's reference department.

Information Retrieval Service

The information retrieval service was instituted as a special aid for busy researchers. For a reasonable fee, Library staff can assist patrons in locating and checking out the library materials they need. Working from the patron's bibliography, staff can locate and check out books owned by the Library; photocopy articles from journals owned by the Library; submit interlibrary loan requests for materials which the Library does not own; and deliver the materials to the patron's home or office. Inquiries about this time-saving service should be directed to the reference department.

Library Instruction

The Library is committed to educating people to meet the demands of the Information Society. The Library offers a wide range of instructional programming, including a self-paced audiotape walking tour of the Library, as well as class sessions to teach information access skills and strategies. Course content ranges from teaching skills needed to use a printed index to advanced research methodology for public affairs and other graduate students. All instructional programming is developed in conjunction with discipline faculty. For more information about the Library's instructional offerings contact the office of the Coordinator of Instructional Services at the Library.

Architecture and Planning Library

The Library's main collection is supplemented by the material housed at the nearby Architecture and Planning Branch Library. With a collection of over 13,000 books, 120 periodical subscriptions, and 14,000 slides, this branch library offers specialized information to students of architecture, interior design, landscape architecture, urban design, and planning. This branch library is open to any student who needs access to these materials.
Services for Persons with Disabilities

The Library is committed to making its resources and services available to all students. Through the media distribution department, a wide variety of adaptive equipment is available to assist persons with disabilities including a Kurzell Reading Machine, a Voyager VTEK magnifier, a Braille dictionary, the World Book Encyclopedia in Braille and on cassette, the Perkins Brailler, and several large print dictionaries. Library services to assist persons with disabilities include orientation to the physical layout of the Library, retrieval of materials, and assistance with use of the Public Access Catalog, periodicals indexes, and special adaptive equipment.

Additional Facilities

Coin-operated typewriters, a copy center, change machines, and study rooms are all available at the Library.

Internships

The Library offers internships, practicums, and independent studies to students interested in telecommunications or information management.
The Doctor of Philosophy (Ph.D.) in:
Applied mathematics
Educational administration, supervision and curriculum
Public administration

Significant course work is available at the Denver campus in the programs listed below. Students can be resident on the Denver campus studying in these areas in order to take advantage of the multcampus activities of The Graduate School. It is usually advised that a student complete some course work at another campus of the University.

Biology Chemical engineering
Chemistry Mechanical engineering
Communication Psychology
Computer science

The Graduate School at CU-Denver

An average of 4,358 students are enrolled in graduate programs at CU-Denver each fall and spring semester, which includes 1,186 non-degree students taking graduate courses. Of these, approximately 78 percent are part-time students.

Faculty

The faculty teaching in these programs are headquartered at CU-Denver, although resources of other University of Colorado campuses are used.

Computing Services

The Computing Services department supports computer use by both the academic and administrative communities at CU-Denver. For a complete description of services offered see Special Programs and Facilities in the General Information section of this catalog.

Financial Aid for Graduate Study

COLORADO GRADUATE GRANT

The Colorado Graduate Grant is administered by The Graduate School. Competition for these funds is based
on demonstrated need and is open to graduate students who are residents of the State of Colorado. Grant awards are announced each semester for the following semester. Applications are available from the Office of Financial Aid.

COLORADO GRADUATE FELLOWSHIPS

Colorado Graduate Fellowships are awarded primarily to entering and continuing regular degree doctoral students. These are awarded to entering students on the basis of academic promise, and to continuing students on the basis of academic success.

GRADUATE STUDENT TEACHING APPOINTMENTS

Many departments employ graduate students as part-time instructors or teaching assistants. The instructorship is reserved for those advanced graduate students already possessing an appropriate M.A. degree who may be independently responsible for the conduct of a section or course. Payment for these teaching appointments for 1990-91 is: instructor (20 hours per week), $8,930; teaching assistant (20 hours per week), salary range $5,381 - $7,080 for the academic year.

A half-time appointment for an instructor is considered to be equal to 6 class contact hours; a half-time teaching assistant is appointed for 20 hours per week. Compensation is based on the number of hours per week. Nonresident students employed as assistants may or may not be eligible for the nonresident tuition differential stipend for their first-year appointment as an assistant only. Exceptions extending beyond the first year must be approved in advance by the respective dean. Teaching assistants and instructors must be enrolled as full-time students (registered for at least 5 credit hours of mixed undergraduate/graduate/thesis or dissertation) in good standing for the full period of their appointment.

RESEARCH ASSISTANTSHIPS

Research activities provide opportunities for graduate students to obtain part-time work as research assistants in many departments. Nonresident students who are appointed as research assistants in nongeneral fund accounts may or may not be eligible for resident tuition rates. Assistants must be enrolled as full-time students (registered for at least 5 credit hours of mixed undergraduate/graduate/thesis or dissertation).

LOAN FUNDS

Graduate students wishing to apply for long-term loans and for part-time jobs through the college workstudy program should submit an Application for Financial Aid to the Office of Financial Aid by March 1. This office also provides short-term loan assistance to students who have completed one or more semesters in residence. Short-term loans are designed to supplement inadequate personal funds and to provide for emergencies. Applicants should go directly to the Office of Financial Aid.

EMPLOYMENT OPPORTUNITIES

The University maintains an employment service in the Office of Financial Aid to help students obtain part-time work either through conventional employment or through the college work-study program.

Students employed by the University are hired solely on the basis of merit and fitness, a policy which avoids favor or discrimination because of race, color, creed, sex, age, handicap, or national origin. Students are also referred to prospective employers in accordance with this policy.

International Education

The Office of International Education expedites the exchange of students and faculty, entertains foreign visitors, promotes special relationships with foreign universities, and acts as advisor for Fulbright and other scholarships.

The office also arranges study abroad programs. Students remain enrolled at the University of Colorado while taking regular courses in the foreign universities. A B average with the equivalent of two years of college-level work in the appropriate language is required. There are also occasional summer programs offering academic credit.

Peace Corps information may be obtained from the Office of International Education.

For additional information contact the Office of International Education, Boulder campus, 492-7741, or the Office of International Programs, Auraria Higher Education Center, 556-3660.

REQUIREMENTS FOR ADMISSION

General Requirements

Students may be admitted to The Graduate School in either of the two categories described below.

Admission to The Graduate School is not admission to candidacy for an advanced degree. A student who wishes to become a candidate for a degree must make special application at the time and in the manner prescribed by the requirements for the degree sought.

The University reserves the right to deny admission to applicants whose total credentials reflect an inability to assume those obligations of performance and behavior deemed essential by the University and relevant to any of its lawful missions, processes, and functions as an educational institution.

REGULAR DEGREE STUDENTS

Qualified students are admitted to regular degree status by the appropriate department. In addition to departmental approval, applicants for admission as regular degree students must:

1. Hold a baccalaureate degree from a college or university of recognized standing, or have done work equivalent to that required for such a degree and equivalent to the degree given at this university.
2. Show promise of ability to pursue advanced study and research, as judged by their previous scholastic record.
3. Have had adequate preparation to enter graduate study in the field chosen.
4. Have at least a 2.75 undergraduate grade-point average on all work taken.
5. Meet additional requirements for admission as established by major departments.

Regular degree students must maintain at least a 3.0 grade-point average each semester or summer term on all work taken, whether it is to be applied toward the intended advanced degree or not. Students who fail to maintain this standard of performance will be subject to suspension from The Graduate School.

PROVISIONAL DEGREE STUDENTS

Applicants who do not meet the requirements for admission as regular degree students may be admitted as provisional degree students upon the recommendation of the major department. Upon the recommendation of the Admissions Committee and concurrence of the
Suspended Students

A suspended student is eligible to apply for readmission after one year. Approval or rejection of this application rests jointly with the student's major department and the dean. In case of lack of agreement between the department and the dean or in the case of appeal by the student, the final decision will be made by the Executive Committee.

Foreign Applicants

Prospective foreign students should have completed applications on file in The Graduate School office prior to December 1 for the Summer Term, March 1 for the Fall Semester, and July 1 for the Spring Semester. The application packet should include the $50 fee, TOEFL scores, financial documentation, Graduate Record Examination scores, official English translation of all school records, and other documents as noted in the previous section on Application Procedures.

Acceptable TOEFL Scores. The TOEFL is the Test of English as a Foreign Language. If your native language is not English, or you have not attended a British or American university for at least one year and achieved satisfactory grades, then you must take the TOEFL. All programs within CU-Denver's Graduate School—arts and sciences, education, engineering, and doctoral programs—require a minimum score of 525 for regular admission. Those earning less than 525 will normally be referred to the Spring International Language Center (on campus) for further language study. During that time, these students will study on an I-20 from Spring, but may take classes as non-degree students at CU-Denver. They may subsequently be granted regular admission to The Graduate School. All international students who take the TOEFL and are granted regular admission to CU-Denver's Graduate School will be asked to take both the Michigan and SPEAK tests during their first semester of study. Those whose TOEFL fell between 525 and 550 will be required to take additional language training in light of whatever deficiencies may be revealed by these diagnostic tests. Those whose TOEFL exceed 550 will be encouraged, but not required, to undertake additional training in light of their performance on these tests. Students seeking admission to all other graduate programs, including those in architecture and planning, business, and public affairs, should consult those program descriptions for language requirements.

Graduate Record Examinations

At the option of any department, the Graduate Record Examination may be required of applicants for admission to the

Graduate Procedures

Graduate students who expect to study at CU-Denver should contact the CU-Denver Graduate School office concerning procedures for forwarding completed applications.

An applicant for admission must present a completed Application Form (Parts I and II), which may be obtained from the CU-Denver Graduate School office, and two official transcripts from each institution attended. The application must be accompanied by a nonrefundable application fee of $30 (check or money order) when the application is submitted. No application will be processed unless this fee is paid.

Many departments require scores from the Graduate Record Examination, and all departments require three or four letters of recommendation.

When a prospective degree student applies for admission, the chairperson of each department or a committee named for the purpose shall decide whether the applicant shall be admitted and shall make that decision known to The Graduate School dean's office, which will inform the student. Persons not wishing to work toward an advanced degree are referred to as non-degree students (see Non-Degree Students in this section).

A completed application must be in the office of the major department at least 90 days prior to the term for which admission is sought or earlier as may be required by the major department.

Students who wish to apply for a graduate student award for the academic year 1990-91, e.g., fellowship, scholarship, assistantship, etc., must file a completed application with the department before the announced departmental deadline (see previous section on financial aid).

Re-Admission of Former and Suspended Students

Students who were previously admitted to a graduate degree program but who did not complete that degree program and who have not been registered for one year or more at the University must:

1. Clarify their status with either the department or The Graduate School to determine their eligibility to return and pursue the same degree.

2. After receiving departmental approval, as indicated above, submit a new application Part I to The Graduate School office before deadlines are passed for the term in which they expect to return to the University. A $30 application fee is required unless an exception is given by The Graduate School. Application deadlines are available from the department.

Former students who wish to change from undergraduate to graduate status or from one major to another must apply to the new department.

Students transferring from one campus to another must apply and be accepted to the new campus.

A student admitted to The Graduate School for the master's program must reaply for the doctoral program.

A suspended student is eligible to apply for readmission after one year. Approval or rejection of this application rests jointly with the student's major department and the dean.
REGISTRATION

Course Work and Examinations

On the regular registration days of each
semester, students who have been admit­
ted to The Graduate School and who
expect to study in The Graduate School
are required to complete appropriate
registration procedures.

Students should register for classes the
semester they are accepted into The
Graduate School. If unable to attend that
semester they must notify the department
that has accepted them and submit the
necessary forms to the Office of Admis­
sions and Records at CU-Denver in order
to attend the following semester.

Changes in Registration

A student who wishes to drop a course
or take it for no credit should follow
the drop/add standard procedure (see current
Schedule of Classes). After the tenth week
of classes graduate students may not drop,
add, or change a course to no credit
without presenting a letter to the dean of
their college, CU-Denver, stating the
exceptional circumstances that justify the
change. This letter, endorsed by the
instructor of the course, must accompany
the properly signed and completed
drop/add card or no-credit option form.

Withdrawal

Graduate students who desire to
withdraw from the University must apply
to the dean of their college for permission
to withdraw in good standing. A student
who discontinues attendance in a course
without official withdrawal will be
marked as having failed the course. The
withdrawal form must be signed by the
instructor of the course and pass/fail
must be indicated with the instructor's
initials.

Master's Thesis

Graduate students working toward
master's degrees, if they expect to present
a thesis in partial fulfillment of the
requirements for the degree, must register
for thesis for a minimum of 4 semester
hours or a maximum of 6 semester hours.
The final grade will be withheld until the
thesis is completed. If the thesis is not
completed at the end of the term in
which the student is registered, an in
progress (IP) will be reported. (The stu­
dent may not register again for any por­
tion of thesis credit on which an IP grade
has been submitted.)

Limitation of Registration

FULL LOAD

A graduate student will be considered to
be carrying a full load during a regular
semester for purposes of determining
residence credit if the student is registered
for at least 5 credit hours of mixed
undergraduate/graduate/thesis or disser­
tation hours.

A maximum of two-thirds of a semester
of resident credit may be earned during
the summer if a student registers for three
semester hours of other graduate work, or
any number of thesis hours.

For the number of hours required for
financial aid see Financial Aid at the
University of Colorado at Denver in the
General Information section of this
catalog. A graduate student may contact
the dean's office for information on the
appeal process regarding the full load
requirement for financial aid purposes.

MAXIMUM LOAD

No graduate student may receive credit
toward a degree for more than 15 hours
in a regular semester.

The maximum number of graduate
credits that may be applied toward a
degree during a summer term at CU­
Denver is 10 hours per 10-week summer
term. A graduate student may contact the
dean's office for information on the appeal
process regarding an overload.

UNIVERSITY EMPLOYEES

Full-time employees of the University
may not undertake more than 6 credit
hours per semester. Part-time employees,
including assistants, may take such work
as is approved by the major departments.

TUITION AND FEES

The schedule of tuition and fees is given
in the General Information section of this
catalog.

REQUIREMENTS FOR
ADVANCED DEGREES

Quality of Graduate Work

Although the work for advance degrees
is specified partly in terms of credit hours,
an advanced degree will not be conferred
merely for the completion of a specified period of residence and the passing of a given number of courses. Students should not expect to obtain all the training, knowledge, and grasp of ideas necessary to meet the requirement for an advanced degree from formal courses. They should work on their own initiative, reading widely and thoughtfully, reaching their own conclusions, and acquiring a sense of values, perspective, proportion.

All studies offered for credit toward an advanced degree (except those in deficiencies) must be of graduate status.

A student is expected to maintain at least a B average in all work attempted while enrolled in The Graduate School.

For the Ph.D., a course mark below B is unsatisfactory and will not be counted toward fulfilling the minimum requirements for the degree.

A student who fails to do satisfactory work will be subject to suspension from The Graduate School by the dean with the approval of the major department.

Appeal may be made to the Executive Committee of The Graduate School. The committee’s decision shall be final. A suspended student is eligible to apply for readmission after one year. Approval or rejection of this application rests jointly with the student’s major department and the dean. In case of appeal by the student, the final decision will be made by the Executive Committee.

Repeating a Course

A graduate student who receives a grade of C, D, or F in a course may repeat the course once, upon written recommendation to the dean by the chairman of the student’s advisory committee and major department, provided the course has not previously been applied toward a degree.

In calculating a student’s grade-point average for Graduate School purposes, the grade for a repeated course will substitute for the old grade. Grades earned in courses taken as an undergraduate or as a non-degree student, as well as grades earned in first and second year foreign language courses, will not be used in calculating The Graduate School grade-point average; however, all grades received will appear on the student’s transcript.

Change of Department or Major

A graduate student wishing to change department or major must submit a new Part I and Part II of the graduate application to the new department or school and request the former department to forward recommendations and credentials. The student must be formally accepted by the new department.

Use of English

A student who is noticeably deficient in the use of good English in all oral and written work may not obtain an advanced degree from the University of Colorado. Ability to use the language with precision and distinction should be cultivated as an attainment of major importance.

Each department will judge the qualifications of its advanced students in the use of English. Reports, examinations, and speech will be considered in estimating the candidate’s proficiency.

Graduate Appeals

Final action on appeals submitted by graduate students concerning action taken by faculty members, programs, or administrative officials rests with the campus Executive Committee of The Graduate School, unless such appeal involves a matter affecting two or more campuses. In such a case, the final action rests with the Executive Committee of The Graduate School.

MASTER’S DEGREE

A student regularly admitted to The Graduate School and later accepted as a candidate for the Master of Arts, Master of Science, or other master degrees will be recommended for the degree only after the following requirements have been met.

In general, only graduates of an approved institution who have a thorough preparation for their proposed field of study and who do graduate work of high quality are able to attain the degree with the minimum amount of work specified below. All studies offered toward the minimum requirement for the degree must be of graduate rank. Necessary additional work required to make up deficiencies or prerequisites may be partly or entirely undergraduate courses.

The requirements stated below are minimum requirements; additional conditions set by the department will be found in the announcements of separate departments. Any department may make further regulations not inconsistent with the general rules.

Students planning to graduate should ascertain current deadlines of The Graduate School. It is the graduate student’s and the department’s responsibility to see that all requirements and deadlines are met (i.e., changing of IV grades, notifying The Graduate School of final examinations, etc.).

Departments or program committees may have additional deadlines that must be met by the graduate students in that department or program. It is the student’s responsibility to ascertain such requirements and to meet them as designated by the department or program chair.

Minimum Requirement

The minimum requirement of graduate work for the degree Master of Arts or Master of Science may be fulfilled by following either Plan I or Plan II below.

Plan I: By presenting 24 semester hours of graduate work, including a thesis. At least 12 semester hours of this work must be at the 5000 level or above.

Plan II: By presenting 30 semester hours of graduate work, without a thesis. At least 16 semester hours of this work must be at the 5000 level or above.

Plan II does not represent a free option for the student. A candidate for the master’s degree may be allowed to select Plan II only on the recommendation of the department concerned.

Graduate Credit

Graduate credit is given for courses that are listed at the 5000 level or above and that are offered by professors who are members of the graduate faculty, or that have otherwise been approved by the dean of The Graduate School. No assurance can be given that work taken by a student will count toward a higher degree unless the student has the approval of the department.

Not all courses listed are available at any one time; some of them are given in alternate years.

Courses taken during the Fall Semester 1975 and thereafter will have graduate rank if they are taught by members of The Graduate School faculty and are in one of the following two categories:

1. Courses within the major program at the 5000 level or above.
2. Courses outside the major program at the 4000 level provided they are approved for a specific degree plan by the faculty of the degree-granting program and by the campus graduate dean.
3. The Master of Basic Science program (M.B.S.) has approval for 3000- and 4000-level courses if approved by the department and the dean of The Graduate School.
4. Courses outside the major program
provided they are approved for a specific degree plan by the faculty of the degree-granting program and by the campus graduate dean.

This does not change the minimum number of courses that must be taken at the 3000 level or above; however, as a result, most students who include 4000 level courses of other departments in their program will not exceed those minimum requirements for graduation.

Field of Study

Studies leading to a master’s degree may be divided between major and minor subjects at the discretion of the faculty of the degree-granting program.

Status

After students have made a satisfactory record in this University for at least one semester or summer term, and after they have removed any deficiencies that were determined at the time of admission or by qualifying examinations or otherwise, they should confer with their major department and request that a decision be made on their status. This definite status must be set by the major department before students may make application for admission to candidacy for an advanced degree.

Students who are inadequately prepared must make up without credit toward a graduate degree all prerequisites required by the department concerned.

Language Requirements

Candidates must have such knowledge of ancient and modern languages as each department requires. See special departmental requirements.

Credit by Transfer

Resident graduate work of high quality done in a recognized graduate school elsewhere and coming within the time limit may be accepted up to a limited amount, provided it is recommended by the department concerned and approved by the dean of The Graduate School.

Course work taken more than 6 years prior to the completion of final requirements (comprehensive exam and/or filing of thesis) will not be accepted for the degree unless validated by a special examination. The maximum amount of work that may be transferred to this University is 9 semester hours. Credit will not be transferred until the student has established in The Graduate School of this University a satisfactory record of at least one semester in residence; such transfer will not reduce the residence at this University, but it may reduce the amount of work to be done in formal courses. Requests for transfer of credit to be applied toward an advanced degree must be made on the form specified for this purpose and submitted to The Graduate School by the beginning of the semester prior to that in which the student will be graduated.

Work already applied toward a master’s degree received from another institution cannot be accepted for transfer toward the master’s degree at the University of Colorado; extension work completed at another institution cannot be transferred; and correspondence work, except to make up deficiencies, is not recognized.

Excess undergraduate credits from another institution may not be transferred to The Graduate School. Seniors in this University may, however, transfer a limited amount of advanced resident work (up to 9 semester hours) provided such work:
1. Is completed with distinction in the senior year at this University.
2. Comes within the four-year time limit.
3. Has not been applied toward another degree.
4. Is recommended for transfer by the department concerned and approved by the dean of The Graduate School.

Requests for transfer of credit to be applied toward an advanced degree must be made on the form specified for this purpose and submitted to The Graduate School by the beginning of the semester prior to that in which the student will be graduated. For more information contact The Graduate School office. To be eligible for courses to be considered for transfer, a student must have an overall B average in all courses taken at the University of Colorado in The Graduate School.

Continuing Education Course Work

Students may use the resources of the Division of Extended Studies in the pursuit of graduate study only if they obtain proper academic approval from the major department and the graduate dean in advance.

Residence

In general, the residence requirements can be met only by residence at the University for at least two semesters or at least three summer terms. For full residence a student must be registered within the time designated at the beginning of a semester and must carry the equivalent of not fewer than 5 semester hours of work in courses numbered 5000 or above, or at least a combination of other course work acceptable for graduate credit. See Limitation of Registration, Full Load, for requirements for full residence credit during the summer. Students who are noticeably deficient in their general training, or in the specific preparation indicated by each department as prerequisite to graduate work, cannot expect to obtain a degree in the minimum time specified.

Assistant and other employees of the University may fulfill the residence requirements of one year in two semesters, provided their duties do not require more than half time. Full-time employees may not satisfy the residence requirements of one year in fewer than four semesters.

Admission to Candidacy

A student who wishes to become a candidate for a master's degree must file application in the dean's office not later than 10 weeks prior to the completion of the comprehensive final examination. The number of hours to be presented for the degree must be determined before this application may be filed. See previous section on Status.

This application must be made on forms obtainable at the dean's office and in various departments and must be signed by the major department, certifying that the student's work is satisfactory and that the program outlined in the application meets the requirements set for the student.

A student on Graduate School probation is not eligible to be awarded a degree until he or she is removed from probation.

Thesis Requirements

A thesis, which may be of a research, expository, critical, or creative type, is required of every master's degree candidate under Plan I. Every thesis presented in partial fulfillment of the requirements for an advanced degree must:
1. Deal with a definite topic related to the major field.
2. Be based upon independent study and investigation.
3. Represent the equivalent of from 4 to 6 semester hours of work.
4. Receive the approval of the major department not later than 30 days (in
some departments, 90 days) before the commencement at which the degree is to be conferred.

5. Be essentially complete at the time the comprehensive final examination is given.

6. Comply in mechanical features with specifications outlined in University of Colorado Graduate School Specifications for Preparation of Master's Theses and Doctoral Dissertation, which is obtainable from The Graduate School.

Two weeks prior to the date on which the degree is to be conferred, two formally approved, printed or typewritten copies of the thesis must be filed in The Graduate School. The thesis must be complete with abstract.

All theses must be signed by the thesis advisor and the second reader. All approved theses are kept on file in the library. The thesis binding fee must be paid when the thesis is deposited in The Graduate School.

Credit hours earned for the thesis will not be accepted toward the requirements for a degree unless such credit has previously been registered. A student working toward a master's degree must register for thesis for a specific number of hours. The student may register for any specific number of hours in any semester of residence; but the total registered credit for thesis must total a minimum of 4 or a maximum of 6 semester hours, the total number of hours depending upon how much credit is to be given for the thesis. The final grade will be withheld until the thesis is approved and is complete. An IP (in progress) will be reported for terms during which the student is registered for thesis prior to completion of the thesis.

Comprehensive Final Examination

All candidates for a master's degree are required to take a comprehensive final examination after the other requirements for the degree have been completed. This examination may be given near the end of their last semester of residence while they are still taking required courses for the degree, provided they are making satisfactory progress in those courses.

The following rules applying to the comprehensive final examination must be observed:

1. Students must be registered when they take the examination.
2. Notice of the examination must be filed by the major department in the dean's office at least three days in advance of the examination.
3. The examination is to be given by a committee of three graduate faculty members appointed by the department concerned in consultation with the dean.
4. The examination, which may be oral or written, or both, must cover the thesis, which should be essentially complete at the time, as well as other work done in the University in formal courses and seminars in the major field.

5. An examination in the minor work taken at this University is optional with the major and minor departments.

6. The examination must include all work presented for the degree not done in residence at the University of Colorado, whether in the major or minor field. The examination on transferred work will be given by representatives of the corresponding fields of study in this University.

Candidates Expecting to Graduate During 1990-91

Deadline dates for the following can be obtained by calling The Graduate School office, 356-2663.
1. Last day for requesting transfer of credit.
2. Applications for admission to candidacy. Applications must be submitted at least 10 weeks before the student expects to take the comprehensive final examination. Students are urged to submit this form by the beginning of the semester prior to that in which they expect to receive the degree. (The form may be picked up in the department or in The Graduate School office.)
3. Last day for thesis to be approved by department.
4. Last day for scheduling of comprehensive final examination.
5. Last day for taking comprehensive final examination.
6. Last day for filing thesis in The Graduate School. At the time of filing, the thesis must be complete in all respects and must meet thesis specifications in order to be accepted by The Graduate School. Candidates whose theses are

Time Limit

Master's degree students have 4 years, from the date of the start of course work, to complete all degree requirements. For students who fail to complete the degree in this 4 year period, it will be necessary for the program director to file an annual statement with the graduate dean stating the reasons why the program faculty believe the student is making adequate progress and should be allowed to continue in the program. Students who do their work exclusively in summer terms must complete all degree requirements within 72 months from the start of course work.

A student who does not complete all degree requirements within the specified period of time must validate, by special examination(s), any course work taken more than 6 years prior to taking the masters comprehensive examination or completing the thesis defense, depending on which plan is elected.
received after 5 p.m. on the indicated date will be graduated at the commencement following that for which the deadline is indicated.

**DOCTOR OF PHILOSOPHY**

The Doctor of Philosophy (Ph.D.) degree is the highest academic degree conferred by the University. To state the requirements for the degree in terms of credit hours would be misleading because the degree is not conferred merely upon the satisfactory completion of a course of study, however faithfully pursued. Students who receive this degree must demonstrate that they are proficient in some broad subject of learning and that they can critically evaluate work in this field; furthermore, they must have shown the ability to work independently in their chosen field and must have made an original contribution of significance to the advancement of knowledge. The technical requirements stated below are minimal requirements for all candidates for the degree; additional conditions set by the departments will be found in the announcements of separate departments. Any department may make additional regulations consistent with these general rules.

Studies leading to the Ph.D. degree must be chosen so as to contribute to special competence and a high order of scholarship in a broad field of knowledge. A field of study chosen by the student may be in one department or it may include two or more closely related departments. The criterion as to what constitutes an acceptable field of study shall be that the student's work must contribute to an organized program of study and research without regard to the organization of academic departments within the University.

Students planning to graduate should obtain current deadline dates in the office of The Graduate School. It is the graduate student's and the department's responsibility to see that all requirements and deadlines are met (i.e., changing of IV grades, notifying The Graduate School of final examinations, etc.).

Department or program committees may have additional deadlines that must be met by graduate students in that department or program. It is the student's responsibility to ascertain such requirements and to meet them as designated by the department or program chair.

**Minimum Course/Dissertation Requirements**

A minimum of 30 semester hours of graduate courses and 30 semester hours of dissertation credit are required for the Ph.D. degree.

**Course Work Requirement.** A minimum of 30 semester hours of courses numbered 5000 or above is required for the degree, but the number of hours of formal courses will ordinarily exceed this minimum. At least 20 of the required hours must be in graduate courses taken at this University. Students who have been admitted to The Graduate School with deficiencies may expect to receive little or no residence credits until the deficiencies have been removed.

**Dissertation Hours Requirement.** To complete the requirements for the Ph.D., a student must register for a total of at least 30 hours of doctoral dissertation credit, with not more than 10 of these credit hours in any one semester. Not more than 10 dissertation hours may be taken preceding the semester of taking comprehensive examinations. In addition, up to 10 hours may be taken in the semester in which the student passes comprehensive examinations. Dissertation credit does not apply toward the minimum 30 hours of required course work specified above and will not be included in calculation of the student's grade-point average. Only the grades of A, B, C and IP shall be used.

Course work and work on dissertation may proceed concurrently throughout the doctoral program; however, at no time shall a doctoral student register for more than 15 hours of 5000-level and above courses. Normally a student must have earned at least three and not more than six semesters of residency before admission to candidacy.

**Advisory Committee**

As soon as the field of specialization has been chosen, the candidate will request the faculty member with whom the committee wishes to work to act as chair of the advisory committee. The chair, with the advice and approval of the chair of the department, may select two or more others to serve on the committee, so that the several fields related to the student's special interest will be represented. A purpose of the advisory committee (beyond guiding the student through graduate study) is to ensure against specialization that is too narrow. The student shall obtain the signature of the chair of the committee (thereby signifying his or her willingness to act) on the Application for Admission to Candidacy form. Any change in the membership of the advisory committee is to be similarly reported.

**Residence**

The student must be properly registered to earn residence credit. The minimal residence requirement shall be six semesters of scholarly work beyond the attainment of an acceptable bachelor's degree. Mere attendance shall not constitute residence as the word is here used. Residence may be earned for course work completed with distinction, for participation in seminars, or for scholarly research performed here or elsewhere under the auspices of the University of Colorado.

As a guiding policy in determining residence credit for employed students, those who are employed in three-fourths to full-time work that does not contribute directly to their program toward a degree may not earn more than one-half residence credit in any semester. Students who are employed more than one-fourth time and less than three-fourths time in work that does not contribute directly to the degree may earn not more than three-fourths residence credit. Those who have one-fourth time employment or less may earn full residence credit. (All these provisions are subject to the definition of residence credit given in the preceding paragraph.) In case the interpretation of residence credit for any student needs to be clarified, a decision will be made by the chair of the student's advisory committee, the chair of the student's major department, and the dean of The Graduate School.

Two semesters of residence credit may be allowed for a master's degree from another institution of approved standing, but at least four semesters of residence credit, two of which must be consecutive in one academic year, must be earned for work (course and/or dissertation) taken at this University.

A part of the residence requirement for the Ph.D. degree may be spent in another graduate institution, or if field work in absence (provided that prior approval for work is given by the student's program director and provided that the student's registration is maintained for that period away from the campus).

**Preliminary Examination**

Each department will satisfy itself (by examination or other means) that students who signify intent to undertake study for the Ph.D. degree are qualified to do so.
The means by which each department makes this evaluation shall be specified in departmental requirements. Students who are thus evaluated will be notified immediately of the results. The results of this preliminary evaluation shall be reported to The Graduate School office on the Application for Candidacy form filed by the student at least two weeks before the comprehensive examination is attempted.

Language Requirement

Students are required to meet the following language requirements.

Communication Requirement. All graduate students for whom English is the native language are required to demonstrate at least second-year college proficiency in a foreign language of their choice. This requirement may be satisfied in the following ways:

1. The student's undergraduate transcript may be presented, showing completion of grade C or better of at least 3 semester hours of a fourth-semester undergraduate college course in a foreign language. The transcript must accompany the student's Application for Admission to Candidacy when it is submitted to The Graduate School.

2. The student may take The Graduate School Foreign Language Test (GSFLT) at the Testing Office before or after admission to The Graduate School. Students should check with The Graduate School for the passing score required for each language.

3. If the student wishes to demonstrate competence in a language for which the GSFLT is not available, a test designed and administered by the appropriate language department at the University of Colorado may be taken, with the passing criterion to be set comparable to the above GSFLT criterion.

4. The student may register at the University for any fourth-semester course in a foreign language and pass it with a C or better. (Registration in such courses is contingent upon the department's approval.)

A student who elects 2, 3, or 4 above must complete the requirements before the Ph.D. comprehensive examination may be scheduled.

Students whose native language is not English will, by passing their courses and completing their graduate work at the University, demonstrate sufficient ability in English to meet the communication requirement.

Special Languages. When special languages are needed as tools to read foreign literature in a particular field, the individual academic departments may require further training in foreign languages for all their Ph.D. graduate students. The choice and number of languages as well as the required levels of skill and the methods of testing these skills are determined by the individual departments.

Credit by Transfer

Resident graduate work of high quality earned in another institution of approved standing will not be accepted for transfer to apply toward the doctorate until the student has established in this Graduate School a satisfactory record in residence, but such credit must be transferred before the student makes application for admission to candidacy for the degree. Such transfer will not reduce the minimum residence requirement at this University, but it may reduce the amount of work to be done in formal courses.

The maximum amount of work that may be transferred to this University for the Ph.D. is 10 semester hours.

Application for Admission to Candidacy

A student must make formal application for admission to candidacy for the Ph.D. degree on forms supplied by The Graduate School office at least two weeks before the comprehensive examination is attempted.

A student shall have earned at least three semesters of residence, shall have passed the language requirements, and shall have passed the comprehensive examination before admission to candidacy for the degree.

Continuous Registration Requirements for Doctoral Candidates

Following successful completion of comprehensive examinations, students must register continuously. Students admitted to candidacy for degree will register for and be charged for 10 hours of credit for each full-time term of doctoral work. For each term of part-time enrollment, students will be charged for 7 hours of dissertation credit, except that students not making use of campus facilities may petition The Graduate School for 3-credit-hour status. Continuous registration during the academic year will be required until completion of the dissertation defense. It is expected that the student and advisor will consult each semester as to the number of hours for which the student will register, consistent with the classification identified above.

If a student who is certified for the Ph.D. degree, or who has received permission to take the comprehensives and passes them prior to meeting the language requirement must be continuously enrolled as stated above. This continuing registration is independent on whether the candidate is in residence at the University. (See also section on Residence.)

Comprehensive Examination

Before admission to candidacy for the Ph.D. degree, the student must pass a comprehensive examination in the field of concentration and related fields. This examination may be oral, written, or both, and will test the student's mastery of a broad field of knowledge, not merely the formal course work completed. The oral part is open to members of the faculty. The student must be registered at the time the comprehensive examination is attempted.

The examination shall be conducted by an examining board appointed by the chair of the department concerned and be approved by the campus graduate dean. The board shall consist of the advisory committee and additional members as necessary to a minimum of five. A successful candidate must receive the affirmative votes of a majority of the members of the examination board. In case of failure, the examination may be attempted once more after a period of time determined by the examining board.

Dissertation Requirements

A thesis based upon original investigation and showing mature scholarship and critical judgment as well as familiarity with tools and methods of research must be written upon a subject approved by the student's major department. To be acceptable, this dissertation should be a worthwhile contribution to knowledge in the student's special field. It must be finished and submitted in typewritten form at least 30 days (in some departments, 90 days) before the day of the final examination and must be formally approved and made available for inspection by the examining committee before the final examination may be taken.

In mechanical features all dissertations must comply with the specifications of The Graduate School as outlined in the University of Colorado Graduate School.
Specifications for Preparation of Master's Theses and Doctoral Dissertation, which may be obtained from The Graduate School.

It is the student's responsibility to notify The Graduate School of the exact title of the dissertation at least six weeks prior to the commencement at which the student will graduate. This title will be printed in the commencement program.

Two formally-approved, typewritten copies of the dissertation, including abstract, plus one additional copy of the title page and abstract must be filed in The Graduate School office at least two weeks before the date on which the degree is to be conferred.

The abstract, not to exceed 350 words, will be published in Dissertation Abstracts International. The determination of what constitutes an adequate abstract shall rest with the major department.

All dissertations must be signed by no fewer than two members of the major department staff who are regularly engaged in graduate instruction.

All approved dissertations are kept on file in the library.

When the dissertation is deposited in The Graduate School, the candidate must pay the thesis-binding fee and sign an agreement with University Microfilms International to allow for publication in Dissertation Abstracts International; and to grant University Microfilms International the right to reproduce and sell (a) copies of the manuscript in microform and/or (b) copies of the manuscript made from microform. The author retains all rights to publish and/or sell the dissertation by any means at any time except by reproduction from negative microform.

Final Examination

After the dissertation has been accepted, a final examination of the dissertation and related topics will be conducted. This examination will be wholly or partially oral, the oral part being open to anyone. The examination will be conducted by a committee appointed by the campus graduate dean, which will consist of at least five persons, one of whom must be from outside the student's department. More than one dissenting vote will disqualify the candidate in the final examination.

Arrangements for the final examination must be made in the dean's office at least two weeks in advance. The examination must be scheduled not later than two weeks before the date on which the degree is to be conferred. A student must be registered at the time of the final examination.

Time Limit

If a student fails to complete all requirements for the degree within the prescribed number of years from the date of the start of course work in the doctoral program, a second examination similar to the first will be required before the candidate may take the final examination. The number of years allowed for completion is normally six, but in some programs it may be seven. If the comprehensive examination is failed, it may be attempted once more after not fewer than eight months of further work. For students who fail to complete the degree in this six-year period, it will be necessary for the department to file an annual statement why the program director believes the student is making adequate progress and should be allowed to continue in the program. This request must be signed by three members of the graduate faculty who serve on the student's thesis advisory committee. If approved by the campus graduate dean, the student may continue his/her studies for one additional year. If not approved, the student may be dropped from the program.
School of Architecture and Planning

Dean: H. A. Shirvani
Associate Dean: Yuk Lee
Assistant to the Dean: Donna Lee, Judy Strecker
Office: DR, Third Floor
Telephone: 556-3382

School Advisory Council 1990-91:
Chairman: Jerome Seracuse, FAIA,
Seracuse Lawler & Partners, Architects,
Denver
Members:
John Anderson, FAIA, Anderson Mason
Dale, Denver
Peter Dominick, AIA, Urban Design Group,
Denver
Alan Gerstenberger, President, Cambridge
Development Corp., Denver
Mimi Hillen, ASID, Hillen Design
Associates, Golden
Donald E. Hunt, BRW, Denver
Mark Johnson, ASLA, Civitas, Denver
John Madden, Chairman of the Board,
John Madden Company, Denver
Dick Marshall, DHM, Inc., Denver
Jennifer Moulton, AIA, Anthony Pellecchia
Architects, Denver
Chris Nims, AIA, Gensler and Associates,
Denver
Maxwell L. Saul, AIA, FCSI, DMJM, Denver
Floyd Tanaka, AICP, THK Associates,
Englewood
Joseph Wells, AICP, Doremus and Wells,
Aspen
William Wenk, FASLA, William Wenk
and Associates, Denver

INFORMATION ABOUT THE SCHOOL

The School of Architecture and Planning offers first and post professional programs leading to master's degrees. The primary mission of the School is education, research, and development of arts and sciences of architecture and planning. Students are required to search into the existing abundance of architecture and planning knowledge in order to generate effective, forceful, spirited forms, ideas, and proposals. Faculty and students are engaged in investigation, education, exploration, and generation of new ideas, forms, and proposals to create more humane living environments. As El Lissitzky (1930) stated: "Our work is not philosophy; neither is it a system relating to a specific theory of nature; it is part of nature and must therefore itself be regarded as an object of knowledge."

In doing so, the School questions existing connections of teaching and practice and is in search of future alternatives. The School's activities are thus geared toward preparation of future architects and planners who are not only able to draw, to calculate, or to propose, but also to question, to explore, and to experiment.

The curricula are based on a wide range of cultural views of architecture and planning reflective of our faculty and student body. The faculty direct, guide, and encourage students to develop their individual interests with a prerequisite commitment intended to equip the graduate with a lasting ability to produce architecture and planning responsive to the changing needs of society.

It is on these premises that our School is in constant search of the manifest, ideas, and forms for the betterment of the living environments. A community of culturally diverse educators and practitioners centered in an island by the backdrop of the Rocky Mountains provides a unique opportunity for intense study of architecture and planning.

Mission and Organization

The School is composed of three graduate degree programs in architecture, landscape architecture, and urban and regional planning (M.Arch., M.L.A., M.U.R.P.). It also offers urban design as an area of specialization in the architecture program (M.Arch. in Urban Design). As a unit of graduate professional education with three professional degree programs and a mandate for national excellence and recognition, the School expects to go beyond training students in basic skills for entry-level positions. The School's overall mission is to develop the design capabilities of the individuals and the design professions as a whole as well as provide the intellectual framework which supports design.

Considering this mission, the School emphasizes basic professional training and education necessary for entering professional practice in its first professional degree programs. The post-professional and advanced degree programs are directed toward professionals at various career stages and focuses on research and specialization.

The School supports interdisciplinary work in its programs and focuses on professional education and research concerning the design and planning of the built environment. Within this interdisciplinary approach, it recognizes the professional community input and the role of the other academic disciplines such as humanities, social sciences, and engineering.

In the School's degree programs, various architecture and planning ideologies and views are examined with respect to their historical setting. This examination is combined with critical reviews of design work, dialogues, and methods to form the essential ingredient of design education. Through this dialectic of analyzing and synthesizing, students gain increased understanding of those humanistic ideals underlying the architecture and planning of buildings and spaces and relate them to their own developing personal aspirations.

The School is committed to design as its central intellectual concern and is the largest graduate school of architecture in the western region. Design is used in its broadest sense to include a full range of philosophies, ideologies, theories, and methods. The School's mission is education, research, and development of arts and sciences of architecture and planning.

Academic Programs

The three graduate programs are interdisciplinary, and, in the design fields, both first and post professional degrees are offered. In addition, it is possible for students to obtain two degrees, M.Arch. and M.U.R.P. for example, and reduce the time required for doing so by coordinating their programs.

The first professional degree programs are structured for full-time graduate study. For students with employment obligations, most of these programs can be taken on a part-time basis. Usually the first year of the full-time program must be completed before it can be taken part-time.

Within any of the programs, the School of Architecture and Planning offers opportunities to develop a self-tailored area of
concentration through its varied offerings in architecture, landscape architecture, urban design, and urban and regional planning. Electives ordinarily can be taken from any program in the School and from another school in the University with the approval of the student’s advisor. The School maintains membership in:

- Association of Collegiate Schools of Architecture
- Association of Collegiate Schools of Planning
- Council of Landscape Architecture Educators
- Landscape Architecture Accreditation Board
- Planning Accreditation Board
- Tau Sigma Delta Honor Society
- Sigma Delta Lambda Honor Society

Academic Environment and Student Body

In addition to its regular curriculum programs, the School supports or sponsors a variety of events and activities that enlarge and broaden the learning environment in the School. Student internships for credit are available during the academic year. A summer international study program is offered. The School sponsors three receptions — at the beginning of the academic year, before Christmas, and at the end of the academic year — along with a Beaux Arts Ball in the spring, for students and the local professional community. Finally, the School sponsors several exhibitions of design and art works.

There are about 275 full-time students in the School. The student body is diverse, representing many academic disciplines and a wide variety of previous academic institutions. Students have previous degrees from a number of universities around the world.

Lecture Series

Guest critics are frequently invited to the School. In addition, the School has an official lecture series every year. The Lecture Series is composed of distinguished practitioners, critics, and scholars of national and international nature. Visiting critics and speakers include: Stanley Allen, Nader Ardalan, Ann Bergren, Livio Dimitriu, Peter Eisenman, Kenneth Frampton, Diane Ghirardo, Michael Hays, David R. Hill, George Hoover, Mark Johnson, Greg Lynn, Art McDonald, Ian McHarg, John Meunier, David Niland, John Novack, Patrick Quinn, George Ranalli, Frank E. Sanchis, Thomas Schumacher, Werner Seligman, Bahram Shirdel, H.A. Shirvani,

John R. Stilgoe, Harry Teague, William Turnbull, Anne Vernez-Moudon, Anthony Vidler, Peter Waldman, and Peter Walker.

SCHOOL FACILITIES

The School’s studios, library, Macintosh Architecture and Design Laboratory, Auto-Cadd Computer Laboratory, photo laboratory and darkroom, model shop, galleries, and offices are housed in three floors of the Dravo Building in 50,000 square feet of space. The laboratories and facilities were developed through an endowment by noted architect Temple Hoyne Buell, FAIA.

Architecture and Planning Library

Librarian: Robert Wick

The Architecture and Planning Library, a branch of the Auraria Library (administered by the University of Colorado at Denver), serves as a learning resource center in the fields of architecture and planning. It contains the following collections: reference, circulating, documentary (planning documents issued by local, regional, state and national agencies with an emphasis on planning materials pertaining to Colorado communities and concerns), periodicals, reserve, and non-print media including architectural slides and microcomputer software. The Architecture and Planning Library has over 13,000 volumes of books and monographs, 15,000 slides, and 105 periodical subscriptions.

The Architecture and Planning Library staff consists of a librarian, library assistant, and several student assistants. The Library provides a number of services including reference and research assistance and library-use instruction. Additional services, such as inter-library loan and computer-assisted research, are provided through the Auraria Library.

MACINTOSH ARCHITECTURE AND DESIGN LABORATORY

Director: Won Jin Tae

The Macintosh Architecture and Design Laboratory is dedicated to the promotion of design innovation and exploration with the Macintosh computer. The newly acquired laboratory contains 15 Macintosh II computers with megabyte internal hard drive and high resolution color monitors, a Macintosh II file server with 80 megabyte internal hard drive; an E-size, Hewlett-Packard Draftmaster I pen plotter; LaserWriter II printer; Image Writer II dot matrix printer; and ThunderScan image digitizer. The laboratory is presently experimenting with various drawing and painting software including MacArchitrition professional 3-dimensional modeling software, VersaCad, MacDraw II, SuperPaint, PixelPaint, Adobe Illustrator 88, VideoWorks, Canvas, MiniCad, and Mac3D. This state-of-the-art laboratory has been developed through a contribution by Apple Computer, Inc.

CADD COMPUTER LABORATORY

Director: Won Jin Tae

The CADD Laboratory of the School of Architecture and Planning is located adjacent to the Macintosh Architecture Laboratory and is equipped for upscaled computer-aided design and drafting with a microcomputer based networking system which is being modified and expanded. Six Zenith 2200 PC/ATs, in addition to four IBM PC/XTs with high resolution monitors and digitizing tablets, are now linked with a Novell central file server and 120 megabyte hard disk drive for storage. This network and six additional PC/XT workstations are linked through the addition of AutoCAD compatible software that extends and enhances the ongoing use of AutoCAD and AE/CADD. Additional capabilities are offered through AutoWord, an interactive word processing package for editing and displaying text of drawings; Auto CoGo, a coordinate geometry program that allows entry of survey and engineering data for site planning and engineering; LandSoft, a system for introducing landscape architectural symbols and drafting extension into the AutoCAD and AE/CADD utilities; and Generic Template, a means of customizing or creating unique design and drafting templates.

Also available are the ComputerVision system which includes the Personal Architect and Personal Designer packages, Gould Colorwriter 6320, and Hewlett-Packard plotters. Additional computing facilities are available at other sites on campus.

BUILDING TECHNOLOGY LABORATORY

Co-Directors: Soontorn Boonyatikarn and Phillip Gallegos

The Building Technology Laboratory functions as a teaching and research facility for both students and outside
practitioners. For the student, through hands-on experiment and physical demonstration, it is used to facilitate the learning process as well as bridge the gap between theoretical concepts and practical applications. For practitioners, this facility is used to enhance their practice and update their knowledge.

Some examples of equipment and facilities available include data acquisition systems, lighting research equipment, Macintosh visual input package, windflow simulation table, video equipment, and data logging equipment. Data acquisition systems include the following components: data logger Model 21X-L with 40K internal memory (RAM) and sealed rechargeable battery from Campbell Scientific; IBM PC-AT with 30 megabyte hard disk and 1.2 megabyte RAM; cassette tape recorder and cassette tape interface (for a remote application), analog and digital control cord; and necessary software for read/write access, data interfacing, and data manipulation.

Lighting Research Equipment includes: quantum/radiometer/photometer, two units of pyranometer model Ll-200SB-50, six units of photometric sensor - model Ll-210SB, and luminance meter at one degree spot.

The Macintosh package allows a direct input of visual image from any object into computer for further study. This equipment includes: Macintosh II computer, Macvision digitizer board and supported software, and visual camera model ICD-200 from IK EGAMI.

The windflow simulation table allows the designer to analyze various windflow patterns on two-dimensional forms. By allowing water to flow continuously in a given direction and by adding an even distribution of ink to identify the flow patterns, an immediate study can be encountered on a given site configuration.

Video equipment includes: video camera ROB, video monitor, and high quality four head VHS recorder.

Data logging equipment allows an automatic collection of data for a specific time and period. When furnished with the appropriate sensors, the following data can be obtained: temperature (surface temperature, air temperature, and subsurface temperature), moisture (wetbulb temperature and relative humidity), solar radiation, lighting intensity, and wind speed.

Photo Laboratory: Our new photography lab, with the latest state-of-the-art equipment, is used for architectural photography classes and by students to produce material for their portfolios. There are separate areas for developing, enlarging, drying, and copying.

Model-Making Laboratory: Students will have an 800-square-foot model shop in which to build projects for their classes. Table saws, jig saws, drill presses, jointers, and a full range of hand tools will allow the student to build models of wood, plastic, and steel. An adjacent paint spray room is equipped with a ventilated paint booth and vapor-proof lighting.

ADMISSIONS

General Requirements

The School of Architecture and Planning has an Academic Affairs Office that is headed by the Associate Dean. Primary responsibilities of the Academic Affairs Office include answering admission inquiries, processing admissions applications, awarding tuition scholarships, enforcing academic policies, and processing graduation applications.

Each applicant for admission into any of the programs of the School of Architecture and Planning must submit:
1. The University of Colorado Application for Graduate Admission forms.
2. Two official transcripts from each institution the applicant has attended.
3. Three letters of recommendation.
5. Examples of creative work (see below).
6. The application fee.

Special requirements for international applicants are described in a following section.

Examples of Creative Work: In architecture, landscape architecture, and urban design, applicants are expected to present samples of their creative and analytic work, commonly referred to as a portfolio. A portfolio is an orderly presentation of one's work. This includes examples of creative and analytic work including but not limited to essays, papers, photographs and photographic reproduction of artistic work such as sculpture, drawings, paintings, musical composition, and other fine arts. The format must be 8½" × 11", bound with not more than twelve pages (excluding papers). Slides are not accepted.

All portfolios must be identified by the student's full name and program to which the student is applying. A stamped, self-addressed envelope must be included for return of portfolio.

In general, a minimum of 3.00 grade-point average (GPA) on a 4.00 scale (or equivalent) in the prior undergraduate or graduate degree is required for admission.

Applicants with a GPA under 3.00 may be reviewed for admission; in such cases, submission of strong supporting materials is advised. For applicants with a GPA under 3.00, GRE scores are normally required for the Urban and Regional Planning Program and strongly recommended for applicants to the other programs.

The admissions decision is made weighing a variety of factors including academic preparation, quality of work experience and portfolio, appropriateness of the applicant's purpose, and overall likelihood of success in the program. Applicants may be admitted as non-degree students or with special conditions. Because of space limitations, not all qualified applicants may be accepted. Specific requirements for each program are listed below.

Master of Architecture
(first professional degree; three and one-half year program)

The three and one-half year (114 semester hours) program is appropriate for applicants with a bachelor's degree and no prior training or background in architecture or related field. Prerequisites are one year of college-level physics and college mathematics through a first course in calculus. For those without these prerequisites, courses are held in the summer term preceding the first semester.

Master of Architecture
(first professional degree; three and one-half year program with advanced standing)

Admission to the three and one-half year program with advanced standing is appropriate for applicants with a non-professional bachelor's degree in architecture or a bachelor's degree in a related field (engineering, design, art). Depending on their undergraduate record, qualified applicants with a non-professional architectural degree (the first part of a 4 + 2 program) would ordinarily be given advanced standing of up to one curriculum year in the program. Applicants with degrees in related fields may be exempted from courses in their specific areas of preparation but may be required to take all the courses in the architectural design sequence. The number of credits and exact point of entry into the program will be determined by the program director.
Master of Architecture
(post-professional degree)

The one-year (36 semester hours) post-professional degree program is appropriate for applicants holding a Bachelor of Architecture or equivalent first professional degree or diploma in architecture.

Master of Architecture in Urban Design
(one-year post-professional degree)

The one-year (36 semester hours) program is appropriate for applicants with a first professional design degree in architecture (e.g. B.Arch., M.Arch.).

Master of Landscape Architecture
(first professional degree)

The three-year (90 semester hours) first professional degree program is appropriate for those with a bachelor's degree and no training or background in landscape architecture or a related design field.

Master of Landscape Architecture
(post-professional degree)

The two-year (48 semester hours) post-professional degree program is appropriate for applicants with a first professional design degree (B.S.L.A., B.L.A., B.Arch., for example). Applicants without a prior Landscape Architecture degree may be required to take additional core requirements in Plant Materials and Ecology.

Master of Urban and Regional Planning

The two-year (51 semester hours) program is appropriate for applicants with bachelor's degrees in either design, humanities, social, or physical sciences.

International Applicants

Competence in oral and written English is expected in the School. The School of Architecture and Planning requires a minimum of 550 TOEFL score for international students from non-English speaking countries. However, the School will consider applications from students with strong academic credentials whose TOEFL scores are slightly below 550. If accepted, these students will be required to register for a one credit hour of architecture and planning writing workshop. This one credit hour cannot be used to fulfill part of the degree requirements.

Submission Requirements. International applicants must submit:
1. An International Student application and Graduate Admission forms.
2. Two official transcripts from each United States collegiate institution the applicant has attended.
3. Two certified copies of official academic records from each college institution the applicant has attended outside the United States. A certified literal English translation must accompany documents that are not in English.
4. Four letters of recommendation.
5. A statement of purpose.
6. A portfolio of academic, creative, and professional work.
7. A nonrefundable $50 application fee.
8. A current CU-Denver Financial Resources Statement. Statements used for other institutions will not be accepted. Photocopies of statements are not acceptable unless signed by the originator; signatures must not be photocopies.

Additional supporting documents may subsequently be required by the office of Admissions. All international applicants who are admitted to CU-Denver must have a valid visa and must enroll for and maintain a full course of study (12 or more semester hours) leading to the completion of a master's degree.

Financial Requirements. International applicants must provide evidence that they have sufficient funds available to attend the University of Colorado at Denver. To provide this evidence each international applicant should follow these instructions:
1. Complete the Financial Resources Statement. You must prove that you have sufficient money to pay your expenses by submitting the Financial Resources Statement as a part of your application.
2. If you are using your own money, your bank must certify that you have the full amount of money on deposit to meet tuition and expense costs. In Part 2, Section 1 of the Financial Resources Statement, your bank must certify that the money the applicant needs is on deposit in your account.
3. If you are being sponsored by a family member, a friend, your sponsor must agree to provide the money and sign the Financial Resources Statement in Part 2, Section 2. Your sponsor's bank must certify that the sponsor has on deposit the amount of money you will need.
4. If you have been awarded a scholarship, Part 2, Section 3 of the Financial Resources Statement must be completed.

Dates and Deadlines

All programs in the School admit students for all semesters. However, acceptance for the Spring and Summer Semesters will be on a space-available basis only. See the Academic Calendar in this catalog or the Schedule of Classes for specific dates.

To be considered for Fall Semester admission, all application materials must be received by the previous March 15. Applicants will be notified concerning their acceptance prior to May 1. To be considered for Spring Semester admission, all application materials must be received by the previous November 1. Applications received after March 15 or November 1 may be considered for non-degree status only.

Deadlines for submission of application materials:
- March 15 — for Fall Semester regular admission
- April 15 — for Summer Term regular admission
- November 1 — for Spring Semester regular admission

Applications after these dates will only be considered on a space-available basis.

Persons interested in any of the programs or in visiting the School are invited to call the Architecture and Urban Design Programs at (303) 556-2877, and the Landscape Architecture and Urban and Regional Planning Programs at (303) 556-3479 to arrange an appointment. For application forms or additional information, please write to:

Office of the Dean
School of Architecture and Planning
University of Colorado at Denver
1200 Larimer Street
Campus Box 126
Denver, Colorado 80204-5300
(303) 556-3382

Programs of Study

ARCHITECTURE

Program Director: Peter A. Schneider
Office: DR, Third Floor
Telephone: 556-2877
The architecture program offers curricula leading to both first and post professional Master of Architecture degrees. The first professional Master of Architecture (M.Arch.I) is fully accredited by the National Architectural Accrediting Board (NAAB) and is composed of five basic core areas: Architectural Design, History and Theory, Environmental Context, Science and Technology, and Professional Practice.

The program’s primary objective is to prepare students to enter the practice of architecture with a thorough foundation in the bodies of knowledge and applied methods. More specifically, the objectives of the program are to develop: an awareness of and sensitivity to the quality of the human environment; architectural context; deep understanding of architectural history, theory and criticism; thorough knowledge of architectural and building technology; competence in design process and expression with particular emphasis on exploration, experimentation, and synthesis; understanding of the institutional framework within which architecture takes place; and skills and understanding of professional practice including management and professional conduct.

The ultimate goal of the program is to provide the architecture student with a deep appreciation of architecture, while acquiring critical capacity, through comprehension of all facets of architecture. This is achieved through five groups of courses, organized in sequences within five coordinated modules.

Master of Architecture I
(First professional degree)

*Three and one-half year program.* The first professional Master of Architecture degree program is a 114 semester hour program requiring three and one-half years (six semesters and a summer term) of full-time study. The curriculum consists of a core of five related course components and 21 semester hours of electives that may be used for a concentration.

The program is taught at three levels, each with a theme. The first level involves the theme principles, definitions, communication, and design abstraction and takes the first two semesters. The next level takes three semesters and involves a dual theme — architecture in context and applications of methodologies. The theme of the final level in the third year is synthesis and professional competency.

### THE CURRICULUM - THREE AND ONE-HALF YEAR PROGRAM

#### DESIGN: 48 semester hours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH. 5500</td>
<td>Introduction to Architectural Design Studio I</td>
<td>6</td>
</tr>
<tr>
<td>ARCH. 5501</td>
<td>Introduction to Architectural Design Studio II</td>
<td>6</td>
</tr>
<tr>
<td>ARCH. 5502</td>
<td>Architectural Design Studio III</td>
<td>6</td>
</tr>
<tr>
<td>ARCH. 6600</td>
<td>Architectural Design Studio IV</td>
<td>6</td>
</tr>
<tr>
<td>ARCH. 6601</td>
<td>Architectural Design Studio V</td>
<td>6</td>
</tr>
<tr>
<td>ARCH. 6700</td>
<td>Advanced Architectural Design Studio VI</td>
<td>6</td>
</tr>
<tr>
<td>ARCH. 6701</td>
<td>Advanced Architectural Design Studio VII</td>
<td>6</td>
</tr>
</tbody>
</table>

#### HISTORY AND THEORY: 15 semester hours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH. 5520</td>
<td>Introduction to Design Theory and Criticism</td>
<td>3</td>
</tr>
<tr>
<td>ARCH. 5521</td>
<td>Survey of Architectural History</td>
<td>3</td>
</tr>
<tr>
<td>ARCH. 6620</td>
<td>Architecture in the 18th through 20th Centuries</td>
<td>3</td>
</tr>
<tr>
<td>ARCH. 6621</td>
<td>History of Architectural Theory</td>
<td>3</td>
</tr>
</tbody>
</table>

Theory Electives: 6 semester hours

#### ENVIRONMENTAL CONTEXT: 6 semester hours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA. 5530</td>
<td>Site Planning</td>
<td>3</td>
</tr>
<tr>
<td>UD. 6620</td>
<td>The Architecture of the City</td>
<td>3</td>
</tr>
</tbody>
</table>

#### SCIENCE AND TECHNOLOGY: 21 semester hours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH. 5530</td>
<td>Structures I</td>
<td>3</td>
</tr>
<tr>
<td>ARCH. 5531</td>
<td>Structures II</td>
<td>3</td>
</tr>
<tr>
<td>ARCH. 5532</td>
<td>Building Technology I</td>
<td>3</td>
</tr>
<tr>
<td>ARCH. 5533</td>
<td>Environmental Control Systems I</td>
<td>3</td>
</tr>
<tr>
<td>ARCH. 6630</td>
<td>Structures III</td>
<td>3</td>
</tr>
<tr>
<td>ARCH. 6631</td>
<td>Environmental Control Systems II</td>
<td>3</td>
</tr>
</tbody>
</table>

#### PROFESSIONAL PRACTICE: 3 semester hours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH. 6750</td>
<td>Professional Practice</td>
<td>3</td>
</tr>
</tbody>
</table>

#### ELECTIVES: 18 semester hours


Course Sequence: First Professional Degree

<table>
<thead>
<tr>
<th>Course Sequence</th>
<th>Design</th>
<th>History/Theory</th>
<th>Environmental Context</th>
<th>Science &amp; Technology</th>
<th>Professional Practice</th>
<th>Electives</th>
<th>Credit Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL</td>
<td>ARCH. 5500 (6)</td>
<td>ARCH. 5520 (3)</td>
<td>ARCH. 5530 (3)</td>
<td></td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SPRING</td>
<td>ARCH. 5501 (6)</td>
<td>ARCH. 5521 (3)</td>
<td>ARCH. 5531 (3)</td>
<td></td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SUMMER</td>
<td>ARCH. 5502 (6)</td>
<td>ARCH. 5532 (3)</td>
<td>ARCH. 5533 (3)</td>
<td></td>
<td></td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>FALL</td>
<td>ARCH. 6600 (6)</td>
<td>ARCH. 6620 (3)</td>
<td>LA. 5530 (3)</td>
<td>ARCH. 6630 (3)</td>
<td>ARCH. 6631 (3)</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>SPRING</td>
<td>ARCH. 6601 (6)</td>
<td>ARCH. 6621 (3)</td>
<td>ELECTIVES (3)</td>
<td>ELECTIVES (3)</td>
<td></td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>FALL</td>
<td>ARCH. 6700 (6)</td>
<td>ELECTIVES (3)</td>
<td>ARCH. 6750 (3)</td>
<td>ELECTIVES (12)</td>
<td></td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>SPRING</td>
<td>ARCH. 6701 (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.view all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Advanced Standing in the three and one-half year program. Students admitted with advanced standing to the first-professional degree program follow a course of study based on an evaluation of their academic credentials which takes place during the admissions process. Students who have degrees in related fields may be exempt from certain required courses. Students who have completed a pre-professional bachelor's degree in an accredited 4 + 2 program will be given advanced standing of up to one curriculum year in the program. The number of credits and exact point of entry into the program will be determined by the Program Director.

Master of Architecture II (Post-professional program)

Program Coordinator: S. Boonyatikarn

The post professional program in architecture is an advanced curriculum which focuses on research and specialization. The program offers four options of study: 1) Architectural Experimentation, 2) Architecture and Design with Macintosh, 3) Building Technology, and 4) Real Estate Development. The first option, Architectural Experimentation, is suited for students intending to further their knowledge in theory and criticism of architecture. Students are guided to investigate, explore, and experiment with ideas of non-conventional nature and to advance their design ability.

The second option, Architecture and Design with Macintosh, is designed to prepare the student for specialization in computer application in design generation and development.

The third option, Building Technology, prepares students for specialization in building performance studies utilizing the School's sophisticated Building Technology Laboratory. Solar, thermo, acoustics, and lighting studies are several main specializations offered by the faculty.

The fourth option, Real Estate Development, focuses on architecture and development process utilizing the expertise of Architecture and Urban and Regional Planning Program faculty.

Option I: Architectural Experimentation
Option II: Architecture and Design with the Macintosh
Option III: Building Technology
Option IV: Real Estate Development

Courses:

ARCH. 6622 (3) Modern Architecture
ARCH. 6623 (3) Investigations in Architecture
ARCH. 6627 (3) Post-Structuralist Architecture
ARCH. 6628 (3) Theories of Avant Garde
ARCH. 6632 (3) Building Performance Analysis
ARCH. 6633 (3) Lighting
ARCH. 6640 (3) Introduction to Computer Graphics
ARCH. 6641 (3) Computer Applications in Architecture
ARCH. 6642 (3) Design and Architecture with the Macintosh
ARCH. 6643 (3) Advanced Design Applications with the Macintosh
ARCH. 6704 (6) Architectural Experimentation I
ARCH. 6705 (6) Architectural Experimentation II
ARCH. 6950 (6) Thesis Research and Programming
ARCH. 6951 (6) Architecture Thesis

URP. 6660 (3) Real Estate Development Process
URP. 6661 (3) Real Estate Development Finance
URP. 6662 (3) Real Estate Market Analysis
URP. 6664 (3) Fiscal Impact Analysis
## COURSE SEQUENCE: OPTION I, ARCHITECTURAL EXPERIMENTATION

<table>
<thead>
<tr>
<th>Course Sequence</th>
<th>Design Studio</th>
<th>Theory</th>
<th>Electives</th>
<th>Credit Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL Year 1</td>
<td>ARCH. 6704 (6)</td>
<td>ARCH. 6622 (3) ARCH. 6627 (3)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SPRING Year 1</td>
<td>ARCH. 6705 (6)</td>
<td>ARCH. 6623 (3) ARCH. 6628 (3)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SUMMER</td>
<td></td>
<td>ELECTIVES (12)</td>
<td>12</td>
<td>36</td>
</tr>
</tbody>
</table>

## COURSE SEQUENCE: OPTION II, ARCHITECTURE AND DESIGN WITH THE MACINTOSH

<table>
<thead>
<tr>
<th>Course Sequence</th>
<th>Research Project or Thesis</th>
<th>Theory</th>
<th>Electives</th>
<th>Credit Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL Year 1</td>
<td>ARCH. 6704 (6) OR ARCH. 6950 (6)</td>
<td>ARCH. 6640 (3) ARCH. 6642 (3)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SPRING Year 1</td>
<td>ARCH. 6705 (6) OR ARCH. 6951 (6)</td>
<td>ARCH. 6641 (3) ARCH. 6643 (3)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SUMMER</td>
<td></td>
<td>ELECTIVES (12)</td>
<td>12</td>
<td>36</td>
</tr>
</tbody>
</table>

## COURSE SEQUENCE: OPTION III, BUILDING TECHNOLOGY

<table>
<thead>
<tr>
<th>Course Sequence</th>
<th>Research Project or Thesis</th>
<th>Theory</th>
<th>Electives</th>
<th>Credit Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL Year 1</td>
<td>ARCH. 6704 (6) OR ARCH. 6950 (6)</td>
<td>ARCH. 6632 (3) ARCH. 6642 (3)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SPRING Year 1</td>
<td>ARCH. 6705 (6) OR ARCH. 6951 (6)</td>
<td>ARCH. 6633 (3) ARCH. 6643 (3)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SUMMER</td>
<td></td>
<td>ELECTIVES (12)</td>
<td>12</td>
<td>36</td>
</tr>
</tbody>
</table>

## COURSE SEQUENCE: OPTION IV, REAL ESTATE DEVELOPMENT

<table>
<thead>
<tr>
<th>Course Sequence</th>
<th>Research Project or Thesis</th>
<th>Theory</th>
<th>Electives</th>
<th>Credit Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALL Year 1</td>
<td>ARCH. 6704 (6) OR ARCH. 6950 (6)</td>
<td>URP. 6660 (3) URP. 6662 (3)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SPRING Year 1</td>
<td>ARCH. 6705 (6) OR ARCH. 6951 (6)</td>
<td>URP. 6661 (3) URP. 6664 (3)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>SUMMER</td>
<td></td>
<td>ELECTIVES (12)</td>
<td>12</td>
<td>36</td>
</tr>
</tbody>
</table>

### ARCHITECTURE ELECTIVES:
- ARCH. 5540 (3) Design Photography
- ARCH. 6610 (3) Furniture Design
- ARCH. 6622 (3) Modern Architecture
- ARCH. 6623 (3) Investigations in Architecture
- ARCH. 6624 (3) The Built Environment in Other Cultures I: Research Design
- ARCH. 6910 (6) The Built Environment in Other Cultures II: Field Experience
- ARCH. 6627 (3) Post-Structuralist Architecture
- ARCH. 6628 (3) Theories of Avant Garde
- ARCH. 6632 (3) Building Performance Analysis
- ARCH. 6633 (3) Lighting
- ARCH. 6634 (3) Materials and Detailing I: Residential
- ARCH. 6635 (3) Materials and Detailing II: Commercial
- ARCH. 6640 (3) Introduction to Computer Graphics
- ARCH. 6641 (3) Computer Applications in Architecture
- ARCH. 6642 (3) Design and Architecture with the Macintosh
- ARCH. 6643 (3) Advanced Design Applications with the Macintosh
- ARCH. 6683 (3) Teaching Methods in Architecture
- ARCH. 6704 (6) Architectural Experimentation I
- ARCH. 6705 (6) Architectural Experimentation II
- ARCH. 6720 (3) American Art and Architecture
- ARCH. 6721 (3) Art and Architecture of Islam
- ARCH. 6722 (3) Latin American Art and Architecture
- ARCH. 6723 (3) Oriental Art and Architecture
- ARCH. 6740 (3) Computer Aided Design
- ARCH. 6930 (3) Architecture Internship
- ARCH. 6931 (3) Architecture Internship
- ARCH. 6950 (6) Thesis Research and Programming
- ARCH. 6951 (6) Architecture Thesis
ARCHITECTURE COURSES

ARCH. 5050-3. Applied Mathematics for Designers I. This class is designed for the student with little or no college math experience. It begins with arithmetic skills and shortcuts, continues through college level algebra, and ends with trigonometry. This class is a part of the required mathematics for students of architecture, but is recommended for anyone of non-technical background.

ARCH. 5051-3. Applied Mathematics for Designers II. A continuation of ARCH. 5050, this class will begin with analytical geometry and continue through differential and integral calculus. The course completes the mathematics requirement for students of architecture and is open to those who have credit for or feel competent in the material covered in ARCH. 5050.

ARCH. 5052-3. Environmental Science for Designers. This course is designed to meet the requirements of the School of Architecture and Planning for entrance into the graduate program in architecture. The basic principles of physics will be covered in a practical way. The course includes the mechanics of bodies at rest, dynamics, electricity, heat, light, and sound. The course is recommended for anyone who needs a working knowledge of general science.

ARCH. 5500-6. Introduction to Architectural Design Studio I. The introductory studio focuses on the basic strategies and techniques of design production. Students are introduced to architects, design analysis and criticism, and the significance of the elements of design. Emphasis is placed on development of an awareness of the role of architectural theory and history in the design process. Prer., ARCH. 5050, ARCH. 5051, and ARCH. 5052; coreq., ARCH. 5510, ARCH. 5520, and ARCH. 5530.

ARCH. 5501-6. Introduction to Architectural Design Studio II. The second introductory design studio continues the examination of the issues raised in the first semester and begins investigation of more complex issues related to building design and landscape. Emphasis is placed on developing a systematic approach to design while simultaneously dealing with the development of theory and intellectual inquiry. Prer., ARCH. 5500; coreq., ARCH. 5511, ARCH. 5521, and ARCH. 5531.

ARCH. 5502-6. Architectural Design Studio III. The first intermediate studio in architecture focuses on the interrelationship between architectural design and the art of construction. The course acts as a transition between the abstract and theoretical concerns of the introductory studios and the thoughtful realization or practice of ideas. The emphasis is placed on development of how a building is put together as a material conceptual construct. Prer., ARCH. 5501; coreq., ARCH. 5532 and ARCH. 5533.

ARCH. 5510-3. Elements of Design Expression and Presentation I. This course covers the basic principles of descriptive geometry (technical drawing). Basic principles of orthographic projection, axonometric projection, perspective, and photographic representation methods (portfolio) are examined. Emphasis is placed on defining abstract forms and real objects in terms of line, light, shade, and shadow.

ARCH. 5511-3. Elements of Design Expression and Presentation II. This course builds upon the basic principles and issues in the previous semester. Craft and precision are stressed, but with an emphasis toward design articulation and individual expression. Students are introduced to a wide range of compositional techniques and methods and selection of media and materials. The subjects covered are: drawing as analysis, drawing as representation, principles of color interaction, and means of representing architectural space in terms of color, light, shade, and shadow graduation and value distinction.

ARCH. 5520-3. Introduction to Design Theory and Criticism. This course examines the evolution of ideals and principles in modern architecture, design, landscape, and urbanism and traces the historical development of theoretical issues through a study of selected writing. The course provides an overview of the literature in design theories and explores the relationship between design and the writings that include its interpretation and production.

ARCH. 5521-3. Survey of Architectural History. The second course in the history/theory sequence, beginning with architecture and urbanism in antiquity, stresses the origin and interpretation of built form as symbol and the problems of early building technology and development of tradition in European architecture and urbanism. It examines the emergence of building types and settlement patterns and their relationship to social institutions. Case studies are drawn from pre-classical, classical, and late antiquity, Gothic, Renaissance, and Baroque architecture.

ARCH. 5530-3. Structures I. The course introduces the analysis and design of structural elements and focuses on fundamental principles of statics and strength of materials. Areas covered are equilibrium, movement, trusses, three-force members, properties of structural materials including wood and steel, stress-strain relationships, and an introduction into the design and analysis of structural elements made of wood and steel in tension, shear, and bearing.

ARCH. 5531-3. Structures II. The course is a continuation of Structures I, focusing on study of stress determination of structures and general principles involved in the design of wood, steel, and concrete members. Problems in design of building elements subjected to direct stress, beveling, and combined stress, deflection, methods of fabrication, and details of connections are explored. Prer., ARCH. 5530.

ARCH. 5532-3. Building Technology I. This course addresses issues in building construction and focuses on interrelationships between conceptual and technical aspects of building construction techniques through lectures, case study presentations, and exercises. It focuses on the wide range of materials and construction techniques available to meet design objectives.

ARCH. 5533-3. Environmental Control Systems I. This course focuses on study of environmental control systems in building, including the thermal behavior of buildings, climate as a major determinant of building design, energy use in buildings, strategies for designing buildings as complete environmental control systems, mechanical means of environmental controls, heating, ventilation, cooling, plumbing, electrical, and communication systems, water supply, and sanitation systems.

ARCH. 5540-3. Design Photography. This course will introduce architectural students to the basics of photography and architectural photography. Class will be a combination of lecture/demonstration and student assignments followed by evaluation. The course will enable students to produce their own working photographs of drawings, models, and buildings.

ARCH. 6600-6. Architectural Design Studio IV. The second intermediate studio sequence focuses on exploration of architectural design in the urban context and examination of typological form and cultural constructs which will provide a basis for the inclusion of new spaces and forms within the fabric of the city. Emphasis is placed on methodological study of site, program, and elements of architecture which are used to facilitate work. Prer., ARCH. 5502; coreq., ARCH. 6620, ARCH. 6630, ARCH. 6631, and LA. 5530.

ARCH. 6601-6. Architectural Design Studio V. The final intermediate studio sequence focuses on examination of impacts of large-scale urban projects that include commercial, office, and residential uses in an existing urban fabric. Issues such as typology, character, and monumentality are considered in relation to the design of buildings of civic significance. Emphasis is placed on relationship of the role of the building to the morphology of the city and the building's expression in architectural form. Prer., ARCH. 6600; coreq., ARCH. 6621.

ARCH. 6610-3. Furniture Design. The focus of this studio/lecture course is to explore the effects and responses of physical human factors, material characteristics, structure, joinery, and history in the design of furniture. Design process, programming, design and presentation techniques along with drawing and model building skills are emphasized in this project-oriented course.

ARCH. 6620-3. Architecture in the 18th through 20th Centuries. The third course
ARCH. 6621-3. History of Architectural Theory. This course investigates architectural thought from antiquity to the present. It begins with a review of Greek ideals and then proceeds — through an appreciation of architecture and its texts as an essential cultural constituent — with a survey of major themes such as Renaissance Humanism, Enlightenment Rationalism, Romantic Historicism, Neo-Medievalism, the varieties of Modernism, Neo-EClecticism, and the most recent directions.

ARCH. 6622-3. Modern Architecture. This course examines modern architecture from DeStijl and the Bauhaus to LeCorbusier. Emphasis is placed on critical evaluation of this developmental stage and its impact on discipline of architecture and city design.

ARCH. 6623-3. Investigations in Architecture. This course focuses on examination of the historical development of theoretical issues through a study of selected writings and the evolution of ideas and design principles in architecture, landscape architecture, and urbanism. It explores the pedagogic relationship between design and the cultural roots that influence its interpretation and production.

ARCH. 6624-3. The Built Environment in Other Cultures I: Research Design. This course intends to broaden students' perspectives by asking them to examine design within another culture. Each student will prepare a proposal of study including a statement of the problem to be addressed, the type of field research to be undertaken, and the nature of the report produced.

ARCH. 6627-3. Post-Structuralist Architecture. This course examines theories of post-structuralism and their implications to architectural exploration and experimentation. Drawing from Derrida, Descartes, Derrida, Heidegger, Barthes, Foucault, and other leading authorities, the course focuses on development of a theoretical discourse for architecture.

ARCH. 6628-3. Theories of Avant Garde. This course examines the origin and evolution of the Avant Garde theories from Russian Constructivism to Futurism, Dadaism, Surrealism, and DeStijl. Emphasis is placed on investigation of the implication of historic Avant Garde to present modes of architectural exploration.

ARCH. 6630-3. Structures III. This course examines theoretical and conceptual bases for the qualitative and quantitative analysis of indeterminate structures. Course topics include continuity, movement distribution, reinforced concrete elements, prestressed concrete elements, walls, columns, footings, earthquake loads on buildings, and detailing of structural systems. Prer., ARCH. 5530 and ARCH. 5331.

ARCH. 6631-3. Environmental Control Systems II. The course focuses on lighting and its relationship to architecture and urbanism. Classroom work will be done jointly with the lighting section of the course. Prer., ARCH. 6633-3. Lighting. The course will be taught using the Macintosh computer as a tool for exploring design methods and generating new ideas and forms. The Macintosh is seen as an extension or amplification of the human brain. The course does not require the user to learn computer programming or complicated command structures; a non-technical, intuitive, word of mouth, trial and error mode of learning is possible. Once basic skills are mastered, production is immediate. Emphasis is placed on analysis, self-criticism, revision, and refinement of design intentions with the computer tool.

ARCH. 6643-3. Advanced Design Applications with the Macintosh. This course builds upon experiences gained from the introductory course. ARCH. 6642. The course requires the students to have an extensive knowledge of the Macintosh system. The course will devote the entire semester to work with the three-dimensional modeling programs. Emphasis is placed on an understanding of design and spatial representation in three-dimensional spatial representation of design and architectural constructions. Prer., ARCH. 6642.

ARCH. 6683-3. Special Topics in Architecture. Various topical concerns are offered in architecture history, theory, elements, concepts, methods and implementation strategies, and other related areas.

ARCH. 6700-6. Advanced Architectural Design Studio VI. The studio focuses on students' elaboration and substantiation of personal ideas through complex design exercises and by critically addressing the status of contemporary architectural theory. Emphasis is placed on a comprehensive design project that is structured to test students on integration of structural aspects, mechanical systems, site planning, and climate considerations within their design solutions. Prer., ARCH. 6601; correq., ARCH. 6750 and UB 6620.

ARCH. 6701-6. Advanced Architectural Design Studio VII. The final design studio continues the comprehensive approach through a full range of design investigation and strategies at all scales from program and conception to construction detail. Students must demonstrate abilities to synthesize all
previous work through an application of a complex architectural design project. Prer., ARCH. 6700.

ARCH. 6704-6. Architectural Experimentation I. An advanced architectural design studio focusing on design explorations and stressing theorization and development of ideologies in architectural design. Emphasis is placed on experimentation with various art media such as painting, sculpture, music, linguistics, film making, and others.

ARCH. 6705-6. Architectural Experimentation II. As a continuation of ARCH. 6704, this studio stresses a cumulative effort toward synthesis and contribution of original proposal for development of architectural theory. Emphasis is placed on architectural transformation as a major indicator of the original contribution of this studio.

ARCH. 6720-3. American Art and Architecture. This course focuses on major developments in American art from 1750–1950. Painting and sculpture, as well as important developments in architecture, will be discussed. The work of such artists and architects as Copley, Peale, Whistler, Cassatt, Hopper, O’Keeffe, Thomas Jefferson, Louis Sullivan, and Frank Lloyd Wright will be studied.

ARCH. 6721-3. Art and Architecture of Islam. This course focuses on study and examination of the art and architecture of the Islamic cultures from the death of Muhammad through the 18th century from Spain to India.

ARCH. 6722-3. Latin American Art and Architecture. This course focuses on study and examination of the art and architecture of the colonies of Spain and Portugal in the western hemisphere from 1492 to the present.

ARCH. 6723-3. Oriental Art and Architecture. This is an introductory survey of oriental art and architecture. The course aims to uncover the relationship between East Asian art and architecture and its accompanying theories.

ARCH. 6740-3. Computer Aided Design. The course explores the relationship between design, mathematics, and computation. The concepts of finite mathematics will be introduced using building design examples. Problem-solving methods in design and computation will be explored. The analysis of plan types will be related to topology and geometry; symmetry and combinatorial groups will be introduced. Computer projects and readings will be assigned to explore the concepts.

ARCH. 6750-3. Professional Practice. This course introduces the student to the essential elements of professional practice through subject areas such as internship, licensing, services, modes of practice, fees, marketing, documents, specifications, and production procedures. One three-hour lecture per week. Prer., final year in program or approval of instructor.

ARCH. 6840-1 to 3. Independent Study. Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to architecture.

ARCH. 6910-6. The Built Environment in Other Cultures II: Field Experience. Students will travel to their respective cities and undertake the agreed upon study proposals. The course intends not only to help students consider their own design and planning attitudes, but also to help them see the world from a more balanced perspective.

ARCH. 6930-3, ARCH. 6931-3. Architecture Internship. This course is designed to provide professional practice experience to students and is composed of eight hours per week work in a practicing professional’s office during the regular semester. The student is placed in an architectural and/or design office by the School and receives credit instead of pay. Students must complete second year level before taking this course.


URBAN DESIGN

Program Coordinator: Paul Saporito

A city no longer inhabited, not simply left behind, but haunted by meaning and culture. This state of being haunted, which keeps the city from returning to nature, is perhaps the general mode of the presence or absence of the thing itself is pure language. (Derrida 1978)

Cities are in reality great campuses of the living and the dead where many elements remain like signals, symbols, cautious. When the holiday is over, what remains of the architecture is scarred, and the sand consumes the street again. There is nothing left but to resume with a certain obstinacy the reconstruction of elements and instruments in expectation of another holiday. (Aldo Rossi 1981)

The Urban Design Program at the School of Architecture and Planning is intended to be a non-conventional research program leading to the degree of Master of Architecture in Urban Design. The premise of the program is investigation, exploration, experimentation, and representation of ideas and proposals regarding the development of the city. Unlike the classical mode of inquiry, the Urban Design Program takes a relatively more radical approach to the analysis of architecture of the city. The curriculum is designed for the questioning of the existing connections and searching for alternative ideolo-

gies and proposals for the city’s architecture through a structured sequence of lecture and design studios.

There are two options of study which extend over a two semester or three semester course of study. There are three curriculum steps involved in these plans. The first step of the curriculum engages students in studying the fundamentals of theory and criticism concerning the structure of present architectural text and courses. Simultaneously, the student also is introduced to the process of decomposition. This step is necessary for the understanding of the interrelationship between architectural text as a language and architectural text as an artifact. The second step of the curriculum engages the student in studying the recomposition of the city, a process that is in reverse order of the first step. Recomposition involves a sequence of activities that begins with the questioning of the traditions, followed by an investigation of the metaphysics of origins and presence, and ends with the formulation of new design strategies for the architecture of the city. The third and final step is intended to be a cumulative experience where the student pursues individual interest in urban design.

Master of Architecture in Urban Design

The Master of Architecture in Urban Design Program is a one-year post-professional degree and is suited for students who have completed a first-professional degree in Architecture (B.Arch., M.Arch.). The program requires completion of a minimum of 36 credit hours.

CORE CURRICULUM

The core curriculum consists of six graduate courses for a total of 21 credit hours. Some students entering the program may be advised to take additional courses depending on their educational backgrounds. The core curriculum consists of the following courses:

UD. 6600 (6) Transformation and Decomposition Studio
UD. 6601 (6) Composition Studio
UD. 6602 (6) City of Exploration and Experimentation Studio (Optional)
UD. 6620 (3) The Architecture of the City
UD. 6621 (3) The City as an Artifact
ARCH. 6622 (3) Modern Architecture
ARCH. 6623 (3) Investigations in Architecture
OPTION I: ONE ACADEMIC YEAR

<table>
<thead>
<tr>
<th>COURSE SEQUENCE</th>
<th>DESIGN STUDIO</th>
<th>THEORY</th>
<th>ELECTIVES</th>
<th>CREDIT HRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>YEAR 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FALL</td>
<td>UD. 6600 (6)</td>
<td>UD. 6620 (3)</td>
<td>ELECTIVES (6)</td>
<td>18</td>
</tr>
<tr>
<td>SPRING</td>
<td>UD. 6601 (6)</td>
<td>UD. 6621 (3)</td>
<td>ELECTIVES (6)</td>
<td>18</td>
</tr>
<tr>
<td>SUMMER</td>
<td>UD. 6602 (6)</td>
<td></td>
<td>12</td>
<td>36</td>
</tr>
</tbody>
</table>

ELECTIVES:
LA. 6621 (3) History of Landscape Architecture Theory
URP. 5532 (3) Historical Development of Urban Form
URP. 6680 (3) Urbanization in Developing Countries
URP. 6682 (3) Housing in Developing Countries
ARCH. 6621 (3) History of Architectural Theory
ARCH. 6627 (3) Post-Structuralist Architecture
ARCH. 6628 (3) Theories of Avant Garde
ARCH. 6640 (3) Introduction to Computer Graphics
ARCH. 6641 (3) Computer Applications in Architecture
ARCH. 6642 (3) Design and Architecture with the Macintosh
ARCH. 6643 (3) Advanced Design Applications with the Macintosh
ARCH. 6683 (3) Teaching Methods in Architecture
ARCH. 6720 (3) American Art and Architecture
ARCH. 6721 (3) Art and Architecture of Islam
ARCH. 6722 (3) Latin American Art and Architecture
ARCH. 6723 (3) Oriental Art and Architecture
ARCH. 6740 (3) Computer Aided Design

URBAN DESIGN COURSES
UD. 6600-6. Transformation and Decomposition Studio. The first studio of a two-studio sequence introduces the process of decomposition in urban structure through analysis of landscape and structures in search of originary and non-originary elements of the city. The studio then is an attempt to restore imminent conditions — the suspension between origin and effect, between positive and negative elements of urban structure.

UD. 6601-6. Composition Studio. This studio builds upon the analytical investigations conducted in the previous semester and explores the process of composition or recomposition in the architecture of the city. Drawing upon deconstructionist theory, the studio presents a challenge to the hegemony of traditional design studios and is a search for authenticity. Considering architecture as text, the studio is a means to represent an invention, an invited speculation on the conditions of architecture of the city.

UD. 6602-6. City of Exploration and Experimentation Studio. This is an optional independent studio where individual students pursue their individual interests with emphasis on interaction between architecture and other disciplines. This studio is structured as a cumulative synthesis of knowledge and skills into an original proposal for the betterment of city conditions.

UD. 6603-3. The Architecture of the City. This course focuses on interpretation of architecture of the city and its landscape, articulation and disarticulation, discontinuity of order, immannence, and memory. Drawing from contemporary writers such as Derrida, Bataille, Adorno, Habermas, Heidegger, and others, the course examines the questions of replication, representation, and signification in the city.

UD. 6601-3. City as an Artifact. This course focuses on study of originary and non-originary architecture and its implications to urban context. Beginning by examination of classical representation and refutation, the course attempts to present denial and possibility in architecture by investigating the tradition and metaphysics of origins and presence.

UD. 6686-3. Special Topics in Urban Design. Various topical concerns are offered in urban design history, theory, elements, concepts, methods, and implementation strategies and other related areas.

UD. 6640-1 to 3. Independent Study. Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to urban design.

LANDSCAPE ARCHITECTURE

Program Director: Lois A. Brink

The Landscape Architecture Program offers both first and post-professional Master of Landscape Architecture degrees. The first professional Master of Landscape Architecture (M.L.A.) is fully accredited by the Landscape Architectural Accreditation Board (LAAB) and is recognized by the Council of Landscape Architecture Educators.

The program's primary objective is to prepare students to enter the practice of landscape architecture with a thorough foundation in the bodies of knowledge and applied methods. More specifically, the objectives of the program are to develop: an awareness of and sensitivity to the quality of landscape and built environment; spatial context; understanding of history, theory, and criticism of architecture and landscape; thorough knowledge of landscape technology; competence in design process and expression with particular emphasis on exploration, experimentation, and synthesis; and understanding of professional practice including management and professional conduct.

The ultimate goal of the program is to provide the student with a deep appreciation of landscape as context within which objects are placed, the integration of landscape and objects, critical capacity, and comprehension of the art of landscape design.

Master of Landscape Architecture I
(First professional degree)

Three year program. The first professional M.L.A. degree requires 90 semester hours and three years of full-time study. The curriculum consists of a core of four related course components: Design, 42 credit hours; History and Theory, 12; Science and Technology, 12; and Professional Practice, 3, totaling 69 credit hours, and 21 semester hours of electives.
THE CURRICULUM — THREE YEAR PROGRAM

DESIGN: 42 semester hours
LA. 5500 (6) Introduction to Landscape Architectural Design Studio I
LA. 5501 (6) Introduction to Landscape Architectural Design Studio II
LA. 6600 (6) Landscape Architectural Design Studio III
LA. 6601 (6) Landscape Architectural Design Studio IV
LA. 6700 (6) Advanced Landscape Architectural Design Studio V
LA. 6701 (6) Advanced Landscape Architectural Design Studio VI
LA. 5510 (3) Elements of Design Expression and Presentation I
LA. 5511 (3) Elements of Design Expression and Presentation II

HISTORY AND THEORY:
12 semester hours
ARCH. 5520 (3) Introduction to Design Theory and Criticism
ARCH. 5521 (3) Survey of Architectural History
ARCH. 6620 (3) Architecture in the 18th through 20th Centuries
LA. 6621 (3) History of Landscape Architecture Theory

SCIENCE AND TECHNOLOGY:
12 semester hours
LA. 5530 (3) Site Planning
LA. 5570 (3) Plants in Design
LA. 6630 (3) Landscape Technology I
LA. 6631 (3) Landscape Technology II

PROFESSIONAL PRACTICE:
3 semester hours
ARCH. 6750 (3) Professional Practice

ELECTIVES: 21 semester hours

COURSE SEQUENCE: TWO YEAR PROGRAM

Master of Landscape in Architecture II (Post-professional degree)

Two year program. The post-professional degree program requires 48 semester hours and two years of full-time study.

The core curriculum consists of two groups: Design, 30 credit hours; and History/Theory, 12; for a total of 42 credit hours, and 6 semester hours of electives.

THE CURRICULUM — TWO YEAR PROGRAM

DESIGN: 30 semester hours
LA. 5500 (6) Introduction to Landscape Architectural Design Studio I
LA. 5501 (6) Introduction to Landscape Architectural Design Studio II
LA. 6700 (6) Advanced Landscape Architectural Design Studio V
LA. 6701 (6) Advanced Landscape Architectural Design Studio VI
LA. 5510 (3) Elements of Design Expression and Presentation I
LA. 5511 (3) Elements of Design Expression and Presentation II

HISTORY AND THEORY:
12 semester hours
ARCH. 5520 (3) Introduction to Design Theory and Criticism
ARCH. 5521 (3) Survey of Architectural History
ARCH. 6620 (3) Architecture in the 18th through 20th Centuries
LA. 6621 (3) History of Landscape Architecture Theory

COURSE SEQUENCE:

<table>
<thead>
<tr>
<th>COURSE SEQUENCE</th>
<th>DESIGN</th>
<th>HISTORY/ THEORY</th>
<th>SCIENCE &amp; TECHNOLOGY</th>
<th>PROFESSIONAL PRACTICE</th>
<th>ELECTIVES</th>
<th>CREDIT HRS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>YEAR I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FALL</td>
<td>LA. 5500 (6)</td>
<td>ARCH. 5520 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPRING</td>
<td>LA. 5510 (3)</td>
<td>ARCH. 5521 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YEAR II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FALL</td>
<td>LA. 6600 (6)</td>
<td>ARCH. 6620 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPRING</td>
<td>LA. 6610 (6)</td>
<td>LA. 6630 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YEAR III</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FALL</td>
<td>LA. 6700 (6)</td>
<td>ARCH. 6750 (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPRING</td>
<td>LA. 6701 (6)</td>
<td>ELECTIVES (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>42</td>
<td>12</td>
<td>12</td>
<td>3</td>
<td>21</td>
<td>90</td>
</tr>
</tbody>
</table>
ELECTIVES:
LA. 6622 (3) Visual Quality Analysis
LA. 6624 (3) The Built Environment in Other Cultures I: Research Design
LA. 6910 (6) The Built Environment in Other Cultures II: Field Experience
LA. 6641 (3) Computer Applications in Landscape Architecture
LA. 6686 (3) Special Topics in Landscape Architecture
LA. 6840 (1-3) Independent Study
LA. 6930 (3) Landscape Architecture Internship
ARCH. 5540 (3) Design Photography
ARCH. 6622 (3) Modern Architecture
ARCH. 6623 (3) Investigations in Architecture
ARCH. 6627 (3) Post-Structuralist Architecture
ARCH. 6628 (3) Theories of Avant Garde Architecture
ARCH. 6640 (3) Introduction to Computer Graphics
ARCH. 6641 (3) Computer Applications in Architecture
ARCH. 6642 (3) Design and Architecture with the Macintosh
ARCH. 6643 (3) Advanced Design Applications with the Macintosh
ARCH. 6683 (3) Teaching Methods in Architecture
ARCH. 6704 (6) Architectural Experimentation I
ARCH. 6705 (6) Architectural Experimentation II
ARCH. 6720 (3) American Art and Architecture
ARCH. 6721 (3) Art and Architecture of Islam
ARCH. 6722 (3) Latin American Art and Architecture
ARCH. 6723 (3) Oriental Art and Architecture
ARCH. 6740 (3) Computer Aided Design
URP. 5529 (3) Urban Spatial Analysis
URP. 5532 (3) Historical Development of Urban Form
URP. 6649 (3) Environmental Planning I: Ecology
URP. 6650 (3) Environmental Planning II: Policy and Law
URP. 6660 (3) Real Estate Development Process
URP. 6661 (3) Real Estate Development Finance
URP. 6662 (3) Real Estate Market Analysis
URP. 6664 (3) Fiscal Impact Analysis

A thesis option [LA. 6950 (6): Thesis Research and Programming and LA. 6951 (6): Landscape Architecture Thesis] is available primarily for students who are interested in pursuing more advanced academic training in landscape architecture or related fields.

LANDSCAPE ARCHITECTURE COURSES

LA. 5500-6. Introduction to Landscape Architectural Design Studio I. The introductory studio focuses on the basic strategies and techniques of design production. Students are introduced to architectural, design analysis and criticism, and the significance of the elements of design. Emphasis is placed on development of an awareness of the role of theory and history in the design process.

LA. 5501-6. Introduction to Landscape Architectural Design Studio II. The second introductory design studio continues the examination of the issues raised in the first semester and begins investigation of more complex issues related to building design and landscape. Emphasis is placed on developing a systematic approach to design while simultaneously dealing with the development of theory and intellectual inquiry.

LA. 5510-3. Elements of Design Expression and Presentation I. This course covers the basic principles of descriptive geometry (technical drawing). Basic principles of orthographic projection, axonometric projection, perspective, and photographic reproduction methods (portfolio) are examined. Emphasis is placed on defining abstract forms and real objects in terms of line, light, shade, and shadow.

LA. 5511-3. Elements of Design Expression and Presentation II. This course builds upon the basic principles and issues in the previous semester. Craft and precision are stressed, but with an emphasis toward design articulation and individual expression. Students are introduced to a wide range of computational techniques and methods and selection of media and materials. The subjects covered are: drawing as analysis; drawing as representation; principles of color interaction; and means of representing architectural space in terms of color, light, shade, and shadow gradation and value distinction.

LA. 5530-3. Site Planning. The course focuses on the site planning process, including research and data gathering; data analysis and synthesis; design analysis and its relationship to building program and concept; and design synthesis of site and preparation of site plan. Emphasis is placed on design through grading, representation, manipulation and calculation of road work, utilities, and other site features.

LA. 5570-3. Plants in Design. This course focuses on the study of design methods used in landscape architecture. Formal design principles, spatial sequencing, and plant functions are applied in design studies, based on botanical aesthetic traits and physical requirements of a wide variety of plant material.

LA. 6600-6. Landscape Architectural Design Studio III. The first intermediate studio focuses on the exploration of landscape as context and its integration of objects. Emphasis is placed on exploration of landscape and experimentation with spatial organization and manipulation of context.

LA. 6601-6. Landscape Architectural Design Studio IV. The second intermediate studio sequence focuses on larger scale development projects dealing with more complex spatial arrangement of buildings and other objects within the landscape, functional needs and requirements within the framework of a variety of social, economic, and natural/physical constraints.

LA. 6621-3. History of Landscape Architecture Theory. This course investigates architectural thought from antiquity to the present. It begins with a review of Greek ideals and then proceeds—through an appreciation of landscape and nature as essential cultural constituents—with a survey of major themes such as Renaissance Humanism, Enlightenment Rationalism, Romantic Historicism, Neo-Medievalism, the varieties of Modernism, Neo-Eclecticism, and the most recent directions in landscape and garden design.

LA. 6622-3. Visual Quality Analysis. This course introduces students to a range of philosophies, methods, and techniques in visual landscape analysis. Emphasis is placed on application of methods and techniques to urban and regional context and scale, and visual impact assessment and simulation.

LA. 6624-3. The Built Environment in Other Cultures I: Research Design. This course intends to broaden the students' perspectives by asking them to examine design within another culture. Each student will prepare a proposal of study including a statement of the problem to be addressed, the type of field research to be undertaken, and the nature of the report produced.

LA. 6630-3. Landscape Technology I. This course will address the fundamental techniques of landscape architecture, including drafting skills, surveying and grading, and the natural systems as they affect construction. The application of road design and utility systems for site development also will be covered.

LA. 6631-3. Landscape Technology II. This course is a continuation of Landscape Technology I and focuses on the study of materials and methods employed in construction of site features and evolution of palette, techniques and theory of detailed design including pavements, fences, walls, stairs, revetments, basins, and fountains.

LA. 6641-3. Computer Applications in Landscape Architecture. The course introduces problem-solving methods and the relationship between those methods and the application of a computer to design problems. Introductory problems are given in
BASIC using the graphics package, a high-level language such as Pascal is used to explore language in more depth, and to conclude, a series of assignments introduces the graphics unit or high level language. Assignments in programming CAD problems are required.

LA 6686-3. Special Topics in Landscape Architecture. Various topical concerns are offered in landscape architecture history, theory, elements, concepts, methods, implementation strategies, and other related areas.

LA 6700-6. Advanced Landscape Architectural Design Studio V. This studio will focus upon the students’ elaboration and substantiation of personal ideas through complex design exercises which critically address contemporary landscape architectural theory. Emphasis is based upon a comprehensive landscape design project structured to test student ability to investigate ecological, socio-cultural aesthetics, and dimension in their design solutions.

LA 6701-6. Advanced Landscape Architectural Design Studio VI. The final studio is comprehensive in its approach. The major goal is to present a full range of complex design investigations and implementation strategies at various scales, while allowing the students to demonstrate their ability to synthesize all previous academic work.

LA 6840-1 to 3. Independent Study. Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to landscape architecture or urban design.

LA 6910-6. The Built Environment in Other Cultures II: Field Experience. Students will travel to their respective cities and undertake the agreed upon study proposals. The course intends not only to present a full range of complex design investigations and implementation strategies at various scales, while allowing the students to demonstrate their ability to synthesize all previous academic work.

LA 6930-3. Landscape Architecture Internship. This course is designed to provide professional practice experience to students, and is composed of eight hours per week work in a practicing professional’s office during the regular semester. The student is placed in a landscape architectural and/or design office by the School and receives credit instead of pay. Students must complete the second year level before taking this course.


**URBAN AND REGIONAL PLANNING**

**Program Director:** Peter V. Schaeffer

Urban and regional planning in the United States and other countries is involved in activities aimed at shaping the pattern of human settlements and providing housing, public services, and other crucial support systems that help support a decent urban living environment. Planning encompasses not only a concern for the structure and image of the built environment, but also a desire to harness the social, economic, political, and technological forces that give meaning to the everyday lives of men and women in residential, work, and recreational settings.

More specifically, urban and regional planning is concerned with: identifying social needs and designing and providing services and facilities to meet those needs; anticipating change and its impact on how people can and do live; understanding the way plans are made, decisions implemented, and actions evaluated and the means by which these processes can be improved; stimulating, guiding, and influencing actions of the private sector with respect to land use and land use transitions in urban, suburban, and rural areas; identifying potentially adverse impacts of human activities on the natural environment and mitigating those impacts; designing the city and the surrounding region to facilitate activities in which people need and desire to engage.

The Urban and Regional Planning Program at the University of Colorado at Denver is designed to prepare students for professional practice in urban and regional planning as well as for more advanced academic training in planning and other related fields. The degree of Master of Urban and Regional Planning (M.U.R.P) is awarded after successful completion of a course of study normally requiring about two years of full-time course work.

The objectives of the Urban and Regional Planning Program are: to clarify the behavioral and perceptual sources of urban and regional problems; to foster the appropriate use of policy, planning, design, and legal devices for creating urban and regional environments responsive to human needs and ecological principles; and to develop methods for evaluating urban programs, policies, and plans which have important human and natural environmental consequences.

**Master of Urban and Regional Planning**

The Urban and Regional Planning Program offers a curriculum leading to the degree of Master of Urban and Regional Planning (M.U.R.P), which requires two years of full-time study and a minimum of 51 credit hours. The M.U.R.P degree program is accredited by the Planning Accreditation Board, the Association of the Collegiate Schools of Planning, and the American Institute of Certified Planners. It consists of a core of 27 semester hours of courses in: Theory, Planning Methods, Spatial Analysis, Planning Law, History, Design and Planning Studio, and at least 24 semester hours of elective courses.

All planning courses qualify as electives. The student should select courses, however, that build on each other and together form a strong specialization. The Urban and Regional Planning Program requires that students see an advisor at least once a semester before registration to obtain approval for the course selection. Each student is assigned a member of the faculty as an advisor and mentor.

The particular strength of the Urban and Regional Planning Program is Physical Planning with emphasis on Environmental Planning and Land Development. Students are encouraged to consider appropriate courses in the Landscape Architecture Program to achieve greater skills and depth of knowledge. A dual Master of Urban and Regional Planning and Master of Landscape Architecture degree is offered.

Applicants to the Urban and Regional Planning Program are expected to present their application materials in a portfolio. The portfolio should include a resume which describes the applicant’s educational and professional background, a statement of professional goals and objectives, a list of courses that the applicant has taken which relate to planning, and a copy of a student or professional project or paper with a note explaining why the particular item was selected. The applicant may submit other relevant materials. The format must be 8½” X 11” and bound. A stamped, self-addressed envelope must be included if the portfolio is to be returned.
CORE COURSES

URP. 5501 (3) Planning History and Theory
URP. 5510 (3) Planning Methods I
URP. 5511 (3) Planning Methods II
URP. 5520 (3) Urban Spatial Analysis
URP. 5530 (3) Planning Law
URP. 6630 (4) Planning Studio I
URP. 6631 (4) Planning Studio II
URP. 6632 (1) Preparation for Professional Certification
LA 5530 (3) Site Planning

A thesis option (URP. 6950 Thesis Research and Programming and URP. 6951 Thesis) is available primarily for students who are interested in pursuing more advanced academic training in planning or related fields.

COURSE SEQUENCE

<table>
<thead>
<tr>
<th>COURSE SEQUENCE</th>
<th>CORE</th>
<th>ELECTIVES</th>
<th>CREDIT HRS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>YEAR I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FALL</td>
<td>URP. 5501 (3)</td>
<td>ELECTIVES (3)</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>URP. 5510 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>URP. 5530 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPRING</td>
<td>URP. 5511 (3)</td>
<td>ELECTIVES (3)</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>URP. 5520 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LA 5530 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YEAR II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FALL</td>
<td>URP. 6630 (4)</td>
<td>ELECTIVES (9)</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPRING</td>
<td>URP. 6631 (4)</td>
<td>ELECTIVES (9)</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>URP. 6632 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>24</td>
<td>51</td>
</tr>
</tbody>
</table>

SPECIALIZED COURSES

The elective courses enable students to explore in-depth an area of special interest. Students should build on the expertise which they already possess. This can be done by learning about a related specialty, or by increased specialization in an already existing area of expertise. The Urban and Regional Planning faculty has particular strengths in Urban Economic Development, Land Use, Environmental Planning, and Real Estate and Land Development. Students must take at least 24 hours of elective courses.

URBAN AND REGIONAL PLANNING COURSES

URP. 5500-3. Introduction to Urban and Regional Planning. This course focuses on the principles of urban and regional planning, theories of planning, community organization, basic techniques, changing philosophies in modern society, and the process of shaping community form.

URP. 5501-3. Planning History and Theory. This course provides an overview of planning history and theory. The philosophical, political, and economic roots of the various theories are discussed. Ideas are placed in the context of the planning profession's history and its present aims, interests, and ethics.

URP. 5511-3. Planning Methods I. This course focuses on the application of statistical, quantitative, and mathematical techniques, and computer applications for urban and regional planning and policy development. Major topics include types of data, sampling, basic probability distributions, hypothesis testing, regression and correlation, and an introduction to multi-variate and cluster analysis. Applications in planning and development are emphasized.

URP. 5513-3. Planning Methods II. This course continues further development and applications of techniques introduced in URP 5510, as well as other planning methods, models, and techniques. These include physical, social, and economic models, urban land use and development models, decision-working techniques, and linear and dynamic programming. Prer., URP. 5510 or consent of instructor.

URP. 5520-3. Urban Spatial Analysis. This course is an examination of the spatial structure of the urban system. The urban system is analyzed in terms of the "system of cities" and "city as a system." Major topics discussed include the economic theory of the origin of city, the rank-size and primate distributions, the location pattern and hierarchical structure of cities, functional classification of cities, urban growth and economic base, movement of population within and between cities, spatial pattern of land use and economic activity, spatial pattern of urban population density, and urban social space and urban cognition.

URP. 5530-3. Planning Law. This course focuses on the legal setting for urban and regional planning in the United States and major constitutional issues in the effectuation of planning policy. Contemporary controversies are put into the larger context of attempts by the judicial system to redefine the balance between individual rights and governmental power in an increasingly weakened society.

URP. 5532-3. Historical Development of Urban Form. An analysis of urban physical form from the origin of cities to the present. The emphasis is on the cities of western civilization and American urban planning. Major shifts in urban ideas, architecture, transportation, landscapes, and energy systems are discussed and evaluated using a slide-lecture format.

URP. 5533-3. Theories of Urban Form. A description and analysis of contemporary schools of thought on urban physical form. Theories will be evaluated according to the accuracy of their explanations of present urban form, the quality of their images of future urban form, and the practicality of their strategies for implementing their ideals using a slide/lecture/discussion format.

URP. 6624-3. The Built Environment in Other Cultures I: Research Design. This course intends to broaden students' perspectives by asking them to examine design within another culture. Each student will prepare a proposal of study including a statement of the problem to be addressed, the type of field research to be undertaken, and the nature of the report produced.

URP. 6630-4. Planning Studio I. This course focuses on plan design in urban and regional planning and explores basic concepts, techniques, and issues related to urban planning, urban design, site planning, and environmental awareness.

URP. 6631-4. Planning Studio II. The focus of Studio II is on plan making related to urban and regional planning. An understanding of the plan-making process is emphasized. Students will have direct experience with the various steps in planning, including data-gathering, goal-setting,
identification of alternatives, analysis, synthesis, and presentation of the plan. The plan may be for a city sector, a neighborhood, an entire community, a region, or it may be a policy plan. Where possible, students will work with an actual client. Prer., URP. 6630.

URP. 6632-1. Preparation for Professional Certification. This course is taken in the student's final semester before graduation. It provides for a comprehensive review of the planning literature and practice. The course coverage follows that of the American Institute of Certified Planners (AICP) examination. (Only open for planning students in their last semester or consent from the program director.)

URP. 6641-3. Social Planning. An increasingly important specialty in contemporary planning practice is social planning. This course covers the process of formulating public policies and designing, implementing, and evaluating programs in such areas as social services, housing, health care, employment, and education. Attention is given to the historical perspective and the present-day social and political context within which social policy formation and social planning occurs.

URP. 6642-3. Neighborhood Planning. An introduction to small area planning including survey of neighborhood and community theory, examination and critique research, and analytical techniques involved in neighborhood planning, and examines and analyzes existing plans of local neighborhoods.

URP. 6649-3. Environmental Planning I: Ecology. This course studies the physiography, cultural factors, and aesthetic criteria in relation to landscape and spatial organization and structure. It will cover data sources and interpretation, and it will look at environmental factors in development and siting analysis. Prer., URP. 5510 or consent of instructor.

URP. 6650-3. Environmental Planning II: Policy and Law. This course provides a comprehensive perspective on environmental planning policy. It focuses on major environmental issues and problems, methods of evaluation, and legislative responses. Prer., URP. 5530 or consent of instructor.

URP. 6651-3. Environmental Impact Assessment. The objective of this course is to provide the foundation for understanding the Environmental Impact Assessment process, its legal context, and the criteria and methods for procedural and substantive compliance. Prer., URP. 5530 or consent of instructor.

URP. 6652-3. Growth Management. This course examines environmental and land regulations such as zoning, subdivision controls, and growth management systems in the context of public policy. Emphasis is placed on case studies, the analysis of past and present practices, the improvement of existing systems, and the design of new regulatory systems. Prer., URP. 5530 or consent of instructor.

URP. 6653-3. Natural Resource Planning and Management. This course focuses on the study of the economic organization and use of natural resources. It covers the study of property rights and their impact on resource use, optimal depletion of non-renewable and use and management of renewable resources, applications of fisheries, forests, mineral resources, etc. as well as developing criteria for evaluation of environmental amenities; explores conflicts between growth and environmental quality.

URP. 6660-3. Real Estate Development Process. This course is a detailed analysis of components of real estate process and its relationship to the design profession as well as other key participants. Students will learn what variables are within the real estate development business, how they interrelate, and why projects succeed or fail.

URP. 6661-3. Real Estate Development Finance. This course focuses on financial analysis of real estate investments. The course covers topics including measures of value, capitalization rate, capital budgeting, debt and equity markets, and taxation. Cash flow and appraisal techniques, complex deal structuring, innovations in debt financing, syndications, tax shelters, tax exempt financing, and microcomputer applications are also covered.

URP. 6662-3. Real Estate Market Analysis. The course focuses on examination of techniques of market analysis. The course covers topics including business and construction cycles, regional and urban growth trends, restructuring of urban space, commercial and industrial location theories, and demographic analysis and projection techniques. Prer., URP. 5510 and URP. 5511 or consent of instructor.

URP. 6664-3. Fiscal Impact Analysis. This course is designed to provide an introduction to fiscal impact analysis procedures to students interested in the land development process. Several methodologies will be reviewed and assessed for their relevance in diverse circumstances. Prer., URP. 5510 and URP. 5511 or consent of instructor.

URP. 6670-3. Urban Economic Development. This course is an analysis of the public/private partnership in urban economic development including analysis of potentials, programs, and projects; financing urban economic development through federal grant programs; tax increment financing and other means; and economic theory of urban development.

URP. 6671-3. Regional Economic Development. This course is an analysis of regional patterns and processes of economic development. Theories and models for location patterns and processes of economic activities labor, industrial, and commercial site requirements; and economic development and growth and strategies are emphasized. Prer., URP. 5520 or consent of instructor.

URP. 6672-3. Urban Labor Market. This course provides a study of organization and functioning of urban labor markets and covers labor market segmentation, human capital theory, labor mobility, labor market signalling, and discrimination in labor markets. (Offered infrequently.)

URP. 6673-3. Transportation Planning I: Transport Network Analysis. The focus of this course is on the examination of several important aspects of the transport network including accessibility and connectivity, nodes and linkages and the volume and direction of flow of a transport network. Descriptive, predictive, and planning methods and models discussed include graph theoretical measures, connectivity matrices, gravity model, abstract mode model, entropy-maximization, trip generation model, and flow allocation models. Prer., URP. 5510 or consent of instructor.

URP. 6674-3. Transportation Planning II: Urban Transportation Planning. This course is a follow-up of the transport network analysis and involves an examination of major issues of urban transportation in the U.S. These include the role of transportation in urban development, the urban transportation system, relationship between land use planning and transportation planning, urban transportation planning processes, and selected case studies. Prer., URP. 5511 and URP. 6673 or consent of instructor.

URP. 6675-3. Planning and Public Finance. This course focuses on recent trends in financing local governments, revenue and expenditure analysis, budgeting for local governments with particular emphasis on the capital improvement budget, financing capital improvements through bond issues, and capital improvement and its relationship to long term planning.

URP. 6676-3. Urban Housing. This course involves an examination of planning and other aspects of urban housing, focusing primarily on the U.S. urban housing conditions with some references made to international conditions and comparisons. Major topics of the course include aggregate trends and patterns, housing in spatial context, the allocation process of housing markets and submarkets (supply/finance, demand/mobility-demographic change), housing problems and failures (substandardness, inequitable distribution, special group needs, segregation and discrimination, market problems), the role of government, and alternative approaches.

URP. 6680-3. Urbanization in Developing Countries. A description, analysis, and evaluation of urbanization and planning in less developed countries. The special problems of planning, housing, transportation, environmental quality, and economic development in cities of these countries are addressed. Comparisons are made among
cities of third-world countries and between third-world countries and first-world urban areas.

**URP. 6682-3. Housing in Developing Countries.** This course examines housing problems in developing countries and explores alternative policies, programs, and plans. Emphasis is placed on population growth and the impact on housing and urban development, housing demand, shelter, and services for the urban poor, the squatting and squatter-built housing, and comparison of government policies and programs addressing housing programs.

**URP. 6686-3. Special Topics in Urban and Regional Planning.** Various topical concerns are offered in urban and regional planning, theory, concepts, methods, case studies, and practice.

**URP. 6840-1 to 3. Independent Study.** Studies initiated by students or faculty and sponsored by a faculty member to investigate a special topic or problem related to urban design.

**URP. 6910-6. The Built Environment in Other Cultures II: Field Experience.** Students will travel to their respective cities and undertake the agreed upon study proposals. The course intends not only to help students consider their own design and planning attitudes, but also to help them see the world from a more balanced perspective. Prer., URP. 6624.

**URP. 6930-3. Planning Internship.** This course is designed to provide professional practice experience to students in urban and regional planning. The emphasis is on actual work experience in settings with client groups as the students assist them in determining solutions to their problems. Program Director's approval is required.

**URP. 6950-3. Thesis Research and Programming.** Prer., minimum of 24 credit hours earned toward completion of Master of Urban and Regional Planning degree.

College of Business and Administration and Graduate School of Business Administration

Dean: Donald L. Stevens
Associate Dean: William D. Murray
Associate Dean for Programs: Jean-Claude Bosch
Office: DR, Second Floor
Telephone: 595-4007

Director of the Executive Health Administration Program:
John P. Young

Director of the Executive M.B.A. Program:
John P. Young

Director of Health Administration Program:
Richard W. Foster

Executive Board of the Business Advisory Council
Bob Baker, Vice Chairman, Columbia Savings
Kermit L. Darkey, President, Mountain States Employers Council
Thomas J. Gibson, Executive Vice President, Gates Corporation
Gayle Greer, Vice President of Central Operations, American Television and Communications Corporation
N. Berne Hart, Chairman of the Board, United Banks of Colorado
Del Hock, Chairman and CEO, Public Service Company
Bruce M. Rockwell, Executive Director, the Colorado Trust
Gail Schoettler, Colorado State Treasurer

Faculty

Professors: Marcelle V. Arak (Finance), Gordon G. Barnewall (Marketing), Wayne F. Cascio (Management), Michael A. Firth (Accounting), H. Michael Hayes (Marketing and Strategic Management), Gary A. Koosnerger (Operations Management), James R. Morris (Finance), William D. Murray (Information Systems), Bruce R. Neumann (Accounting and Health Administration), Edward J. O'Connor (Management), Donald L. Stevens (Finance), Dean G. Taylor (Finance).

Associate Professors: W. Graham Astley (Management), Jean-Claude Bosch (Finance), Peter G. Bryant (Management Science and Information Systems), Edward J. Conry (Business Law and Ethics), Lawrence F. Cunningham (Transportation and Marketing), E. Woodrow Eckard, Jr. (Business Economics), Leland R. Kaiser (Health Administration), Dennis F. Murray (Accounting), John C. Ruhyna (Management and Business Law), Raymond F. Zammuto (Management).

Assistant Professors: Stephen P. Allen (Accounting), Ben-Hsien Bao (Accounting), Heidi Boerstler (Health Administration), Richard R. Brand (Marketing), Lloyd Brodky (Information Systems), Richard E. Cook (Finance), Richard W. Foster (Finance and Health Administration), James H. Gerlach (Management Science and Information Systems), Jeff E. Heyl (Operations Management), Kenneth A. Hunt (Marketing), Jajahir Karimi (Information Systems), Susan M. Keaveney (Marketing), Feng Yang Kuo (Information Systems), Anne Moeller (Management), Chandrasekaran Ram (Management), Marilyn Sargent (Management), Manuel G. Serapio (International Business), Marlene A. Smith (Information Systems).

Senior Instructors: Steven Cutler (Accounting), Cindy Fischer (Accounting), James H. Milleville (Information Systems).

Instructors: Charles M. Franks (Statistics), Robert D. Hoekenga (Accounting), Paul J. Patinka (Management), Barbara A. Radosevich (Finance), Charles A. Rice (Management), John Turner (Finance), Marianne Westerman (Finance), Martin J. Wyand (Management and Managerial Economics).

INFORMATION ABOUT THE COLLEGE

Located in the heart of the Rocky Mountain business community, the College of Business and Administration at the University of Colorado at Denver provides its students with the knowledge and skills necessary to become effective, responsible business professionals. This level of excellence in higher education is achieved by bringing together nationally recognized faculty and highly motivated, mature students in an intellectually challenging academic environment.

CU-Denver's College of Business is a "research institution," and our faculty are nationally recognized for their contributions to scholarly research. The information contained in university textbooks is first conceived through faculty research and is usually published in textbooks about six years later. Thus, a research-oriented faculty is writing and teaching concepts years before they are typically seen in textbooks. Accordingly, our students have the opportunity to be on the leading edge of business management theory and practice.

Our class schedules offer flexibility to meet the needs of full- and part-time students, with both day and evening classes. Whether you are an experienced working professional seeking an advanced degree, or preparing for a new career in the business world, you will gain the knowledge necessary to succeed in today's challenging business environment.

CU-Denver's College of Business can give you an edge over your competition.

Faculty

Our nationally recognized faculty is vigorous and enthusiastic about their teaching and research. Recruited from the nation's leading business schools, such as Berkeley, Harvard, Stanford, University of Chicago, University of Pennsylvania, UCLA, and Yale, many of them also bring years of valuable experience in private industry. Their interdisciplinary expertise, academic achievements, scholarly research, and business experience provide students with a dynamic learning environment, unequalled in the region.

Students

Unlike the students at a traditional college campus, many of our students are adult, working professionals who maintain full-time employment. Their success and experience enrich class discussions and interactions among students. Although a high percentage attend evening classes, a significant number are full-time students attending classes offered during the day. Following the current national trend, women constitute a very high percentage of the student body. Since admission
Eligibility for Placement

Cooperative Education is open to all students who have completed their freshman year, have maintained a grade-point average of 2.5, and have completed at least 12 hours of course work at CU-Denver (6 hours for graduate students). Some employers have additional requirements, i.e., U.S. citizenship, willingness to travel, and specific course work.

Scholarships and Financial Aid

Many programs for financial aid are administered by the Office of Financial Aid. Call 556-2886 for detailed information. In addition, the College of Business awards some departmental and general scholarships. The amounts of the awards and the number of awards vary each year. For additional information, contact the College of Business, 595-4007.

Each year, a number of undergraduate students are awarded Deans' Scholarships, Colorado Scholarships, and Regents Scholarships. These provide financial support for a portion of the students' tuition and fees.

The Purchasing Management Association of Denver awards an annual scholarship to students interested in careers in purchasing and the Colorado Chapter of the American Production and Inventory Control Society awards up to two annual scholarships to students interested in careers in operations management. For information contact the operations management faculty advisor in the College of Business.

Graduate tuition awards are available to students admitted to the Graduate School of Business Administration, based on a number of factors including financial need and academic performance. For additional information contact the Graduate Programs Office at 628-1245.

Student Organizations

Opportunity for association with other College of Business and Administration students, in varied activities intended to stimulate professional interest and to give recognition to scholastic attainment, is provided by the following student organizations:

- Beta Gamma Sigma — national honorary scholastic fraternity in business
- CSPA — Colorado Society for Personnel Administration (student chapter) for students interested in personnel or industrial relations
- CUAMA — student chapter of the American Marketing Association
- CU Venture Network — campus chapter of the Association of Collegiate Entrepreneurs, open to all CU-Denver students
- HASO — Health Administration Student Organization
- ISC — Information Systems Club
- MBA Association — University of Colorado at Denver association of master's students in business
- Phi Chi Theta — national professional business and economics fraternity
- Sigma Iota Epsilon — professional and honorary management fraternity
- SAS — Student Accounting Society

Institute for International Business

The Institute for International Business was created in August 1988 to help stimulate new business ventures through partnerships with foreign business schools and executives. It has three goals:

• To collaborate with business and government in promoting international economic development opportunities for Colorado and the Rocky Mountain region.

• To be a national center for providing hands-on training to foreign executives doing business with American firms.

• To become internationally recognized for research on competitiveness issues in the global economy of the 1990's.

The Institute will offer programs for senior management in business and government. The programs will identify and interpret trends affecting business in the global marketplace and the skills needed to conduct business in these markets. The programs also will put senior managers in contact with internationalists who are shaping the political, economic, and social environment for international business.

GENERAL ACADEMIC POLICIES

Academic policies which apply to all CU-Denver students are described in the General Information section of this catalog. The policies described below apply to both undergraduate students in the College of Business and Administration and graduate students in the Graduate School of Business Administration. Policies applying separately to undergraduate and graduate students are described under separate headings.

Each student is responsible for knowing and complying with the academic policies and regulations established for the Col-
le. The College cannot assume responsibility for problems resulting from a student's failure to follow the policies stated in this catalog. Similarly, students are responsible for all deadlines, rules, and regulations stated in the Schedule of Classes.

Academic Ethics

Students are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Cheating, plagiarism, illegitimate possession and disposition of examinations, alteration, forgery, or falsification of official records, and similar acts or the attempt to engage in such acts are grounds for suspension or expulsion from the University. Also, actions which disrupt the administrative process, such as misrepresentation of credentials or academic status, other forms of deception, or verbal abuse of College staff are grounds for suspension or probation. Any reported act of dishonesty may be referred to the College of Business Committee on Student Faculty Relations at the discretion of the dean, a member of the instructional staff, or other appropriate University representative. In particular, students are advised that plagiarism consists of any act involving the offering of the work of someone else as the student's own. It is recommended that students consult with the instructors as to the proper preparation of reports, papers, etc. in order to avoid this and similar offenses.

Admission to Business Classes

Admission to business classes is limited to students who have been admitted to the business program, and to other students as described in the separate undergraduate and graduate policy sections. The course admission criteria are designed to meet a number of objectives.

1. To assure access to business courses for students seeking a business degree.
2. To serve students in other colleges who have business-related education objectives or requirements.
3. To service non-degree students who have specific career or education goals.

Please refer to the Schedule of Classes each term for course availability.

Attendance Regulations

Students are required to attend classes on a regular basis. Absences must be arranged with the instructor and must conform with the instructor's policy on attendance.

Adding and Dropping Courses

See the General Information section of this catalog for the University-wide drop/add policies.

Withdrawal

See the General Information section of this catalog for University-wide withdrawal policies.

Administrative Drop

The College reserves the right to administratively drop students who are incorrectly enrolled in business courses. Instructors also may recommend to the College of Business and Administration office that students who fail to meet expected course attendance or course prerequisites be dropped from the course. Generally, students who are administratively dropped will not receive tuition refunds.

Appeal Procedure

Students should contact a business advisor in the College of Business and Administration office for appeal and petition procedures pertaining to rules and regulations of the College.

General Grading Policies

Plus/Minus Grading. College of Business faculty have the option to use plus/minus grading. For example, B+ corresponds to 3.3 credit points (for each semester hour), B- corresponds to 2.7 credit points.

Incomplete Grades. The only incomplete grade given in the College is IF. An IF grade is assigned only when documented circumstances clearly beyond the student's control prevent the student from completing course requirements (exams, papers, etc.). Generally, students must make up the missing work and may not retake the entire course. Students should not register for the class a second time but should make up the work with the instructor giving the IF. All IF grades must be made up within one year, or the IF will be automatically changed to the grade of F.

All incomplete grades must be completed and recorded at the Office of Admissions and Records no later than four weeks prior to graduation. The student is responsible for contacting the instructor concerning the removal of incomplete grades.

Grade Changes. Grades as reported by instructors are final. Grade changes will be considered only in cases of documented clerical errors and when a student is making up an incomplete grade (IW, IF). All changes must be made within one year after the course has been taken unless highly unusual circumstances can be documented and the change has been approved by the Undergraduate Appeals Committee for undergraduate courses, or the Graduate Appeals Committee for graduate courses. Normally, grade changes will not be considered for any circumstances after three years.

ACADEMIC PROGRAMS

A carefully designed curriculum to prepare students for success in business management is available for the student seeking either an undergraduate or graduate degree. The College offers courses leading to the Bachelor of Science (Business Administration), Master of Business Administration (M.B.A.), and the Master of Science (M.S.) degrees. The particular programs offered are:

Areas of Emphasis (B.S. in Business Administration)

Accounting
Finance
Human Resources Management
Information Systems
International Business
Management
Marketing
Operations Management
Transportation and Distribution

Graduate Programs

Master of Business Administration (M.B.A.)
Master of Science in Accounting
Master of Science in Finance
Master of Science in Health Administration
Master of Science in Management Sciences and Information Systems
Master of Science in Management and Organization
Master of Science in Marketing

Executive Programs

Master of Business Administration for Executives
Master of Science in Health Administration for Executives
UNDERGRADUATE DEGREE PROGRAMS

Associate Dean: Jean-Claude Bosch
Program Coordinator: Patricia Peckinpah Kemp
Program Specialist: Nancy Reed

The undergraduate curriculum leading to the Bachelor of Science (Business Administration) degree is intended to help the student achieve the following general objectives:
1. An understanding of the activities that constitute a business enterprise and the principles underlying administration of those activities.
2. The ability to think logically and analytically about the kind of complex problems encountered by management.
3. Facility in the arts of communication.
4. A comprehension of human relationships involved in an organization.
5. Awareness of the social and ethical responsibilities of those in administrative positions.
6. Skill in the art of learning that will help the student continue self-education after leaving the campus.

Undergraduate Admissions

Admission of Freshman Students.
Freshman applicants must have completed the college preparatory curriculum in high school, graduated in the top 30% of their high school class, and achieved a score of at least 24 on the ACT or 1100 on the SAT. See the General Information section of this catalog for further information on freshman admission.

Admission of Transfer Students.
Applicants who have completed work at other collegiate institutions should review the information on transfer students in the General Information section of this catalog. In addition to University policies, the College of Business and Administration evaluates course work to determine its appropriateness for the degree of Bachelor of Science (Business Administration). Students who have completed more than 24 quarter hours of transferable course work are evaluated for admission on the basis of their college grade-point average (GPA) without regard to their high school performance. To be automatically admitted, students must have a 3.0 overall GPA in the courses which would apply to the degree, Bachelor of Science (Business Administration), and a 2.0 overall GPA in business courses. Students with less than 3.0 overall will be automatically admitted if they have a 3.25 in the last 24 semester hours of applicable course work.

Students who do not meet either of these admission standards, but with a 2.6 in the last 24 hours of applicable work, are considered on an individual basis and are offered admission as space is available. For information about specific policies on transfer of credit, consult an undergraduate business program specialist.

Intra-university Transfer. Students who want to transfer to the College of Business and Administration from another college or school of the University of Colorado at Denver must formally apply at the College of Business office. Transfer deadlines are July 15 for Fall Semester, November 15 for Spring Semester, and April 15 for the Summer Term.

Students will be evaluated only on course work that applies to the business degree program. Generally, this will exclude course work of a technical or vocational nature and courses in activity PE and remedial subjects. Students who have completed at least 24 applicable semester hours will be evaluated on their college work; students with fewer than 24 transferable hours will be evaluated on the basis of both high school and college work.

Students will be considered for admission if their overall GPA in applicable course work from CU and all previous institutions is at least 2.6, or at least 2.6 in their last 24 hours. Applicants with less than a 2.0 GPA in business courses (from CU or other institutions) and overall CU GPA of less than 2.0 will be denied admission even though they meet the minimum requirements for consideration.

Students will be automatically admitted to the College of Business if they have an overall GPA of 3.0 or an overall GPA of 3.25 on their last 24 hours. All other applicants meeting the minimum requirements for admission as stated above will be pooled and ranked on the basis of their GPA in the last 24 hours. Pooled applicants will be offered admission as space is available.

To apply for an intra-university transfer, students must submit an Intra-University Transfer form and CU-Denver transcripts to a business program specialist. Transfer forms are available at CU-Denver Admissions or the College of Business office; transcript request forms are available at CU-Denver Records. The transcript must include the student's most recent semester at the University. Students with previous course work from other institutions are also required to submit a copy of their transfer credit evaluations (advanced standings).

Former Students. A CU student from another campus or a CU-Denver student who has not registered for three consecutive semesters (summers included) is considered a former student and must reapply for admission as a former student. Former CU-Denver business students may be automatically readmitted to the College for up to three years from the semester they last attended if they are in good standing (not on probation or suspension) in the College. Students who have not attended for more than three years, or who have completed 12 or more semester hours at another institution of higher education, must reapply as other former students and meet the admission and degree requirements applicable at the time they apply.

Old Work Policy. This policy applies to students newly admitted to the College of Business and former business students readmitted to the College after an absence of three semesters. Applicable credits up to five years old will be counted toward business degree requirements. Courses more than five years old will be evaluated individually for their current relevance to the degree program. Students may be required to update their knowledge by taking additional courses when past courses are outdated; in such cases, credit will be given for both courses. Generally, business courses more than eight years old will not apply toward degree credit.

Second Undergraduate Degree. Students may apply to the College of Business and Administration to earn a second undergraduate degree, provided the first undergraduate degree is in a field other than business. Students who are accepted for the second undergraduate degree will be required to pursue courses in the sequence normally required for a business degree. For example, if a student registered for a second degree has not had the required mathematics or general education courses, these must be taken before the student will be eligible to register for business courses. Further, the basic business courses (core courses) must be taken before a student begins to pursue the major field. Applications are available through the Office of Admissions and Records.

If a student applying for a second undergraduate degree has an academic record that justifies consideration for the graduate program, that student will be encouraged to consider one of the master's degree programs.

Double Degree Programs. Numerous career opportunities exist for persons trained in both a specialized field and management. For this reason, students may be interested in combined programs of study leading to completion of degree requirements concurrently in two fields.
Combined programs have been developed for engineering and business, and may be arranged for other professional combinations as well. For additional information, contact an undergraduate business program specialist at 628-1277.

Undergraduate Advising and Academic Planning

Admissions Advising. Persons not yet admitted to the College of Business can receive advising on course selection, admission requirements, and other matters from an undergraduate program specialist. To make an appointment, call 628-1277.

Admitted Students. Upon admission to the College, students execute a Graduation Contract which identifies the courses required to graduate. This contract contains all the information needed to select courses and monitor progress toward completion of requirements for the degree, Bachelor of Science (Business Administration). Business students are expected to assume responsibility for self advising. This includes scheduling courses each term, being familiar with all the policies and procedures of the College, and otherwise managing the student's academic career. Program specialists are available to answer questions about unusual situations; however, they do not provide ongoing information about course selection and scheduling.

Career advising is available from business faculty and from the Auraria Office of Career Planning and Placement Services, 556-3477.

Undergraduate Core Curriculum — University of Colorado at Denver

The faculty of the College of Business Administration, College of Engineering and Applied Science, and the College of Liberal Arts and Sciences have established a new core curriculum for undergraduate students. Beginning with the Fall 1990 Semester, all undergraduate students entering CU-Denver will be required to complete the undergraduate core curriculum independent of their college or major. Undergraduate students admitted prior to Fall 1990 will have a choice of either the new core curriculum or the requirements of their college in effect at the time of admission to the college.

The new undergraduate core curriculum seeks to provide all baccalaureate students with basic intellectual competencies in mathematics and computation, writing, oral communication, information literacy, and critical thinking. It also requires all students to come to terms with the basic knowledge areas of the natural and physical sciences, behavioral sciences, social sciences, humanities, and arts. Furthermore, the core curriculum promotes an awareness of cultural and racial diversity. The majority of the new core curriculum is designed to be completed during a student's freshman and sophomore years in order to provide the foundation for specific training in a student's major discipline.

The new undergraduate core curriculum for CU-Denver is outlined in the table below. Each college may augment the campus core curriculum. For example, the College of Liberal Arts and Sciences may require competency in a foreign language for the Bachelor of Arts degree. Additionally, a student's major may change the course requirements directly associated with a specific major. For example, engineers may have different core courses in the natural and physical sciences area.

Details concerning the core curriculum will be available in the advising office for each college by the beginning of the Fall 1990 Semester. Students should contact their college advising office for core requirements specific to their college and for a list of courses designed to satisfy core requirements.

<table>
<thead>
<tr>
<th>1. Intellectual Competencies</th>
<th>9 hours</th>
<th>6-9 hours in English with library component, 3-0 hours in Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Writing/Speech</td>
<td>3 hours</td>
<td>any computation course or by examination</td>
</tr>
<tr>
<td>b. Mathematics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Knowledge Areas</th>
<th>8 hours</th>
<th>two courses with laboratory, in one or two disciplines</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Natural and Physical Sciences</td>
<td>9 hours</td>
<td>minimum one course in Behavioral and Social, maximum two in a discipline</td>
</tr>
<tr>
<td>Biology, Chemistry, Geology, and Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioral Sciences AND Social Sciences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Behavioral Sciences Anthropology, Communication, and Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-6 hours</td>
<td>one or two courses in one or two disciplines</td>
<td></td>
</tr>
<tr>
<td>c. Social Sciences Economics, Geography, Political Science, and Sociology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-6 hours</td>
<td>one or two courses in one or two disciplines</td>
<td></td>
</tr>
<tr>
<td>d. Humanities History, Languages, Literature, and Philosophy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 hours</td>
<td>two courses in one or two disciplines</td>
<td></td>
</tr>
<tr>
<td>e. Arts Fine Arts, Music, and Theatre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Multicultural Diversity</td>
<td>3 hours</td>
<td>one upper division course from approved list</td>
</tr>
</tbody>
</table>

1 Contact college advising offices for specific courses that meet these requirements.
Graduation Requirements

The Bachelor of Science (Business Administration) degree requires the following:

Total Credits. A total of 120 semester hours.

Area of Emphasis. Completion of at least 12 semester hours of approved courses in the area of emphasis.

Residence. At least 30 semester hours of business courses must be completed after a student's admission to the College. The 30 hours for residence must include MGMT. 4110 and MGMT. 4500, the 12 hours in the area of emphasis, and 12 hours in other business courses (core and/or electives).

Grade-Point Average Requirement. To graduate, a student must maintain a minimum cumulative scholastic grade-point average of 2.0 for all courses attempted at the University acceptable toward the BS (Business Administration) degree, 2.0 for all business courses, and 2.0 for the four courses in the student's area of emphasis.

Undergraduate Honors. Upon recommendation of the faculty, students who demonstrate superior scholarship are given special recognition at graduation. Students must achieve an overall University of Colorado grade-point average of 3.3 and a grade-point average of 3.5 in all business courses taken at the University of Colorado to be considered for cum laude. Those who achieve an overall University of Colorado grade-point average of 3.5 and a grade-point average of 3.7 in all business courses taken at the University of Colorado will be considered for magna cum laude.

Filing for Graduation. Students must file an Undergraduate Candidacy form and Diploma Card, and request a graduation evaluation (senior audit) prior to registering for their final semester. Failure to do so will delay graduation. Also, students desiring to change their area of emphasis after filing for graduation must have the change approved by the graduation supervisor prior to registering for their final semester. Changes after that time will delay graduation.

Business Program Requirements. Satisfaction of all the following requirements:

Program Requirements Semester Hours
Communications and composition ........................................... 6
Mathematics .............................................................................. 6
Political science ......................................................................... 6
Introductory sociology or cultural anthropology ............................. 3
Natural science ........................................................................... 6
Principles of economics .............................................................. 6
General psychology ................................................................. 3
Social-humanistic elective .......................................................... 3
Business core requirements ....................................................... 30
Area of emphasis ....................................................................... 12
Electives .................................................................................... 39
Total Semester Hours .................................................................. 120

Detailed descriptions of courses which satisfy program requirements are presented below:

Program Requirements Semester Hours
Communications
Required: One English composition (ENGL. 1020 or 1034) and one speech course (CMU. 2021 or 2101)
Mathematics
Required: MATH. 1070 Algebra for Business and Social Science and MATH. 1080 Polynomial Calculus.
College-level algebra may be substituted for MATH. 1070. Six semester hours of sequential college-level calculus (i.e., MATH. 1041, 2411) may be substituted for MATH. 1070 and 1080.
Political Science
Required: PSC. 1001 and 1101. The following courses also will fulfill the PSC. 1001 requirements: PSC. 3042, 3062, 3105, 3404, 3532, 3554, 3656.
Introductory Sociology or Cultural Anthropology .................................. 3
Natural Science ........................................................................... 6
Select courses such as biology, chemistry, or physics. Astrogeophysics, earth science, physical geography, and geological science also are acceptable. Mathematics, anthropology, and psychology are not appropriate courses for this requirement
Economics .................................................................................. 6
Six hours of economics (macro and micro principles) are required. When ECON. 3000- or 4000-level work is available from a business program specialist)
Psychology .................................................................................. 3
PSY. 1002 is recommended.
Social-humanistic elective .......................................................... 3
Select from the following courses:
History course (1000 or 2000 level); a behavior psychology course (PSY. 3135 or 3155 are strongly recommended); PHIL. 1012, 1200, or 2200; Cultural Anthropology or SOC. 1001, 1190, 2500, 3001, 3012, 3020, 3030, 3052, 3480.
(Sociology and Cultural Anthropology courses are only acceptable if they are not used to fulfill the introductory Sociology or Cultural Anthropology requirement.)
Core Requirements ....................................................................... 30
Complete all of the following courses:
ACCT. 2000 Introduction to Financial Accounting
ISMG. 2000 Business Information Systems and the Computer
QUAN. 2010 Business Statistics
BLAW. 3000 Business Law
FINC. 3300 Basic Finance
MKTG. 3000 Principles of Marketing
MGMT. 3300 Management and Organization Behavior
OPMG. 3000 Operations Management
MGMT. 4110 Business and Society
MGMT. 4500 Business Policy and Strategic Management
Areas of Emphasis ........................................................................ 12
Accounting ................................................................................... 9
Finance
Human resources management
Information systems
International business
Management
Marketing
Operations management
Transportation and distribution management
Electives
Business electives ......................................................................... 9
Free electives .............................................................................. 15

Guidelines for Elective Credits. Elective credits should be selected carefully because not all classes are acceptable. Generally, to be acceptable, electives must be taught by regular University of Colorado faculty, must have a form of assessment such as a term paper and/or examinations, and must be regular classroom-type classes. Course coverage must be college level, not repetitious of other work applied toward the degree, must be academic as opposed to vocational or technical, and must be part of the regular University offerings.

Specifically, the College will accept:

a. A maximum of 6 hours of the theory of physical education, recreation, and dance, and

b. A maximum of 6 hours of approved independent study, experimental studies, choir, band, music lessons, art lessons, and
c. A maximum of 12 hours of advanced ROTC providing the student is enrolled in the program and completes the total program.

The College will not accept:
Activity physical education classes, recreation, workshops, internships, orientations, dance, teaching methods, practices, and courses reviewing basic skills in computers, English composition, mathematics, and chemistry.

**SUMMARY OF PROGRAM REQUIREMENTS**

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>81</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective Courses</td>
<td>39</td>
</tr>
<tr>
<td>Total Required Semester Hours</td>
<td>120</td>
</tr>
</tbody>
</table>

**Model Degree Program**

The following sequence of courses is a guide to registration.

**Freshman Year**
- ENGL. 1020 or 1034. English Composition .......... 3
- CMMU. 2021 or 2101. Communication Theory or Public Speaking .......... 3
- MATH. 1070. Algebra for Social Science and Business .......... 3
- MATH. 1080. Calculus for Social Science and Business .......... 3
- P SC. 1001. Introduction to Political Science .......... 3
- P SC. 1101. American Political System .......... 3
- SOC. 1001. Introduction to Sociology .......... 3
- MGMT. 1000. Introduction to Business .......... 3
- Natural Science .......... 6
- Total .......... 30

**Sophomore Year**
- PSY. 1002. Introduction to Psychology .......... 3
- Socio-humanistic elective .......... 3
- QUAN. 1010. Business Statistics .......... 3
- Non-business electives .......... 9
- Total .......... 30

**Junior Year**
- MKTG. 3000. Principles of Marketing .......... 3
- FNCE. 3300. Basic Finance .......... 3
- MGMT. 3300. Management and Organizational Behavior .......... 3
- OPMG. 3000. Operations Management .......... 3
- Business electives .......... 3
- Non-business electives .......... 6
- Either business or non-business electives .......... 6
- Total .......... 30

**Senior Year**
- MGMT. 4110. Business and Society .......... 3
- MGMT. 4500. Business Policy and Strategic Management .......... 3
- Area of emphasis .......... 12
- Business elective .......... 3
- Either business or non-business electives .......... 9
- Total .......... 30

**Areas of Emphasis**

See individual areas of emphasis in this section for specific courses required.

**ACADEMIC POLICIES FOR SELECTING COURSES**

**Registration**
Instruction for registering for courses is contained in another publication called the Schedule of Classes, which is available before each semester. That publication lists the times when registration occurs, the place, and the courses offered.

**Maximum Units Per Term.** The normal scholastic load of an undergraduate business student is 15 semester hours, with a maximum of 18 hours during the fall / spring semesters and 12 hours during the summer term. Hours carried concurrently in the Division of Extended Studies, whether in classes or through correspondence, are included in the student's load.

**Repeating Courses.** A failed course (grade of F) may be repeated; however, the F will be included in the grade-point average and will appear on the transcript. A course in which a grade of D or better is obtained may not be repeated without written approval from a business program specialist. Courses repeated without approval may not be used in the grade-point average calculation.

**Courses From Other Institutions.** Business students must have the written approval of a business program specialist to register for courses (excluding MSC pooled courses) offered by other institutions. Credit will not be given for courses taken without approval. Grades of C or better must be earned to receive business degree credit. Generally, only non-business electives or lower division, non-business requirements are acceptable for transfer from other institutions once a student has been admitted to the College of Business. Business students who take more than 12 semester hours from another institution must reapply for admission to the College as transfer students and meet the current admission requirements.

**MSC Courses.** Business students may select their non-business required and elective courses from those offered in the "pool" of MSC courses. Grades of C or better must be earned to receive business degree credit; however, the grade is not computed in the CU grade-point average and is treated like other transfer credits. Non-pooled, MSC business courses may not be taken for CU-Denver business degree credit.

**Graduate Level Courses.** With prior written approval of a business program specialist, students may take up to a maximum of 6 semester hours of graduate level non-business elective credits. Students must earn grades of B or better in graduate courses in order to apply the credits toward business degree requirements.

**Pass/Fail.** Only non-business elective courses may be taken pass/fail. Required business and non-business courses (natural science and social-humanistic elective included) may not be taken pass/fail. A maximum of 6 hours pass/fail credit may be applied toward the business degree. Courses taken in excess of the maximum will not be applied toward degree credit. Pass/fail determination must be made within the posted deadlines (at census dates) and may not be rescinded (unless approved by the Undergraduate Appeals Committee).

**Correspondence Courses.** Only 6 semester hours of credit taken through correspondence study (from regionally accredited institutions) will be applied toward the business degree. Business courses may not be taken by correspondence. All correspondence courses must be evaluated by a business program specialist to determine their acceptability toward degree requirements, and the program specialist's written approval is required prior to the student's registering for courses. Students should contact the Division of Extended Studies for course offerings and registration procedures.

**Independent Study.** Junior or senior business students desiring to work beyond regular course coverage may take variable credit courses (1-3 semester hours) as non-business electives under the direction of an instructor who approves the project, but the student must have the appropriate approval before registering. A maximum of 3 semester hours of independent study courses may be taken in any one semester; a maximum of 6 semester hours may be applied toward degree requirements.

An independent study request form must be signed by the student, instructor, department coordinator, and the Associate Dean for Programs.

**Study Abroad.** Transfer credit from study abroad programs is generally
limited to non-business elective credit. Students must meet with a business program specialist to determine course acceptability and for written approval prior to the semester in which they intend to study abroad. Information on the various programs is available at the Office of International Education on the Boulder campus.

ACADEMIC POLICIES FOR SUSPENSION AND PROBATION

To be in good standing, students must have an overall CU grade-point average (GPA) of 2.0 (C=2.0) or better for all course work attempted, and a 2.0 GPA or better for all business courses attempted. PE activity courses, remedial course work, MSC courses, and repeated courses not approved by a business advisor are not included in these averages.

When semester grades become available, students below the 2.0 GPA will be notified of 1) probationary status or 2) suspension. Students are responsible for being aware of their academic status at all times; late grades and/or late notification does not waive this responsibility. College rules governing probation and suspension are as follows:

1. Any student whose overall GPA, or business course GPA, is less than 2.0 will be placed on probation immediately. A student may be removed from probation when the overall GPA and business GPA have been raised to 2.0.

2. A student may remain on probation as long as the student maintains normal degree progress each semester as determined by the College and obtains each term on probation a term GPA of 2.5, and term business course GPA of 2.5, with no grade below a C. Failure to meet probationary provisions will result in suspension. Probationary status may continue only until the student has completed a maximum of 15 semester hours or five terms, whichever comes first; the student will be suspended if the GPA deficiency is not cleared within this time.

3. Suspended students may not attend the University of Colorado or any division of the University (including Extended Studies).

4. Students on suspension may petition for readmission to the College after a minimum of one year from the term in which they were suspended. Generally, petitions are granted only in unusual circumstances. Any suspended student readmitted to the College will be under contract and placed on a continued probation status until the GPA deficiency has been cleared. Such students will be automatically suspended if, at any time, their overall GPA or business GPA again falls below 2.0.

5. Students earning all failing grades or no academic credit for a semester will have a stop placed on their record and will not be permitted to register without a business advisor’s approval.

6. Combined degree students are required to maintain the same standards of performance as College of Business students in order to be continued in a combined program.

Areas of Emphasis

Each candidate for the B.S. (Business Administration) degree must complete the prescribed courses in an area of emphasis comprising a minimum of 12 semester hours taken at the University of Colorado at Denver. A 2.0 grade-point average is required for the four area courses. Typically, students select an area of emphasis after taking several of the core courses. They then complete the hours required for their selected area.

Students so desiring may complete a dual area of emphasis by careful selection of courses and use of elective hours for a second area of emphasis. Information about each area of emphasis is given below.

Accounting

Advisors: Stephen P. Allen, Ben-Hsien Bao
Telephone: 628-1244, 628-1249

Accounting courses are offered in several fields of professional accountancy at the intermediate, advanced and graduate levels. They provide preparation for practice in one or more of the following fields:

- Accounting and management control systems
- Auditing
- Financial accounting
- Managerial accounting
- Tax accounting
- Teaching and research

In all of these fields a thorough knowledge of the social, legal, economic, and political environment is needed. A high degree of analytical ability and communication skill is indispensable. Courses in English composition, speech, ethics and logic are desirable. Courses in statistics and information systems, beyond the required College of Business core courses, are highly recommended.

ACCT. 3310 (Managerial Cost Accounting) is a required prerequisite for the accounting area and applies as a business elective. Accounting majors should not take ACCT. 2020.

Required Courses Semester Hours
ACCT. 3230. Intermediate Financial Accounting II ....................................... 3
ACCT. 3320. Intermediate Cost Accounting .................................................. 3
Accounting elective (at the 4000 level) ......................................................... 3

Students planning to pursue accounting as a career usually take more than the above required hours. Many students take a total of about 30 hours of accounting, often taking two courses each semester in their junior and senior years. Students should work closely with the accounting faculty and business advisors in planning their accounting programs.

Accounting students often specialize in a particular topical area of accounting beyond the core. Examples of these specializations include the following recommended courses:

Financial Accounting and Auditing
CCT. 4240. Advanced Financial Accounting
ACCT. 4410. Income Tax Accounting
ACCT. 4420. Advanced Income Tax Accounting
ACCT. 4620. Auditing

Managerial Accounting and Systems
ACCT. 4330. Managerial Accounting Problems and Cases
ACCT. 4410. Income Tax Accounting
ACCT. 4420. Advanced Income Tax Accounting
ACCT. 4540. Accounting Systems and Data Processing
ACCT. 4620. Auditing
ACCT. 4800. Accounting for Government and Nonprofit Organizations

Graduate study in accounting is receiving increasing emphasis by professional organizations and employers. Students meeting admission requirements should consider continuing their education at the graduate level.

Finance

Advisor: Dean G. Taylor
Telephone: 628-1288

The principal areas of study in finance are financial management, monetary policy, banking, investments, and international finance. The study of finance is intended to provide an understanding of fundamental theory pertaining to finance...
and to develop the ability to make sound financial management decisions. Every endeavor is made to train students to think logically about financial problems and to formulate sound financial decisions and policies. It is necessary to understand the importance of finance in the economy and the functions and purposes of monetary systems, credit, prices, money markets, and financial institutions.

Emphasis is placed on financial policy, management, control, analysis, and decision making. Numerous job opportunities exist with financial institutions and in the field of business finance. ACCT. 2000 and ACCT. 2020 (or ACCT. 3310) are required prerequisites for the finance area. ACCT. 2020 will apply as a business elective.

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNEC. 4310. Business Finance I</td>
<td>3</td>
</tr>
<tr>
<td>FNEC. 4320. Business Finance II</td>
<td>3</td>
</tr>
<tr>
<td>FNEC. 4330. Investment and Portfolio Management</td>
<td>3</td>
</tr>
<tr>
<td>FNEC. 4350. Monetary and Fiscal Policy</td>
<td>3</td>
</tr>
</tbody>
</table>

**Recommended Electives**

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNEC. 4370. International Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>FNEC. 4340. Security Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FNEC. 4360. Bank Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Students should note that all finance courses are not offered every semester. Finance majors are encouraged to take additional accounting courses as business electives.

**Human Resources Management**

**Advisor:** Prof. Wayne F. Cascio

**Telephone:** 628-1215

Human resource management offers opportunities for students to develop professional competence in the areas of personnel administration and labor relations. Students acquire an understanding of and skills in developing and implementing human resource systems including recruitment, selection, evaluation, training, motivation, and union-management relations.

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT. 4340. Labor and Employee Relations</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4380. Human Resources Management: Employment</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4390. Human Resources Management: Legal and Social Issues</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4410. Human Resources Management: Compensation Administration</td>
<td>3</td>
</tr>
</tbody>
</table>

**International Business**

**Advisor:** John C. Ruhnka

**Telephone:** 628-1212

Increasingly, businesses are reorienting their thinking, planning, and operations to capitalize on opportunities that exist in the world marketplace. Every phase of business is affected by this reorientation. For individuals with the appropriate skills, training, and interest, international business offers excellent career opportunities.

The international business curriculum is designed to enhance and build on thorough training in basic business skills and to provide students with additional skills and knowledge appropriate to international business.

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNEC. 4370. International Finance Management</td>
<td>3</td>
</tr>
<tr>
<td>TRMG. 4580. International Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>MKTG. 4200. International Marketing</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4400. International Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Students should see an academic advisor for course scheduling.

A second area of emphasis in business is highly recommended. The course requirements for a second area can be included as part of the business and free elective hours. In addition, serious consideration should be given to either a minor or a certificate in international affairs, offered by the College of Liberal Arts and Sciences, and to the study of a foreign language.

**Management**

**Advisor:** John C. Ruhnka

**Telephone:** 628-1212

The management curriculum provides the foundation for careers in supervision and general management in a wide variety of organizations. It develops skills in management practice through an understanding of general management principles, individual and group behavior, organizational change and design, and human resources management.

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUAN. 3000. Intermediate Statistical Analysis for Decision Support</td>
<td>3</td>
</tr>
<tr>
<td>ISMG. 3300. Operations Research for Decision Support</td>
<td>3</td>
</tr>
<tr>
<td>ISMG. 3500. Logical Data Structures and Database Management Systems</td>
<td>3</td>
</tr>
<tr>
<td>ISMG. 4700. Computer and Information Technology Systems</td>
<td>3</td>
</tr>
<tr>
<td>OPMG. 4400. Planning and Control Systems</td>
<td>3</td>
</tr>
</tbody>
</table>
Marketing
Advisor: Gordon G. Barnewall
Telephone: 628-1296

Marketing is concerned with directing the activities of the organization toward the satisfaction of customer wants and needs. This involves understanding customers, identifying those wants and needs which the organization can best serve, guiding the development of specific products or services, planning and implementing ways to take products or services to the market, securing the customer's order, and finally, monitoring customer response in order to guide future activities.

In most organizations, marketing is a major functional area that provides a wide variety of career opportunities in such fields as personal selling and sales management, advertising and sales promotion, public relations, marketing research, physical distribution, product management, management information systems, and retail management. Increasingly, career opportunities exist in service businesses and not-for-profit organizations.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT. 3350. Managing Individuals and Work Groups</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4350. Conflict and Change in Organizations</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4370. Organization Design</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4380. Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>Management: Employment</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition to the four required courses, students may select marketing electives, business electives, and non-business electives that support their particular career orientations. The marketing faculty advisor can assist the student in choosing an appropriate set of electives to fit career objectives.

Operations Management
Advisor: Jeff E. Heyl
Telephone: 628-1280

Operations management studies are designed to prepare students for careers as production manager, operations manager, management analyst, or systems analyst in such private sector organizations as manufacturing, banking, insurance, hospitals, and construction, as well as in a variety of municipal, state, and federal organizations.

Operations managers may be charged with the design, implementation, operation, and maintenance of the production systems. Managerial activities could include forecasting demand, production planning and inventory control, scheduling labor and equipment, job design and labor standards, quality control, purchasing, and facilities location and layout.

The outlook for jobs in this area continues to be strong. This placement is aided by the student chapter of the American Production and Inventory Control Society and work intern programs provided to qualified students. Participation in live case research and consulting projects with local organizations is usually an integral part of this course of study.

Students whose major areas of emphasis are information systems, transportation management, accounting, or engineering will find the operations management 4000-level courses to be particularly well related to their courses of study. Students should plan their schedules carefully as required courses are not offered every semester.

Recommended Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISMG. 2200. Business Programming:</td>
<td></td>
</tr>
<tr>
<td>Structured COBOL</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 3350. Managing Work Groups</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4370. Organization Design</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4340. Labor and Employee Relations</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4380. Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>Management: Employment</td>
<td>3</td>
</tr>
<tr>
<td>QUAN. 3000. Intermediate Statistics</td>
<td>3</td>
</tr>
<tr>
<td>TRMG. 4500. Transportation Operation and Management</td>
<td>3</td>
</tr>
<tr>
<td>GEOG. 3411. Economic Geography: Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>GEOG. 4650. Location Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>

Students planning to take the APICS (American Production and Inventory Control Society) or NAPM (National Association for Purchasing Management) certification examinations should consult with an advisor to determine which elective should be taken.

Transportation and Distribution Management
Advisor: Lawrence F. Cunningham
Telephone: 628-1222

The curriculum in transportation management includes the role of transportation in society and the problems of traffic management within specific industries as well as the management of firms in the transportation industry. Such as airlines, trucking firms, railroads, and urban transit firms. International transportation management problems and policies are analyzed.

One of the recommended elective courses may be substituted with consent of the advisor for one of the required courses if there is a schedule conflict, if the course is not available, or if a student demonstrates a career need for such a course.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRMG. 4500. Transportation Operation and Management</td>
<td>3</td>
</tr>
<tr>
<td>TRMG. 4520. Problems in Surface Transportation Management</td>
<td>3</td>
</tr>
<tr>
<td>TRMG. 4560. Air Transportation</td>
<td>3</td>
</tr>
<tr>
<td>TRMG. 4570. Urban Transportation</td>
<td>3</td>
</tr>
<tr>
<td>TRMG. 4580. International Transportation</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4100. Physical Distribution Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Recommended Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT. 4340. Labor and Employee Relations</td>
<td>3</td>
</tr>
<tr>
<td>TRMG. 4510. Survey of Transportation:</td>
<td></td>
</tr>
<tr>
<td>Law and Freight Claims</td>
<td>3</td>
</tr>
</tbody>
</table>
OPMG. 4600. Purchasing. Materials Management and Negotiation. 3
MKTG. 4200. International Marketing. 3
GEOG. 4610. Urban Geography. Economic. 3
GEOG. 4630. Transportation Geography. 3

UNDERGRADUATE COURSES — ACCOUNTING


ACCT. 2020-3. Introduction to Managerial Accounting. Fall, Spring. The analysis of cost behavior and the role of accounting in the planning and control of business enterprise, with emphasis on management decision-making uses of accounting information. Note: Finance majors must take this course and accounting majors may not take this course to satisfy degree requirements. Prer. ACCT. 2000.


ACCT. 4410-3. Income Tax Accounting. Fall, Spring, Summer. Provisions and procedures of federal income tax laws and regulations affecting individuals and business organizations, including the management problems of tax planning and compliance. Prer. ACCT. 2020 or 3310 or 3220.


ACCT. 4620-3. Auditing. Fall, Spring, Summer. Generally accepted auditing standards and the philosophy supporting them, auditing techniques available to the independent public accountant. Pertinent publications of the AICPA reviewed. Prer. ACCT. 3230.


ACCT. 4840-variable credit. Independent Study.

ACCT. 4950-3. Special Topics in Accounting. Spring. Special topics, and professional developments in accounting. Prerequisites vary according to topic and instructor requirements.

UNDERGRADUATE COURSES — BUSINESS LAW

BLAW. 3000-3. Business Law. Fall, Spring, Summer. Provides an understanding of basic areas of law important to business managers and consumers. Topics include litigation, torts, contracts, and sales with overviews of consumer law and legal aspects of banking transactions. Prer. junior standing.


UNDERGRADUATE COURSES — FINANCE

FNCE. 3300-3. Basic Finance. Fall, Spring, Summer. Includes a study of the monetary system and other institutions comprising the money and capital markets; study of the financial manager's role in business; the investment of capital in assets; and financing the asset requirements of business firms. Prer. ECON. 2012 and 2022; ACCT. 2000; junior standing.


FNCE. 4320-3. Business Finance II. Fall, Spring. Develops analytical and decision-making skills of students in relation to problems that confronts financial management. Areas include planning, control, and financing of current operations and longer term capital commitments; management of income; evaluation of capital investments; and expansion. Case method of instruction. Prer. FNCE. 4310.


FNCE. 4350-3. Financial Markets and Institutions. Fall and Spring. This course focuses on the supply and demand for loanable funds, the process of money creation, the structure of interest rates, and the role of the central bank. Special attention is devoted to the impact of monetary and fiscal policies on interest rates, the flow of funds, and economic activity. Prer. FNCE. 4310.

Reviews foreign and international institutions and the foreign exchange process. Considers financial requirements, problems, sources, and policies of firms doing business internationally. Prer., FNCE, 3300.

FNCE. 4840-variable credit. Independent Study. FNCE. 4950-3. Special Topics in Finance. Research methods and results, special topics, and professional development in finance. Prerequisites vary according to topic and instructor requirements.

UNDERGRADUATE COURSES — INFORMATION SYSTEMS

ISMG. 2000-3. Business Information Systems and the Computer. Fall, Spring, Summer. A study of business information systems focusing upon computer hardware and software as they relate to business information. Includes computer programming, computer systems, and computer applications. The purpose of the course is to introduce the students to the concepts, vocabulary, and function of business information systems and the computer. Prer., MATH. 1070 or 1080 or 6 hours of nonremedial college mathematics.

ISMG. 2200-3. Business Programming: Structured I COBOL. Fall, Spring, Summer. An introductory course intended to provide the student with a thorough programming foundation in COBOL using structured programming concepts and techniques. The basic elements of the language are discussed and demonstrated through applications in a business environment. Prer., ISMG. 2000 or consent of instructor.

ISMG. 2210-3. Business Programming II: Files and Data Structures. Fall, Spring. This course is a continuation of ISMG. 2200. The student is introduced to advanced topics in COBOL and their application in business. Special emphasis is placed upon alternative physical data and file structures, their implementation in COBOL, and their use in a business setting. The use of system software and utilities will be integrated with the topics. Case studies may be used to illustrate applications of the material. Prer., ISMG. 2210 or consent of instructor; QUAN. 2010 is recommended.

ISMG. 3300-3. Operations Research for Decision Support. Fall. Objectives and models of operations research and their application in a managerial setting. Includes topics such as inventory models and control, simulation, linear programming topics, network models. Prer., QUAN. 2010.

ISMG. 3500-3. Logical Data Structures and Database Management Systems. Spring. This course is an introduction to database management systems, on-line query, and management control systems. It is concerned with database structure and design and the integration of the logical view of the data with its physical storage.

ISMG. 4650-3. System Analysis. Fall. This course introduces the student to basic system analysis tools and the procedures for conducting a system analysis. Topics to be covered may include system requirements, the initial analysis, the general feasibility study, structured analysis, detailed analysis, logical design, and general system proposal. The student will gain practical experience through projects and/or case studies. Prer., ISMG. 2210 or consent of instructor.

ISMG. 4660-3. Systems Design. Spring. This course is a continuation of ISMG. 4650 and discusses topics such as structured design, physical system design; detailed feasibility analysis; specification of input-output methods and formats, design of files, programs, and procedures; system testing; implementation; and system life cycle management. The student will implement these concepts through case studies and/or projects. Prer., ISMG. 4650 or consent of instructor.

ISMG. 4700-3. Computer and Information Technology. Fall. This course provides the IS student with a conceptual foundation in the areas of computer architecture, operating systems, programming translators, and telecommunications. It is intended to serve as a facilitating course to allow the IS student to more readily communicate with other technical members of the data processing community. Prer., ISMG. 2210 or consent of instructor.

ISMG. 4840-variable credit. Independent Study.

ISMG. 4950-3. Special Topics in Information Systems. Research methods are results, special topics and professional developments in information systems. Prerequisites vary according to topics.

UNDERGRADUATE COURSES — MANAGEMENT

MGMT. 1000-3. Introduction to Business. Fall, Spring, Summer. Nature of business enterprise. Role of business in our society; problems confronting business management. Career opportunities in business. Business students are advised to take this course during their freshman year, but may not take it in the junior or senior years. Open only to freshmen, sophomores, non-degree students, and music majors at all levels.

MGMT. 3300-3. Management and Organization Behavior. Fall, Spring, Summer. Emphasizes the application of behavioral science principles to an understanding of people and organizations. Motivation, authority, politics, and the role of groups in contemporary organizations are some of the topics covered. Students are urged to complete PSY. 1002 and SOC. 1001 before taking this course. Prer., junior standing.

MGMT. 3350-3. Managing Individuals and Work Groups. Fall, Spring, Summer. Examines what makes small groups effective in organizations. Develops the ability to analyze interpersonal and group behavior, and improve group functioning. Builds interpersonal and small group leadership skills. Prer., MGMT. 3300.

MGMT. 4110-3. Business and Society. Fall, Spring, Summer. An examination of interrelationships between business, society, and the environment. Topics will include perspectives on the socioeconomic-business system, current public policy issues, and social responsibilities and ethics. Prer., ECON. 2012 and 2022. Completion of PSC. 1101 and the sociology requirement is recommended before taking this course. Open to senior business students only.

MGMT. 4340-3. Labor and Employee Relations. Fall, Spring. Analysis of legal, political, social, and managerial aspects of collective bargaining and employee relations. Prer., MGMT. 3300.

MGMT. 4350-3. Conflict and Change in Organizations. Spring. This course is designed to help students understand common types of conflict within organizations and the strategies useful for resolving conflict. Techniques for managing change also are stressed. Prer., MGMT. 3300.

MGMT. 4370-3. Organization Design. Fall. Examines how to structure organizations to perform effectively. Emphasis is placed on the role of the task, technology, and environment as constraints on organization design. Prer., MGMT. 3300.


MGMT. 4390-3. Human Resources Management: Legal and Social Issues. Fall. Study of legal issues related to equal employment opportunity, occupational safety and health, and compensation, with emphasis on program implementation and evaluation. Reviews legal questions, guidelines and procedures, and regulatory agencies. It is recommended that students take MGMT. 4340 and 4380 before this course. Prer., MGMT. 3300.

MGMT. 4400-3. International Management. Spring. Examines the international business environment as it affects company policies and procedures. Integrates all the functions undertaken in international operations through in-depth analysis and comprehensive case studies. Prer., any two of the following: ECON. 4410, FNCE. 4370, MKTG. 4900, TRMG. 4580 or consent of instructor.

MGMT. 4410-3. Human Resources Management: Compensation Administration. Spring. Study of planning and administration of compensation systems,
including government, union, and labor market influences on pay; development of pay systems and employee benefits for nonmanagerial, managerial, and overseas employees. Prer., QUAN. 2010 and MGMT. 4380.

MGMT. 4500-3. Business Policy and Strategic Management. Fall, Spring, Summer. Emphasis is on integrating the economic, market, social/political, technological, and competition components of the external environment with the internal characteristics of the firm; and deriving through analysis the appropriate interaction between the firm and its environment to facilitate accomplishment of the firm’s objectives. Open only to business students in their graduation semester. Prer., completion of all business core courses.

MGMT. 4840-variable credit. Independent Study.

MGMT. 4950-3. Topics in Management. A number of different current topics in management will be offered under this course number. Consult the Schedule of Classes or the area coordinator for each semester’s topics.

UNDERGRADUATE COURSES — MARKETING

Note: MKTG. 3000 or an equivalent junior level course in basic marketing is a prerequisite for all marketing courses.

MKTG. 3000-3. Principles of Marketing. Fall, Spring, Summer. Provides a marketing management approach to the consideration of product planning, pricing, promotion, and distribution of goods and services. Emphasizes the role of the consumer and the social responsibility of marketing. Prer., ACCT. 2000 and junior standing.

MKTG. 3100-3. Marketing Research. Fall, Spring, Summer. Provides practical experience in research methodologies, planning an investigation, designing a questionnaire, selecting a sample, interpreting results, and making a report. Techniques focus on product analysis, motivation research, cost analysis, and advertising effectiveness. Prer., MKTG. 3000. QUAN. 2010.

MKTG. 3200-3. Buyer Behavior. Fall, Spring, Summer. Focuses on improving students’ understanding of consumer and organizational buying behavior as a basis for better formulation and implementation of marketing strategy. Blends concepts from the behavioral sciences with empirical evidence and introduces buyer behavior research techniques. Prer., MKTG. 3000.

MKTG. 4000-3. Advertising. Fall, Spring. Analyzes principles and practices in advertising from a managerial viewpoint. Considers the reasons to advertise, product and market analysis as the determining phase of the advertising program, media selection, creation and production of advertisements, copy testing, and development of advertising budgets. Prer., MKTG. 3000.

MKTG. 4100-3. Physical Distribution Management. Fall. Investigation and analysis of logistics of distribution systems for firms engaged in manufacturing and marketing. Component parts of each system are studied and analytical tools are presented for selecting alternatives which will attain distribution goals of the firm. Prer., MKTG. 3000.

MKTG. 4200-3. International Marketing. Fall. Studies managerial marketing policies and practices of firms marketing their products in foreign countries. Analytical survey of institutions, functions, policies, and practices in international marketing. Relates marketing activities to market structure and environment. Prer., MKTG. 3000.

MKTG. 4400-3. Marketing Institutions and Retailing. Emphasis placed on functions and strategies of all aspects of retail management, including site selection, merchandising, pricing, promotion, and inventory control. Also studies wholesaling and broker activities. Prer., MKTG. 3000.

MKTG. 4500-3. Advertising Management and Public Relations. Offered every 18 months. Focuses on advertising issues from an agency point of view. Considers issues of stimulating primary and selective demand, media selection, developing the advertising program or campaign, establishing budgets, evaluating results, and managing agency relations. Public relations issues incorporated in the campaign include effective publicity techniques, lobbying, and stockholder and community relations. Prer., MKTG. 4000.

MKTG. 4600-3. Business Marketing. Considers the problems of marketing goods and services to organizations buying for their own use or for incorporation in an end product. Focuses heavily on organizational buying behavior and analysis of demand for goods and services in both profit and not-for-profit organizations. Emphasizes development of marketing programs in the context of organizational demand for goods and services. Prer., MKTG. 3000.

MKTG. 4700-3. Personal Selling and Sales Force Management. Fall and Spring. Introduces students to principles of personal selling and issues in managing the sales force. Focuses on models of personal selling, recruiting, selection, training, compensation, supervision, and motivation, organizing the field sales force, sales analysis, forecasting, and budgeting. Prer., MKTG. 3200.

MKTG. 4800-3. Marketing Strategies and Policies. Fall, Spring. Focuses on the process of formulating and implementing marketing channels and product analysis. A case approach is utilized to develop the student’s analytical ability to integrate all major areas of marketing. Prer., MKTG. 3000 and six additional hours in marketing.

MKTG. 4840-variable credit. Independent Study.

MKTG. 4950-3. Special Topics in Marketing. Courses offered on an irregular basis for the purpose of presenting new subject matter in marketing. Prerequisites will vary depending upon the particular topic and consent of the instructor.

UNDERGRADUATE COURSES — OPERATIONS MANAGEMENT

OPMG. 3000-3. Operations Management. Fall, Spring, Summer. An introduction to the design and analysis of operating systems in manufacturing, services, and public sector organizations. Topics include facility layout and location, job design, work standards, quality and productivity, inventory planning and control, simulation, waiting line analysis, and linear programming. Prer., ACCT. 2000. QUAN. 2010. It is important to take this course in the junior year.

OPMG. 4400-3. Planning and Control Systems. Fall. Study of the design, implementation, and control of integrated operations, scheduling, and inventory planning and control systems. Topics include demand forecasting, aggregate planning, capacity planning, master scheduling, inventory management, material requirements planning, stockless systems, and operations control. Organizations studied include manufacturing, service, and public sector. Prer., OPMG. 3000.

OPMG. 4440-3. Quality and Productivity. Spring. Study of the various techniques to measure quality and productivity in organizations and the practical management issues related to implementing quality and productivity systems. Topics include statistical quality control, total factor productivity, quality circles, total quality control, work design and measurement, and quality and productivity management systems. Prer., OPMG. 3000 and MGMT. 3300.

OPMG. 4470-3. Strategic Analysis in Operations Management. Spring. Study of the analysis and formulation of operations management strategy and policy. Emphasis will be on the role of the operations function in the strategic processes of the organization. Decision making will be stressed through the use of case studies and the analysis of actual business situations. Prer., OPMG. 4400.

OPMG. 4600-3. Purchasing, Materials Management, and Negotiation. Fall. Study of the Purchasing function in manufacturing, service, and public organizations. Topics include source selection, make-buy analysis, material quality standards and specifications, value analysis, negotiations, and legal aspects. Prer., OPMG. 3000.

OPMG. 4840-variable credit. Independent Study.

OPMG. 4950-3. Special Topics in Operations Management. A number of different current topics in operations management will be discussed in the course. Consult the Schedule of Classes or contact the area coordinator for further information.
UNDERGRADUATE COURSES – QUANTITATIVE METHODS


UNDERGRADUATE COURSES – TRANSPORTATION AND DISTRIBUTION MANAGEMENT


TRMG. 4520-3. Problems in Surface Transportation Management. Spring. Analysis of surface modes with emphasis on the motor carrier industry. Topics include carrier operations, regulatory structure, pricing, market structure, design of services, routes and terminals, equipment, and private fleets. Case analyses and field studies will be used to develop decision-making skills. Prer., TRMG. 4500 or consent of instructor.


TRMG. 4580-3. International Transportation. Fall. Analysis of international transportation (primarily sea and air) in world economy. Detailed study of cargo documentation and freight rate patterns. Included are liability patterns, logistics, economics, and national policies of transportation. Prer., senior standing.

GRADUATE BUSINESS PROGRAMS (M.B.A./M.S.)

Associate Dean: Jean-Claude Bosch
Program Coordinator: Patricia Peckinpah Kemp
Program Specialist in Advising: Pete Wolfe
Program Specialist: Sharon Moritz

The Graduate School of Business Administration offers programs leading to the Master of Business Administration (M.B.A.), and the Master of Science (M.S.) in specific fields of business and health administration. In addition, the Master of Business Administration for Executives (Executive M.B.A.) is offered as a multi-campus program of the Graduate School of Business Administration, and the Executive Program in Health Administration (Executive M.S.H.A.) is offered through the Executive Programs.

The M.B.A., the Executive M.B.A., and the M.S. degrees in business are accredited by the American Assembly of Collegiate Schools of Business (AACSB). The M.S. in Health Administration is accredited by the Accrediting Commission on Education for Health Services Administration (ACEHSA).

Requirements for Admission to the M.B.A. and M.S. Programs

Admission to the graduate program in business administration (M.B.A. and M.S.) is granted only to students showing high promise of success in graduate business study. Admission is based on the following indicators of the candidate's likelihood to succeed in the program.

Academic Record. The bachelor's degree must be from a regionally accredited university. The total academic record is considered, including the grade-point average, the course of study, and the quality of the program.

Testing. The Graduate Management Admission Test (GMAT) is required. The GMAT test is given four times each year at numerous centers throughout the world. For information and to make application for the test, write to: Graduate Management Admission Test, Educational Testing Service, CN 6103, Princeton, New Jersey, 08541. The code number for CU-Denver's graduate business program is 4819.

Work Experience. A record of appropriate employment at increasing levels of responsibility is considered a positive indicator of the likelihood of successful completion of graduate work.

Seniors in this University who have satisfied the undergraduate residence requirements, and who need no more than 6 semester hours overall to meet requirements for a bachelor's degree, may be admitted to the Graduate School of Business Administration by special permission of the associate dean. They must meet regular admission criteria and submit complete applications by deadlines listed below.

Background Requirements. Students applying for graduate programs in business do not need to have taken their undergraduate degrees in business. The M.B.A. program is specifically designed so that the required courses cover the material needed for completion of the degree. There are no prerequisites needed to enter the M.B.A. program. Students with non-business backgrounds have completed the program successfully. It is expected, however, that students have a minimum level of basic personal computer proficiency as well as a good working knowledge of basic algebra. Should you feel inadequate in either area, please contact the Graduate School of Business Administration for information.

Applicants for the M.S. degree, however, may be required to take prerequisite courses, depending on the individual's academic and professional background. For more detailed information contact a graduate student advisor.

THE ADMISSION PROCESS

To be considered for admission, applicants for graduate programs other than Health Administration and Executive Program must:

1. Submit a completed application along with the nonrefundable application fee of $40 ($30 for M.S. applicants) prior to the application deadlines:
   - April 1 for Summer Term admission.
   - July 1 for Fall Semester admission.
   - November 1 for Spring Semester admission.

Early applications are recommended; early applications can receive early priority in registration and class enrollment. Applications received after these dates will not be considered for admission in that term or semester.

2. Have GMAT scores forwarded to the program by the Educational Testing Service. The code for CU-Denver's graduate business program is 4819.

3. Have two official transcripts (not student copies) sent from each college attended to the address below.

Personal interviews are not required. Students applying to the Cohort M.B.A. program may be required to submit an
additional nonrefundable deposit after they have been accepted into the graduate program. This deposit serves to request consideration for admission into the cohort program and is applied against regular tuition fees at the time of registration.

The mailing address for applications is:
Graduate Admissions
Graduate School of Business Administration
University of Colorado at Denver
1200 Larimer Street, Campus Box 165
Denver, CO 80204-5300

Applicants for the Executive M.B.A. and M.S. in Health Administration programs should consult the relevant sections for application information.

Academic Policies for Graduate Students

Advising. Prospective graduate students are encouraged to discuss admissions and program requirements with an advisor. In addition, as soon as possible after admission, students should schedule an appointment with a graduate advisor to discuss general degree requirements. Master of Science students should consult with the advisor to determine any background course work that may be required. All M.S. students need to file a formal degree plan during their first term in residence. All M.B.A. students must file a formal degree plan as soon as electives are considered. These plans, with appropriate signatures, will be filed with the Graduate School of Business Administration.

Course Load. The normal course load for full-time graduate students is 9-15 semester hours. However, because many students also are pursuing a career, it is possible to attend classes on a part-time basis at times convenient to the individual’s work schedule. Graduate courses are offered primarily in the evening hours to accommodate the working student.

Transfer of Credit. Upon approval of the Graduate Appeals Committee, a maximum of 6 semester hours of graduate work may be transferred from another AACSB-accredited master’s program.

Time Limit. M.B.A. students must complete the curriculum within five years from the date of first enrollment in the program. Courses older than 5 years generally will not be accepted for the degree. M.S. students must finish courses beyond those in the common body of knowledge courses within 5 years with reasonable continuity.

Students who have not been enrolled for three consecutive semesters must reapply for admission to the program. Readmitted students are required to complete degree requirements in effect at the date of their readmission.

Comprehensive Examinations. A comprehensive examination is not required for students pursuing the M.B.A. degree. A comprehensive examination is required of students pursuing some M.S. degrees; the M.S. advisor should be contacted regarding this requirement. Students must be registered for the semester in which the comprehensive examination is taken, normally the last semester of attendance.

Graduation. Students must file an application for Admission to Candidacy and a Diploma Card with the Graduate School of Business Administration no later than September 1 for December graduation, January 1 for May graduation, and June 1 for August graduation.

Minimum Grade-Point Average. A minimum cumulative grade-point average of 3.0 must be achieved and maintained in courses taken for a graduate business degree. All courses taken to meet the degree requirements, except transfer hours, are included in the grade-point average. If the student's cumulative grade-point average falls below 3.0, the student will be placed on academic probation and normally given one year of attendance in which to achieve the required 3.0 cumulative average. Failure to achieve the required average within the allotted time period will result in suspension.

Any grade below a C- (1.7) is a failing grade for graduate students. Graduate students must repeat a course for which they have received a grade below a C. Both the original grade and the grade for the repeated course count in the computation of the grade-point average.

To earn a grade of W (withdrawal without credit) in a course, a student must be earning a grade of C or better in the course. Students will not be permitted to withdraw from courses after the tenth week of the semester without the approval of the associate dean.

Admission to Graduate Business Courses

Admission to graduate level courses is reserved for students admitted to the graduate programs in business. Graduate students from other University of Colorado schools or colleges may be permitted to attend only with written permission of the associate dean and on a space available basis.

6000-level courses are reserved exclusively for graduate students.

5000-level courses may be offered simultaneously with 6000-level courses. Students should check with an advisor to confirm acceptability of 5000-level courses prior to registering.

MASTER OF BUSINESS ADMINISTRATION (M.B.A.)

The Master of Business Administration (M.B.A.) program provides the student a general background in management and administration that enables the student to have the breadth of exposure and depth of knowledge required for an advanced level in a management career. The program is devoted to developing the concepts, analytical tools, and communications skills required for competent and responsible administration of an enterprise viewed in its entirety, within its social, political, and economic environment.

The M.B.A. program is available in three different configurations: the INDIVIDUALIZED M.B.A. program, the COHORT M.B.A. program, and the EXECUTIVE M.B.A. program (see following section). The INDIVIDUALIZED M.B.A. and the COHORT M.B.A. both have the same curriculum requirements; they differ only in the flexibility of course scheduling and the time required to complete the program.

The INDIVIDUALIZED M.B.A. allows the scheduling of classes with maximum flexibility so students can progress through the program at their own pace by taking as little as one class per semester, or as many as five classes per semester, at times that are convenient to their work schedule. The program can be completed in as little as 16 months, or as long as 5 years.

The COHORT M.B.A. enables the student to complete the program in 3 years and one semester, taking 2 courses fall and spring semester and one in the summer term. Each group of entering students moves through the core courses as a cohort, taking prescribed core courses two nights per week, thus sharing their educational and professional experience. Electives are taken as available to meet individual objectives. For working professionals who can meet the time requirements of the COHORT program, it provides a unique and rewarding educational experience.

Candidates in both the individualized and the COHORT M.B.A. programs must complete specific requirements consisting of 16 courses (48 semester hours) as follows:
For additional information about the M.B.A. program contact a graduate student advisor at 628-1245.

**MASTER OF SCIENCE PROGRAMS**

Master of Science degrees (M.S.) are offered in the fields of accounting, finance, health administration, management, and management science and information systems.

The M.S. degree offers the opportunity for specialization and depth of training within a particular major field and, where allowed or required, a minor field. The specialization and expertise developed with the M.S. program prepares the student for more specialized staff positions in industry, the non-profit sector, and government.

The course requirements for the M.S. degree in each of the fields are divided into two components - common background and graduate core requirements. The common background requires at least 21 semester hours of business courses to develop general breadth and competence in the fields of business administration. These requirements may differ among degree programs. The common background requirements may be satisfied by equivalent graduate level work, or through undergraduate course work as approved by the advisor.

Subject to the above distribution requirements, students have a wide range of options available in selecting the 15 hours of electives. No area of emphasis is required for the M.B.A. degree, permitting students to choose a combination of courses appropriate for their individual career needs. If a student wishes to pursue an area of emphasis, several are available including accounting, finance, information systems/operations management, management, and marketing. Areas of emphasis all require 9 semester hours of electives (5000 or 6000 level) in addition to the area core courses. No thesis is required for the M.B.A. program.

**Notes and Restrictions**

- Core: Depending on demonstration of a strong background in one area, a maximum of one course may be waived in the core, although the 48 hour requirement is not reduced. An additional elective will then be substituted.

- Electives: No more than nine hours of elective graduate courses may be taken for credit in any one discipline or area of emphasis. Students may elect not to take any emphasis. Three hours maximum may be taken outside the Graduate School of Business Administration, but only with prior written approval of the associate dean.

- Subject to the above distribution requirements, students have a wide range of options available in selecting the 15 hours of electives. No area of emphasis is required for the M.B.A. degree, permitting students to choose a combination of courses appropriate for their individual career needs. If a student wishes to pursue an area of emphasis, several are available including accounting, finance, information systems/operations management, management, and marketing. Areas of emphasis all require 9 semester hours of electives (5000 or 6000 level) in addition to the area core courses. No thesis is required for the M.B.A. program.

**A. Common Background Course Work**

<table>
<thead>
<tr>
<th>Courses Required</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSN. 6020. Quantitative Business Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6060. Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6080. Management of Operations</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6100. Management Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6120. Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6140. Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6160. Legal and Ethical Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6180. Economic Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6200. Business Policy and Strategic Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Required Core Semester Hours 33

**Electives:**

One graduate course from each of three of the five following areas:

- Accounting, Finance, Information Systems/Operations Management
- Marketing, or Management
- Free electives

Total Elective Semester Hours 15

Total Required Semester Hours 48 for M.B.A. degree

**B. Accounting Courses Background**

<table>
<thead>
<tr>
<th>Courses Required</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT. 4410 and 4420. Income Tax and Advanced Income Tax Accounting</td>
<td>6</td>
</tr>
</tbody>
</table>

**C. Graduate Core in Accounting**

<table>
<thead>
<tr>
<th>Courses Required</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT. 6250. Seminar: Accounting Theory</td>
<td>3</td>
</tr>
<tr>
<td>ACCT. 6260. Seminar: Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT. &quot;core&quot; Any 2 advanced accounting courses (numbered higher than 6250)</td>
<td>6</td>
</tr>
<tr>
<td>MGMT. 6810. Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6100. Management Information Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Sub total 18

Electives (4) Four elective courses may be selected

Total Graduate Core Semester Hours 30

Certain graduate courses in accounting are offered only once a year. Consult a current Schedule of Classes for information about current course offerings. Note...
that ACCT. 5540, 6250, and 6290 are usually offered in the fall and other advanced courses are usually offered in the spring or summer.

Comprehensive Examinations. No comprehensive examinations are required in the major field of accounting. Comprehensive examinations may be required for some minor areas.

MASTER OF SCIENCE IN FINANCE

Advisor: Dean G. Taylor
Telephone: 628-1288

The M.S. degree in Finance provides the student with the necessary specialized expertise in the field to meet the need of businesses for staff specialists, and to prepare the student for further graduate work in the field of finance.

The M.S. program in finance consists of two components - the common background and the graduate core required courses.

A. Common Background Course Work

Courses Required Semester Hours
BUSN. 6000. Accounting for Managers .... 3
BUSN. 6020. Quantitative Business Analysis ......... 3
BUSN. 6040. Human Behavior in Organizations .... 3
BUSN. 6060. Marketing Management ...... 3
BUSN. 6120. Managerial Economics ......... 3
BUSN. 6160. Legal and Ethical Environment of Business .... 3
BUSN. 6180. Economic Environment of Business ......... 3
Total Semester Hours Required ....... 21

It may be possible to satisfy some of the common background requirements by other graduate or undergraduate course work, with the approval of the advisor.

B. Graduate Core in Finance

The M.S. finance core will consist of 30 semester hours (10 courses) beyond the common background requirements. At least six of these courses must be at the 6000 level or higher. A minimum of 21 semester hours (7 courses) must be chosen from regularly scheduled graduate finance courses (excluding independent study); the remaining 9 semester hours (3 courses) may be in finance or in related fields, as approved by the student’s M.S. advisor in finance. A student can elect to include a minor field with at least 9 semester hours approved by a minor field advisor, but a minor is not required.

The 21 hour finance requirement is met by the following requirements and options:

1. Required Courses
   BUSN. 6140. Financial Management
   FNCE. 6390. Advanced Finance Seminar

2. Choose at least 5 courses in finance from the list of regularly scheduled graduate classes in this catalog consultation with the graduate advisor.

Notes and Restrictions

If a student has taken at least 9 semester hours of upper division undergraduate finance courses within the last 5 years from an AACSB-accredited university, those courses may be substituted for BUSN. 6140. However, the student must still take at least 21 hours in finance at the graduate level.

The 9 semester hours (3 course) requirement may include courses related to the finance major as approved by the M.S. advisor. Areas of study that normally would enhance the student’s interest in finance would include economics, mathematics, statistics, accounting, information systems, and computer science. Other field also could be approved based on the student’s needs and objectives.

No comprehensive examination in finance is required.

M.S. students may choose to complete a thesis that is original research as approved by a committee of faculty members appointed by the M.S. advisor. Up to 6 semester hours of credit of independent study could be earned from thesis work.

MASTER OF SCIENCE IN HEALTH ADMINISTRATION

Advisor: Richard W. Foster
Telephone: 628-1286

The goal of the Master of Science in Health Administration (M.S.H.A.) degree is to prepare men and women who, after appropriate practical experience in responsible managerial positions, are capable of assuming positions as chief executive officers or senior administrators in complex, multi-service health care organizations or in organizations’ purchasing and health services.

The curriculum is a synthesis of management concepts and techniques that are applicable to any economic organization and tools that can be specifically applied to health and health services systems. The program emphasizes skills which heighten basic analytic and decision-making processes used by top level managers in selecting broad strategies for the institutions and by junior managers in administering sub-units of health care organizations. The faculty guide the students in their mastery of theoretical, conceptual, and quantitative topics.

The M.S.H.A. program has enjoyed continuous accreditation by the Accrediting Commission on Education for Health Services Administration (ACEHSA) since 1970. The typical course of study is 57 semester hours of graduate level course work for students entering without an undergraduate degree in business from an AACSB accredited program. The curriculum is based on a series of structured learning sequences with M.B.A. courses comprising the majority of the first full year, supplemented by several core health administration courses. Students with prior course work in business may petition to waive required business core courses.

The second academic year provides the student with advanced training in health administration. Within the 57 semester hours, the student must choose 9 semester hours of elective courses.

Required Business Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSN. 6000</td>
<td>Accounting for Managers</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6020</td>
<td>Quantitative Business Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6040</td>
<td>Human Behavior in Organizations</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6060</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6120</td>
<td>Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6160</td>
<td>Legal and Ethical Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6180</td>
<td>Economic Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>Total Semester Hours Required</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

It may be possible to satisfy some of the common background requirements by other graduate or undergraduate course work, with the approval of the advisor.

Required M.S.H.A. Core Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLTH. 6010</td>
<td>Medical Care Organization</td>
<td>3</td>
</tr>
<tr>
<td>HLTH. 6015</td>
<td>General Systems Theory</td>
<td>3</td>
</tr>
<tr>
<td>HLTH. 6020</td>
<td>Health Economics</td>
<td>3</td>
</tr>
<tr>
<td>HLTH. 6026</td>
<td>Institutional Management</td>
<td>3</td>
</tr>
<tr>
<td>HLTH. 6030</td>
<td>Health Sciences</td>
<td>3</td>
</tr>
<tr>
<td>HLTH. 6040</td>
<td>Management Accounting for Health Care Organizations</td>
<td>3</td>
</tr>
<tr>
<td>HLTH. 6050</td>
<td>Legal and Ethical Problems in Health Care Administration</td>
<td>3</td>
</tr>
<tr>
<td>Free Electives</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total Semester Hours</td>
<td>57</td>
<td></td>
</tr>
</tbody>
</table>
tive courses are available that focus on practice settings such as hospital administration, ambulatory care administration, or long-term care administration.

Management Residency: A management residency is optional, but recommended for all students, especially those with limited health care experience. The faculty of the program provide assistance to students in securing the residency, as well as regular consultation during the residency period. Information on the full range of local, regional, and national residencies is available in the program office.

Length of Program: The didactic portion of the degree will take at least two academic years since H.A. courses are offered only once each year and many require prerequisites. Part-time study is facilitated by many courses being scheduled for late afternoon or evening hours.

Admissions Process

Requirements for Admission: Selection of students is a multi-step process. When making application to the program for the M.S.H.A., candidates should send their applications to:

Graduate Admissions
Graduate School of Business Administration
University of Colorado at Denver
1200 Larimer Street, Campus Box 165
Denver, CO 80204-5300

Credentials or Requirements

1. Completed Application for Graduate Admission Parts I and II.
2. Four letters of recommendation from professional or academic acquaintances who are familiar with the applicant's academic/professional competence.
3. Satisfactory test score — Graduate Management Admission Test (GMAT) is required. When registering for the GMAT, use code #4819 (Denver, MBA) to have score report sent to the University of Colorado at Denver Graduate School of Business Administration.
4. $30 application fee.
5. Two (2) official transcripts sent directly from each college or university attended. A minimum baccalaureate degree is required.
6. A well formulated career plan articulated in a brief essay, and summarizing the applicant's reason(s) for seeking the degree.
7. Experience in the field of health services administration (preferred but not absolutely necessary).

Admission to the M.S.H.A. degree program is on a competitive basis. Therefore, these admission criteria represent minimum entrance qualifications expected of all students.

Deadlines. All credentials should be submitted at the latest by July 1 for Fall Semester, November 1 for Spring Semester, and April 1 for Summer Term. Applications will be reviewed in the order they are received. Early application increases the probability of acceptance.

For further information, brochures, and application materials contact the Graduate Program in Health Administration, Graduate School of Business Administration, University of Colorado at Denver, 1200 Larimer Street, Campus Box 165, Denver, CO 80204-5300, (303) 628-1245.

Health Administration Scholarships/Loans

Financial assistance is available for new and continuing students directly from the Graduate Program in Health Administration. Each year the following scholarships/loans may be awarded:

- Eugenie Sontag Award
- Kaiser-Permanente Scholarship/Residency
- Healthcare Financial Management Assn. continuing student scholarship
- Foster G. McGaw Scholarship Loan Fund
- Foster G. McGaw Scholarship
- Federation of American Hospitals' Foundation
- Colorado Health Administration alumni Association Scholarship Fund
- U.S. Dept. of Health and Human Services Traineeships

In addition, students are eligible to apply for financial aid directly from the University of Colorado Financial Aid Office. Call 556-2886.

MASTER OF SCIENCE IN MANAGEMENT AND INFORMATION SYSTEMS

Advisor: Gary A. Kochenberger
Telephone: 629-1273

The Master of Science degree in management science and information systems prepares students for management roles in the information systems field and for such careers as systems analysts, software engineers, data base administrators, and data processing managers. The curriculum emphasizes the application of computer technology within the business context.

The M.S. degree requires the student to complete the common background courses and the graduate core described below.

A. Common Background Course Work

<table>
<thead>
<tr>
<th>Courses Required</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSN. 6000. Accounting for Managers</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6020. Quantitative Business Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6040. Human Behavior in Organizations</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6060. Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6120. Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6140. Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6160. Legal and Ethical Environment of Business</td>
<td>3</td>
</tr>
<tr>
<td>Total Semester Hours</td>
<td>21</td>
</tr>
</tbody>
</table>

All students entering the M.S. in management science and information systems program should possess computer literacy at least equivalent to that attained by taking ISMG. 2000, CSC. 1100, or CSC. 1410.

It may be possible to satisfy some of the common background requirements with other graduate or undergraduate course work, with the approval of the advisor.

B. Graduate Core in Management Science and Information Systems

Thirty semester hours of approved graduate work are required. Each student's plan of study is developed by the student and the faculty advisor, considering the student's interests and background. The 30 semester hours may be taken entirely in information systems and closely related areas or may be divided between information systems and closely related areas or may be divided between information systems (21 hours) and a minor field (9 hours). At least 7 courses (21 hours) must be taken in information systems. Courses available for the major include:

- BUSN. 6100 Management Information Systems
- ISMG. 6020. Business Programming and Data Structures
- ISMG. 6060. Systems Analysis
- ISMG. 6080. Data Base Management Systems
- ISMG. 6100. Computer Technology
- ISMG. 6120. Data Communication
- ISMG. 6140. Systems Design
A. Common Background Course Work

Students in the M.S. in management and organization program can satisfy the common background requirements by taking the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSN. 6000. Accounting for Managers</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6020. Quantitative Business Analysis</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6060. Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6100. Management Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6120. Managerial Economics</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6140. Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>BUSN. 6160. Legal and Ethical Environment in Business</td>
<td>3</td>
</tr>
<tr>
<td>Total Semester Hours</td>
<td>21</td>
</tr>
</tbody>
</table>

It may be possible to satisfy some of the common background requirements by other graduate or undergraduate course work, with the approval of the advisor.

B. Graduate Core in Management and Organization

The core will consist of 30 semester hours (10 courses) beyond the common background requirements.

At least 7 of the courses must be 6000-level courses. A minimum of 21 semester hours must be chosen from regularly scheduled management courses (excluding independent study).

The remaining 9 semester hours (3 courses) may be in management and organization or in related fields, as approved by the student's M.S. advisor in management and organization. A student can elect to include a single minor field with at least 9 semester hours approved by a minor field advisor, but a minor is not required.

The 21-hour requirement is met by the following requirements and options:

Required Courses | Semester Hours |
-----------------|----------------|
BUSN. 6040. Human Behavior in Organizations | 3 |
MGMT. 6320. Organizational Development | 3 |
MGMT. 6360. Designing Effective Organizations | 3 |
MGMT. 6810. Human Resources Management | 3 |
MGMT. 6800. Special Topics | 9 |

C. Management and Organization Electives

Choose at least 9 hours of course work from the selections offered under the course designation MGMT. 6800, Special Topics in Management. Usually, two MGMT. 6800 sections will be offered each semester. Consult with the advisor for the year's special topics offerings.

Students can substitute a 6000-level management course for BUSN. 6040 if they have taken an equivalent upper division organizational behavior course within the last five years from an AACSB accredited university. In that case, students must complete 21 hours of management courses.

The 9 hour minor, if a student should choose to complete a minor, may be taken in another functional area of business, such as marketing, finance, management science and information systems or in another related discipline, such as psychology, sociology, or public administration. Other fields or combinations of courses can be approved based on a student's needs and career objectives.

Students are not required to take a comprehensive examination or complete a thesis in the major field.

MASTER OF SCIENCE IN MARKETING

Advisor: Susan M. Keaveney
Telephone: 628-1221

The objective of the Master of Science in Marketing is to prepare individuals with prior work experience for significant management responsibilities in the field of marketing, either in the private or the public sector. The degree is particularly appropriate for individuals who have an undergraduate degree in business.

The degree consists of two components: the common body of knowledge and the specialized courses that constitute the core of the M.S. in marketing.

A. Common Body of Knowledge

Students in the program must satisfy the AACSB Common Body of Knowledge requirements. These are met by the following courses:

ISMG. 6180. Information Systems Policy
ISMG. 6800. Special Topics
ISMG. 6840. Independent Study
ISMG. 6950. Master's Thesis

All of the above courses are 3 semester hours except ISMG. 6840, which is variable credit. A required course may be waived based on a faculty advisor's signature, but must be replaced with an information systems course. Minor fields may be chosen from a variety of business and non-business areas, in consultation with the student's advisor. A maximum of 6 semester hours of approved graduate work at other institutions may be included in the 30 semester hours. For business-related courses, the program must be accredited by the AACSB. Candidates for the M.S. degree must pass a comprehensive examination over their entire information systems program during the last semester of study.

M.B.A. in MANAGEMENT AND ORGANIZATION

Advisor: W. Graham Astley
Telephone: 628-1212

The objective of the Master of Science in Management and Organization program is to prepare individuals with prior work experience for significant managerial responsibilities in private and public sector organizations. The program provides students with a basic understanding of how to manage interpersonal dynamics, effectively design organizations, implement planned change, and develop and maintain the human resources necessary for effective performance. It also provides students with the opportunity to learn about specific managerial problems and issues, such as how to turn around poorly performing organizations, implement new technologies, etc. The degree is particularly appropriate for students having an undergraduate degree in a functional area of business, such as accounting, finance, information systems, or in a technical area, such as engineering or computer science.

The Master of Science in Management and Organization consists of two components: the common background and the specialized courses that constitute the graduate core.
The 9 hour minor, should a student choose to complete one, may be taken in another functional area of business such as finance or management science and information systems. Alternatively, it may be taken in a related discipline such as international affairs, economics, social psychology, or public administration. Other fields or combinations of courses can be approved, based on the student's needs and career objectives.

Students are not required to take a comprehensive examination or to complete a thesis.

EXECUTIVE PROGRAMS

MASTER OF BUSINESS ADMINISTRATION FOR EXECUTIVES

Administrative Director: Dennis Becker
Telephone: (303) 623-1888 or (800) 228-5778

The Executive M.B.A. Program provides executive-level students with a broad, rigorous two-year academic experience leading to the Master of Business Administration degree. The program is designed for persons who hold managerial positions in the private and public sectors. It builds upon the knowledge and experience of these executives with a sophisticated, challenging curriculum which can be pursued simultaneously with a management career.

The Executive M.B.A. Program emphasizes corporate planning, the organization in a complex, international environment; and the applied tools of management. Courses are taught through a variety of methods. Case studies, lectures, and computer simulation are combined with research projects and other teaching methods to provide students with tools useful in their present positions and applicable to more advanced responsibilities as they progress in their management careers.

The Executive Program comprises four semesters over twenty-two months. It begins the last week of August and runs through mid-June for two years. Classes meet for a full day, once a week, on alternating Fridays and Saturdays, making it possible for those who live outside the Denver area to participate.

Two courses are taken simultaneously throughout the program. The program is supplemented by an intensive seminar orientation at the beginning, and a two-day seminar at the conclusion of the first academic year. A second-year seminar is held at an international business center.

Faculty and Resources

The faculty are senior members of regular faculty of the Graduate School of Business Administration from all three of the University's campuses. The Executive M.B.A. Program is offered jointly by the Graduate Schools of Business Administration in Boulder, Colorado Springs, and Denver. They are selected to conduct these courses because their backgrounds enable them to make the strongest contribution to the program. These faculty members are nationally recognized, and all possess both practical managerial experience and a demonstrated ability to work effectively with executive level students.

Admission Requirements

The Executive M.B.A. Program is designed for men and women who have ten years of business or administrative experience, including at least three years in a managerial position. They should be part of senior management in a small organization or senior or middle management in a larger one, hold at least a baccalaureate degree, and have the ability to do graduate work.

In the selection process, significant attention will be given to the depth and breadth of the candidate's managerial experience, progression in job responsibility, total work experience, and ability to benefit from this integrative classroom/work environment. The Admissions Committee will base its decision on the application, former academic record, relevant test scores, the employer's nominating letter, other letters of recommendation, and if deemed desirable, personal interviews with the committee.

For application and information: Executive M.B.A. Program, Graduate School of Business Administration, University of Colorado, 1200 Larimer St., Campus Box 149, Denver, CO 80204, (303) 623-1888, (800) 228-5778.

EXECUTIVE PROGRAM IN HEALTH ADMINISTRATION

Administrative Director: Dennis M. Becker
Telephone: 623-1888

Program Sponsors

The Executive Program in Health Administration is a cooperative program of the University of Colorado at Denver.
DUAL DEGREE PROGRAMS

M.S.H.A./M.B.A.

Students may obtain the M.B.A. degree as well as the M.S.H.A. by completing a 66-credit hour program. In addition to the courses required for the M.S.H.A., students also must complete the following:

Additional Business Core Courses
BUSN. 6160. Legal and Ethical Environment of Business .......... 3
BUSN. 6180. Economic Environment of Business ....................... 3

The dual degree program also requires an additional 3 credit hours of electives and places additional restrictions on how electives may be taken.

Electives
One graduate course from each of three of the five following areas: Accounting, Finance, Management Science and Information Systems, Operations Management, or Marketing .................. 9
HLTH. Elective ............................. 3

M.B.A./B.A.

This program enables qualified students to earn a bachelor's degree from the College of Liberal Arts and Sciences (CLAS), and a Master of Business Administration from the Graduate School of Business Administration in five years. The program combines undergraduate general education with the graduate business curriculum.

Bachelor's candidates may major in any CLAS field (English, political science, biology, or fine arts are examples), and they must fulfill all the requirements for graduation from CLAS. During the senior year, the student begins taking graduate level courses in the M.B.A. program; these courses count as electives in the bachelor's program.

For further information about this program and the admission requirements, contact the College of Liberal Arts and Sciences Advising Office, 556-2555.

M.B.A./M.S. — Nursing Administration

The goal of the dual degree program (M.B.A./M.S. — Nursing Administration) is to prepare nurses who are capable of assuming senior level and CEO health administration positions in government, consulting, traditional health care organizations, and alternative delivery systems. The 66-credit curriculum is a synthesis of advanced management, health administration, and nursing content.

For information contact the program director in nursing administration, 394-8136.

M.B.A./M.S.

The Graduate School of Business Administration also offers M.B.A./M.S. dual degree programs for each function of business. Each program consists of a minimum of 66 semester hours of graduate work and leads to both an M.B.A. degree and an M.S. degree. Contact a graduate advisor for details.

GRADUATE COURSES

M.B.A. Core or M.S. Common Background Courses

The following graduate courses are open only to admitted graduate degree students.

BUSINESS

BUSN. 6000-3. Accounting for Managers. Fall, Spring, Summer. This course focuses on the use of accounting information in managerial decision making. Primary emphasis for the first half of the course will be on interpretation of financial statements, understanding accounting conventions and principles underlying the preparation of the statements, and current controversies regarding generally accepted accounting principles. The remainder of the course will stress managerial uses of accounting techniques such as budgeting, cost, volume, profit models, and performance measurement.

BUSN. 6020-3. Quantitative Business Analysis. Fall, Spring, Summer. This course will provide the student with basic qualitative analysis tools and techniques necessary for the analysis of business related problems. Topics covered include statistics, probability, sampling, regression, inference testing, and additional topics such as correlation, contingency tables, non-parametric techniques, and time series analysis.

BUSN. 6040-3. Human Behavior in Organizations. Fall, Spring, Summer. This course focuses on applications of behavioral science concepts to the management of organizations. This course emphasizes analysis and understanding of human behavior in organizations, and the results of such analyses to select appropriate strategies for managing. The course includes topics such as motivation, leadership, power
and conflict, group dynamics, technology, organizational design, and other factors affecting human performance. Special emphasis is placed on concepts used by managers in all functional areas of organization, such as accounting, production, finance, marketing, and engineering.

BUSN. 6060-3. Marketing Management. Fall, Spring, Summer. The course has two major objectives for the students: (1) understanding basic marketing concepts involving buyer behavior, product planning, pricing, channels for distribution and promotion, and (2) developing marketing decision-making capabilities based on strategic management and analytical skills. The overall objective is to integrate all the functional aspects of marketing with other functional areas of the firm and with the environment, particularly consumption markets, competition, the economy, legal and regulatory environment, and social evolution. Prer., BUSN 6000.

BUSN. 6080-3. Management of Operations. Fall, Spring. This course will study the tools and techniques of the management of the operations functions in business organizations. Topics covered will include resource management, linear programming, decision trees, scheduling and control systems, quality assurance techniques, productivity measurement, simulation, and the international elements of the operations function. Significant attention will be devoted to the study of the application of these tools to service and institutional organizations. Prer., BUSN 6020.

BUSN. 6100-3. Management Information Systems. Fall, Spring, Summer. This course provides an introduction to information systems from a managerial perspective. Topics include basic computer concepts such as hardware, software, data file design, structured computer languages, systems analysis and design, and decision support systems. Managerial, organizational and decision-making implications are stressed. Prer., BUSN 6120.

BUSN. 6120-3. Managerial Economics. Fall, Spring, Summer. This course has two objectives. A primary objective is to expose the student to the usefulness of microeconomic theory at the firm level. Through economic analysis, output demand and cost characteristics can be evaluated thereby allowing for production and marketing decisions consistent with overall firm goals. An additional focus is the operation of competitive economic markets and the effects of such competition on the firm. Topics include cost and price theory and estimation, forecasting, production theory, and pricing practices. The course is also designed to aid students' understanding of the business manager's role in light of organizational and societal objectives. Prer., BUSN 6000 and 6020.

BUSN. 6140-3. Financial Management. Fall, Spring. The purpose of this course is to introduce the student to the tools and techniques for making a firm's investment and financing decisions. These tools and techniques include the mathematics of interest, risk analysis, financial theory of value, capital budgeting, cost of capital, and financial analysis. The emphasis is on developing an analytic framework for financial decision making. The class utilizes current literature, text, and cases. Prer., BUSN 6000, 6020, and 6120.

BUSN 6160-3. Legal and Ethical Environment of Business. Fall, Spring, Summer. This course focuses on public, administrative, and regulatory law, and on the relation of business to the legal structure and ethical value systems which determine the parameters of business decisions. Topics include litigation, domestic and multinational trade regulation, the allocation of liability for products and environmental injuries, consumer and employee protection, regulation of capital markets, and business torts. BUSN. 6180-3. Economic Environment of Business. Fall, Spring, Summer. The objective of this course is to provide the student with an understanding of how economic policy affects and is affected by the national and international economic environment of business. As such, it focuses on the interaction of business and government as it relates to broader societal objectives. Measures of aggregate economic activity are introduced as a basis for discussion of monetary and fiscal policy. Concerns over economic growth, employment, prices, and interest rates are seen as motivations for stabilization and industrial policy. Market power, economic externalities, and other market failures are studied as motivations for antitrust policy and regulation of industry entry conditions, product pricing, and production methods. Prer., BUSN 6120.

BUSN. 6200-3. Business Policy and Strategic Management. Fall, Spring, Summer. The goal of this course is to develop a general management perspective on issues of management of the total enterprise. An important objective is the integration of knowledge acquired across functional area courses. Objectives of the course include the introduction of strategic concepts, analytical tools, and methodology. The primary focus is to provide the student with both strategy formulation and implementation skills. Prer., BUSN 6000, 6020, 6040, 6160, 6060, 6100, 6120, 6140, 6160, and 6180.

M.B.A. Electives/M.S. Courses

ACCOUNTING


ACCT. 5620-3. Auditing. Fall, Spring. Generally accepted auditing standards and the philosophy supporting them; auditing techniques available to the independent public accountant. Pertinent publications of the AICPA reviewed. Prer., ACCT. 3230.

ACCT. 5800-3. Accounting for Government and Non-profit Organizations. Spring. Planning and control of government and non-profit organizations. Includes program budgets, responsibility accounting, and fund accounting. Prer., BUSN 6020 or 3310 or BUSN. 6000 or ACCT. 3220.


ACCT. 6070-3. Management Accounting. Fall, Spring. This course is designed to provide M.B.A. students with a foundation in management accounting models and information, with emphasis on management decision-making uses of accounting information. Not recommended for candidates planning to sit for the CPA examination. Prer., BUSN 6000 or equivalent. Students who have taken ACCT. 3310 or 3320 or their equivalent may not take this course.

ACCT. 6140-3. Tax Planning for Managers. Fall. A federal tax survey course with an emphasis on tax planning for the M.B.A. student who wants to understand the impact of taxation on individual and business transactions. Course materials emphasize the application of individual, partnership, and corporate tax principles to the decision-making process. Students who have taken ACCT. 4410 may not take this course. Prer., BUSN 6000.


ACCT. 6260-3. Seminar: Managerial Accounting. Spring. This course focuses upon the conceptual foundations of managerial accounting. Behavioral and quantitative approaches regarding infor-

ACCT. 6290-3. Management Control Systems. Fall. This course focuses on the design and use of control systems which ensure that people in organizations behave consistent with the goals of the organization. Controls for communication, motivation, and performance evaluation — along with informational requirements — will be stressed through analysis of cases and classroom discussion. Prere., BUSN. 6000 or equivalent.

ACCT. 6350-3. Current Issues in Professional Accounting. In-depth analysis of current issues in the accounting profession, including ethics, development, and validity of standards and regulations. Prere., ACCT. 3230 or consent of instructor.

ACCT. 6410-3. Advanced Tax for Individuals. Spring. An advanced federal individual income tax course stressing the methodology used in tax research and in tax planning. Includes use of specialized tax software to address compliance with planning issues by solving complex case type real life situations. Prere., ACCT. 4410.

ACCT. 6420-3. Advanced Tax for Businesses. Fall. An advanced federal tax course stressing research and tax planning issues of corporate and partnership entities. Includes use of specialized tax software to address compliance and planning issues by solving complex case type real life situations. Consult the current Schedule of Classes for semester offerings. Prere., ACCT. 4420.

ACCT. 6450-3. Research Problems in Income Tax Accounting. Fall. A study of the methodology used in tax research and in tax planning, together with a study of some aspects of tax administration and tax practice, and of some aspects of the current law and proposals for its revision. Consult the current Schedule of Classes for semester offerings. Prere., ACCT. 4410 or 6410; or 4620 or consent of instructor.

ACCT. 6620-3. Advanced Auditing Theory. Spring. Development of auditing as a profession, including evolution of standards and audit reports. Historical and contemporary literature in the field reviewed. Prere., ACCT. 4620 or 5620.

ACCT. 6800-3. Special Topics in Accounting. Research methods and results, special topics, and professional developments in accounting. Prerequisites vary according to topics and instructor requirements. Consult the current Schedule of Classes for semester offerings.

FINANCE


FNCE. 6320-3. Seminar in Finance. Fall, Spring. This course will treat varying topics that are of special interest. Topics and emphasis could include subjects such as capital budgeting, capital structure theory, valuation of firms, mergers, bankruptcy, financial modeling, option valuation, etc. Prere., BUSN. 6140.

FNCE. 6330-3. Investment Management Analysis. Fall, Spring. The theory of investment management and security valuation, and portfolio management, including the analysis of investment risks and constraints on investment policies and objectives: the analysis and use of investment information; and the development and application of the tools for determining security values. Prere., BUSN. 6140.


FNCE. 6350-3. The Financial System. Fall. This course analyzes the role of financial institutions and financial markets in allocating credit to the various sectors of the economy. The course covers the financial system's responsiveness to economic activity and changing regulatory conditions, the processes by which risk is assessed and priced, and the behavior of interest rates. Prere., BUSN. 6140.


FNCE. 6390-3. Advanced Finance Seminar. Fall. This course is an advanced survey of the theory of finance and the empirical research developed from the theory. The student will study the quantitative models that are the basis for theory, and the empirical methods that have been used to confirm or disprove the hypotheses presented by the theory. The material will be presented through lectures and will be supplemented with student research presentations and recitation. Prere., BUSN. 6140.

FNCE. 6800-3. Special Topics in Finance. Experimental course offered irregularly for the purpose of presenting new subject matter in finance. Prerequisites will vary, depending upon topics covered. Consult the current Schedule of Classes for course offerings.

FNCE. 6840-3. Advanced Financial Management. Fall, Spring. With the consent of instructor under whose direction the study is undertaken.


HEALTH ADMINISTRATION

HLTH. 6010-3. Medical Care Organization. Fall. An introduction to the structure and function of the medical care delivery system. Includes basic concepts and measures of health, disease, quality, values, needs, and utilization; issues in health care management, institutions, and system organization; general issues in policy, reimbursement, and regulation; and broad community and organizational considerations in medical care organization.

HLTH. 6015-3. General Systems Theory. Fall. General systems theory is presented as a conceptual tool in health administration. Health is viewed as a subsystem of society, and interfaces among health and other social subsystems are analyzed. Broad social and cultural issues form a context for meaningful discussion of health planning and administration in the current and future decades.

HLTH. 6020-3. Health Economics. Fall. An intensive analysis of issues in health economics. Particular attention is given to "market failure" in health insurance and to alternative methods of containing health care costs, including both regulatory and market approaches. Prere., BUSN. 6120.

HLTH. 6026-3. Institutional Management. Spring. A colloquium designed to integrate major topics in the general management curriculum into relevant health administration issues. Current policies, problems, and issues across the board spectrum of health service administration are covered. Prere., HLTH. 6010, 6015, 6020, 6030.

HLTH. 6030-3. Health Sciences. Fall. This course introduces the student to principles of epidemiology: The student will demonstrate
the application of epidemiology analyses to
the prediction of health care service needs
of a population: to identify and integrate
temporary service delivery issues such as
access, quality of care, cost of care, program
and system development, and evaluation.
The course will assist the student in the
development of program planning and
evaluation skills. Prer., HLTH. 6010 and
BUSN. 6020.
HLTH. 6040-3. Management Accounting
for Health Care Organizations. Spring.
Designed to build on the accounting con­cepts introduced in BUSN. 6000 and to
develop proficiency in the decision-making
process or health care providers. Problems,
cases, and computer software programs
will be used to develop the practical applica­tion of management accounting techniques such as
cost/variable/profit and standard cost
models, budgeting, and analysis of variances.
Prer., BUSN. 6000, 6020 or consent of
instructor.
HLTH. 6050-3. Legal and Ethical Prob­lems in Health Care Administration. Spring.
Designed to acquaint the student with legal issues experienced by the health
administrator. Special emphasis is placed on issues such as malpractice, informed consent,
medical staff appointments, directors' and
administrators' liability, medical records, and
refusal of treatment. The course should make
the student aware of the multitude of legal and ethical problems which confront
the health administrator on a daily basis.
Prer., HLTH. 6010.
HLTH. 6630-3. Management Control in
Non-Profit Organizations. This course is
designed to develop a basic understanding of
the management control process and the
unique characteristics of nonprofit organiza­tions. Topics include budgeting, program­ming, operational control, and pricing
policies. Cases will be the primary mean to
integrate didactic materials with practical
applications. Prer., HLTH. 6010 or equivalent
or consent of instructor.
HLTH. 6650-3. Advanced Topics in
Health Care Financial Management. The
primary focus of this course will be an in­depth research report on a current problem in
health care financial management. A health care simulation exercise will be
utilized to integrate the financial manage­ment concepts introduced in the preceding
accounting and finance courses. Prer., HLTH.
6010 or consent of instructor.
HLTH. 6720-3. Ambulatory Care
Administration! The health administration
student is exposed to the rapidly developing
field of ambulatory care and HMO manage­ment. By examination of various ambulatory
care and HMO settings, problems in the
planning, implementation, administration, and
evaluation of ambulatory care are
developed. Prer. HLTH. 6010, or consent of
instructor.
HLTH. 6740-3. Multi-institutional
Management. Multi-institutional manage­ment is a developing trend in health
administration. Students are exposed to both profit and non-profit hospital, nursing home,
etc., networks. Shared services, merger,
management contracts, hospital acquisitions,
and satellite clinics are studied and
discussed. Prer., HLTH. 6010 or consent of
instructor.
HLTH. 6760-3. Rural Health Systems I.
Introduces the student to the history and
variation of rural health care in the United
States. Also to be examined are past
attempts to improve rural health and the
impact of past national programs affecting
rural health. The present status of rural
health in the U.S. will be explored. The
course will end with a review of private,
local, state, and federal programs directed
toward solutions for rural health problems.
Prer., consent of instructor.
HLTH. 6780-3. Health Care Marketing.
The application of marketing concepts and
principles to health care delivery. Discussion
will focus on the implications of a changing regulatory/competitive environment for
marketing health services. The use of
specific concepts and tools, and an
understanding of the variety of marketing
applications to the planning of health
delivery systems. Prer., BUSN. 6060 or con­sent of instructor.
HLTH. 6800-3. Special Topics in Health
Administration. Research methods and
results, special topics, and professional
developments in health administration.
Offered irregularly. Prerequisites vary accord­ing to topics and instructor requirements.
Consult the current Schedule of Classes for
semester offerings.
HLTH. 6840-variable credit. Independent
Study.
HLTH. 6950-variable credit. Master's
Thesis.
INFORMATION SYSTEMS
ISMG. 6020-3. Business Programming
and Data System. Fall, Spring. An
accelerated introductory course on program­ming business applications, with emphasis on
file processing. Topics include the COBOL
and PASCAL programming languages.
This course emphasizes information systems
analysis and the logical specification of the
system. The life cycle concept is used as the
basic framework for development, but there is
a recognition of alternatives in this develop­ment process. Management, organization,
technology, and economic perspectives are
considered. Prer., ISMG. 6020 and BUSN.
6100.
ISMG. 6080-3. Database Management

Systems. Spring. The database manage­ment course focuses on the analysis, design,
and implementation of database systems to
support today's business operations. Current
database models and database administra­tion issues will be discussed in detail. Prer.,
ISMG. 6020.
Fall. This course provides a conceptual founda­tion in the areas of computer architecture,
operating systems, programming translators,
and fourth-generation languages. Students
will study various computer architectures
ranging from microcomputers to minicom­puters to mainframe computers and
operating systems such as Unix, VMS, DOS,
and OS/VS. Prer. ISMG. 6020.
ISMG. 6120-3. Data Communications.
Fall. Develops skill and knowledge for
communication system design, dealing with
network protocols, wide-area network, local­area network, and management implications.
Course has a project orientation. Prer. ISMG.
6100.
ISMG. 6140-3. Systems Design. Fall. This
course integrates the areas of computer
technology, systems analysis, and systems
design in designing large-scale application or
decision support systems. The course
emphasizes modern techniques for the
measurement, specification, design,
implementation, and testing of information
systems. Prer. ISMG. 6060.
ISMG. 6160-3. Decision Support Systems
and Expert Systems. Fall. An introductory
course in how to design and construct deci­sion support systems and expert systems.
Knowledge representation and decision­making techniques will be discussed along with
artificial intelligence languages such as
Lisp and Prolog. Prer. IS. 6080.
ISMG. 6180-3. Information Systems
Policy. Summer. Designed for the
understanding of the overall information
needs of an organization and the role of the
counter based information systems. Topics
considered are strategic planning of informa­tion systems, management of computer
administration and technical personnel,
systems development management, the informa­tion systems exclusive, and social and legal
issues. Prer. BUSN. 6100, ISMG. 6020, 6060,
and 6080.
ISMG. 6800-3. Special Topics in Informa­tion Systems. A variety of advanced topics are
offered in this course. Consult the current
Schedule of Classes or the area coordinator
for current offerings.
ISMG. 6840-variable credit. Independent
Study.
ISMG. 6950-variable credit. Master's
Thesis.
MANAGEMENT
MGMT. 6320-3. Organizational Develop­ment. Summer. Fall. Instruction in the
analysis, diagnosis, and resolution of prob­lems in the organizing people at work. Models of
organizational change are examined. Group experiences, analyses of cases and readings are stressed. Prer. BUSN. 6040.
MGMT. 6300-3. Designing Effective Organizations. Spring, Summer. Examines how to design organizations within the context of environmental, technological, and task constraints. The emphasis is on learning how to recognize and correct structural problems through the analysis of existing organizations in which the students are involved. Prer. BUSN. 6040.
MGMT. 6800-3. Special Topics in Management. A number of different current topics in management will be offered each semester under this course number. The topics listed below were offered during the 1989-90 year. Some will be repeated during 1990-91 and new topics will be added. Please consult the Schedule of Classes for specific course offering and times, or contact the area coordinator for further information.

Power and Politics in Organizations. Political processes are examined: how people in organizations get power, keep power, and use power. This course is designed to increase students' capacity to analyze, understand, and use power effectively in organizations. Participation of class members is stressed.

Turnaround Management. Examines how organizations get into and out of trouble. Topics include: causes and strategies for reversing decline, improving decision making under crisis conditions, avoiding catastrophic organizational and interpersonal dynamics, and techniques for managing cuts in operations and personnel.

Entrepreneurship and New Business Formation. This course examines characteristics of the successful entrepreneur, exploration of entrepreneurial opportunities within large organizations, training in the motives of successful entrepreneurs, exploring the decision to go into business for one's self, and the development of procedural systems for establishing a new business.

Implementing New Technologies. The inability of American leaders to understand, predict, and manage human reactions to new technology is a critical factor currently inhibiting economic success. Causes of and solutions for this condition are examined, applied, and generalized to the management of both individual and organizational change.

Visionary Leadership. Leadership, not management, is critical to identifying and implementing the changes demanded by current competitive conditions. The challenges confronted and approaches utilized by visionary leaders will be examined. Participants will apply this material to their own careers by developing personal leadership plans.

MGMT. 6810-3. Human Resources Management. Fall, Spring. This course focuses on the management of human resources in organized settings. It is oriented toward the practical application of human resources management principles in the following areas: equal employment opportunity/affirmative action, human resources planning, recruitment, managerial selection, compensation and benefits, labor relations, training, career management, performance appraisal, and occupational health and safety.

MGMT. 6910-3. Marketing Strategy, Evaluation, and Development. Fall, Spring, Summer. Focuses on marketing strategy and marketing planning. Addresses the formulation and implementation of marketing plans within the context of the overall strategies and objectives of both profit and not-for-profit organizations. There is heavy emphasis on group projects and presentations. Prer. BUSN. 6040.

MGMT. 6920-3. International Marketing. Fall. Explores problems, practices, and strategies involved in marketing goods and services internationally. Emphasizes analysis of uncontrollable environmental forces, including cultures, governments, legal systems, and economic conditions, as they affect international marketing planning. Prer. BUSN. 6040.

MGMT. 6930-3. Sales and Sales Force Management. Spring. Focuses on issues in personal selling and managing the field sales force. Deals with organization, sales analysis, forecasting, budgeting, and operating, with particular emphasis on the selling task, recruiting, selection, training, compensation, supervision, and motivation. Prer. BUSN. 6040.

MGMT. 6940-3. Services Marketing. Spring. This course will inform students of basic modifications to marketing concepts as the U.S. economy changes in emphasis from physical products to services. It also will distinguish between function, organization, and structure in product versus service oriented firms. Lastly, it will concentrate on identifying difficulties in developing marketing plans and strategies in the service environment. Cases and projects with businesses will be used to demonstrate these concepts. Prer. BUSN. 6040.

MGMT. 6950-3. Marketing Research. Fall, Spring. This course will deal with the development of the marketing function and competition in a host of deregulating industries including advertising and sales promotion. The course focuses on advertising and promotion objectives, legal considerations, segmentation and targeting, creative and media selection and scheduling strategies, agency relations, advertising and promotion research, testing and evaluation, budgeting, and trial and purchase simulation through sales promotion tactics. The focus is on the managerial aspects of marketing communications as opposed to the creative function. Prer. BUSN. 6040.

MGMT. 6960-3. Marketing Function, Organization, and Strategy in Deregulating Industries. Spring or Summer. This course will deal with the development of the marketing function and competition in a host of deregulating industries including transportation, telecommunications, financial services, and health care. The objective of the course will be to demonstrate to students how marketing functions evolve and change as industries move from a regulatory umbrella to a competitive environment. Students will have an opportunity to see how regulation impacts the marketing function and strategy, and how the marketing strategy and function reacts to environments of limited or full competition. Prer. BUSN. 6040.

MGMT. 6970-3. Transportation and Physical Distribution Systems in the Modern Economy. Fall or Summer. This course will deal with the nature of transportation and logistical systems in the current manufacturing and service oriented economy. It will basically teach students the characteristics, economics, and current concerns of transportation systems, as well as the basics of logistical systems as they operate in modern corporations today. It will seek to provide students with concepts regarding these issues, as well as practical group projects. Prer. BUSN. 6040.

MGMT. 6980-variable credit. Special Topics in Marketing and Transportation. Courses offered irregularly for the purpose of presenting new subject matter in marketing and transportation. Prer. BUSN. 6040.

MGMT. 6990-variable credit. Independent Study.
MKTG. 6950-variable credit. Master’s Thesis.

OPERATIONS MANAGEMENT

OPMG. 5400-3. Planning and Control Systems. Fall. Study of the design, implementation, and control of integrated operations, scheduling, and inventory planning and control systems. Topics include demand forecasting, aggregate planning, capacity planning, master scheduling, inventory management, material requirements planning, stockless systems, and operations control. Organizations studied include manufacturing, service, and public sector. Prer., BUSN. 6080.

OPMG. 5600-3. Purchasing, Materials Management, and Negotiation. Fall. Study of the purchasing function in manufacturing, service, and public organizations. Topics include source selection, make-buy analysis, material quality standards and specifications, value analysis, negotiations, and legal aspects. Prer., BUSN. 6080.

OPMG. 6400-3. Planning and Control Systems. Spring. Study of the design, implementation, and control of integrated operations, scheduling and inventory planning and control systems. Topics include demand forecasting, aggregate planning, capacity planning, master scheduling, inventory management, material requirements planning, stockless systems, and operations control. Organizations studied include manufacturing, service, and public sector. Prer., BUSN. 6080.

OPMG. 6440-3. Quality and Productivity. Spring. Study of the various techniques to measure quality and productivity in organizations and the practical management issues related to implementing quality and productivity systems. Topics include statistical quality control, total factor productivity, quality circles, total quality control, work design and measurement, and quality and productivity management systems. Prer., BUSN. 6080 and 6040.

OPMG. 6470-3. Strategic Analysis in Operations Management. Spring. Study of the analysis and formulation of operations management strategy and policy. Emphasis will be on the role of the operations function in the strategic processes of the organization. Decision making will be stressed through the use of case studies and the analysis of actual business situations. Prer., OPMG. 6400, BUSN. 6000, BUSN. 6080.

OPMG. 6600-3. Purchasing, Materials Management, and Negotiation. Study of the purchasing function in manufacturing, service, and public organizations. Topics include source selection, make-buy analysis, material quality standards and specifications, value analysis, negotiations, and legal aspects. Prer., BUSN. 6080.

OPMG. 6800-3. Special Topics in Operations Management. A number of different current topics in operations management will be discussed in this course. Consult the current Schedule of Classes or contact the advisor for further information. Prerequisites will vary depending on topic and instructor requirements.

OPMG. 6840-variable credit. Independent Study.

QUANTITATIVE METHODS


QUAN. 6030-3. Seminar; Quantitative Methods. Application of quantitative methods to problems of business and industry, with emphasis on the functional fields of marketing, financial management, and production. Prer., QUAN. 6010 and 6020 or consent of instructor. One of the prerequisite courses may be taken as a corequisite.

QUAN. 6040-3. Multivariate Analysis. Topic in multivariate data analysis of particular interest to those engaged in business research. Includes techniques such as multivariate discriminate analysis, factor analysis, and multiple regression, and the use of standard multivariate statistical packages such as the SPSS package. Prer., BUSN. 6020.

QUAN. 6800-3. Special Topics in Quantitative Methods. A number of different topics in quantitative methods will be discussed in this course. Consult the current Schedule of Classes or contact the advisor for further information. Prerequisites will vary depending on topic and instructor requirements.

QUAN. 6840-variable credit. Independent Study.
Dean: William F. Grady
Associate Dean: Duane K. Troxel
Associate Dean for Curriculum and Instruction: Marc C. Mahlios
Office: NC 4001
Telephone: 556-2717

Dean's Advisory Council
Kathy Archuleta, Deputy Chief of Staff, Mayor's Office
Alan Arney, Assistant Manager, Colorado Association of Commerce and Industry
George Autobee, Assistant Director, Hispanic Institute
Kirk Brady, President, Jefferson County School Board
Dr. Roscoe Davidson, Superintendent, Englewood School District
Dr. Evie Dennis, Deputy Superintendent, Denver Public Schools
Dr. Garry Diford, Executive Director, C.A.S.E.
Leslie Franklin, Director, Governor's Job Training Office
Ed Garner, Member, Board of Education, Denver Public Schools
Mary Gittings, Program Director, Piton Foundation
William Grady, Dean, School of Education, CU-Denver
The Honorable Regis Groff
Jack Hale, Superintendent, Thompson Elementary School
Tom Howerton, Chairman, Colorado State Board of Education
Jim Huge, Superintendent, Cherry Creek Public Schools
Dick Jansen, Director of Communications, WICHE
Dennis Jones, President, NCHEMS
Gail Klapper, Council, Moye Giles O'Keefe Vermeire & Gorrell
Richard Koepp, Superintendent, Denver Public Schools
Karen Layton, Education Specialist, KCNC
Sister Cecilia Linnenbrink, Executive Director, Adult Learning Source
Russell Lofthouse, Principal, Homestead Elementary School
Carole McCotter, Board Member, Denver Public Schools
Jim McCotter, Senior Vice President, Public Service Company
The Hon. Al Meiklejohn, Colorado State Senate
Joan Mobley, Senior Vice President, Denver Chamber of Commerce

Frank Newman, President, Education Commission of the States
Rachel Noel, Former Chair, African American Studies, MSC, and Former Member, CU Board of Regents
Dr. John Peper
Jane Francan, Executive Director US West Foundation
Dr. Randy Quinn, Executive Director, C.A.S.B.
Dr. William Randall, Commissioner of Education, C.D.E.
Dan Rodriguez, Director, Hispanic Chamber of Commerce
Bea Romer, First Lady of Colorado
Herrick Roth, Director, Colorado Forum
Steven Seay, President, International Bank of Englewood
Mark Swanson, Vice President of Public Affairs, United Banks of Colorado
J. Ben Trujillo, President, Hispanic Chamber of Commerce

INFORMATION ABOUT THE SCHOOL

The School of Education offers master's degrees in 7 program areas, the Specialist in Education (Ed.S) degree, and a Ph.D. in Educational Administration, Curriculum and Supervision. The School is fully accredited by the North Central Association of Colleges and Secondary Schools. The Teacher Education Program is fully accredited by the Colorado State Board of Education and the National Council for the Accreditation of Teacher Education. Every faculty member in the School holds the doctorate and is a member of the graduate faculty. The faculty has a distinguished record of research, publication, and teaching. Since 1980 the faculty has authored over 200 refereed journal articles, as well as some 100 books and chapters in books. Currently the Educational Forum, an internationally recognized journal in education, is housed within the School and its editor is a member of the faculty.

The School also is home base for the new coordinated degree program mandated by the Colorado Commission on Higher Education. Coordinated degrees are offered across all three CU Schools of Education — at Denver, Boulder, and Colorado Springs. Dr. William F. Grady, who is Dean of all coordinated degree programs in education also is Dean at CU-Denver.

The School prepares a large percentage of teachers certified to teach in Colorado's K-12 schools. The Teacher Education Program is a graduate level program designed to prepare elementary and secondary teachers for a variety of school settings through academic work, professional studies, classroom teaching experiences, and community field experiences. Approximately half the course work required for certification may be applied toward a master's degree in curriculum and instruction. Teacher Education Programs are available at CU-Denver in:

- Elementary Education (Kindergarten-6th grade)
- Secondary Education (7th-12th grade: English, German, French, Spanish, Mathematics, Science, Social Studies)

Certified teachers also may seek second endorsements in the following areas:

- Elementary Education
- Secondary Education
- Administration and Supervision/Type D
- Counseling and Personnel Services
- Bilingual ESL
- Special Education
- Early Childhood Education
- Library Media
- Reading
- School Psychology

Master's degree programs are available for individuals who are not certified teachers in the following areas:

- Counseling and Personnel Services
- Curriculum and Instruction
- Special Education (Teacher 2)
- Educational Administration (Educational Technology emphasis)
- Educational Psychology

AFFILIATED PROGRAMS

Access Program

The Education Access Program is a CU system-wide School of Education program administered by William F. Grady, Coordinating Dean. Total degree programs are offered in counseling and personnel services, curriculum and instruction, special education, educational administration, and
instructional technology. Endorsement programs in bilingual education and English as a second language also are available. Most courses are held at community colleges in the 7-county metropolitan Denver area.

**Colorado Principals' Center**

**Director:** Lance Wright

The primary mission of the Center is to enable principals to shape their professional intellectual development. Activities include topical seminars, panel discussions, round table discussions, and ongoing special interest groups. Topical seminars feature individual presenters (primarily principals) who provide information on promising or successful practices, demonstrations or models, and opportunities for participant interaction. Panel discussions highlight current high-relevance topics, with panel and participant interaction in formal and informal settings. Special interest groups facilitate exploration of relevant problems and issues through brainstorming, literature review, and idea sharing during a series of meetings.

The Center also focuses on conducting and disseminating research. Projects have included a study of administrator role perceptions in school reform, the effects of principal peer coaching and reflection to improve instructional leadership, and a study of the developing professional identity of first year high school principals. Graduate students are hired by the Center as research assistants.

**Storytelling Conference**

Since 1978, the School has sponsored annual Storytelling Conferences which presented artists, storytellers, and yarnspinners from throughout the U.S. Conference organizer is Norma J. Livo, Professor of Education. The two-day conference, held in Denver, attracts up to 500 participants—many who register for graduate credit. Nationally known storytellers are featured, presenting tales and poems of other cultures, regions, and times. According to Dr. Livo, Storytelling has surged in popularity in recent years as the public and educators recognize its power both to captivate audiences and its uses as a teaching tool. It satisfies a need for one of the oldest forms of human communication and also contains unconscious levels of meaning that are not always obvious.

**Region VIII Resource Access Project**

**Director:** Harriet Abie-Boone

Under a contract funded by the U.S. Department of Health and Human Services, the Resource Access Project provides training and technical assistance to HeadStart centers throughout a six-state region. The Region VIII project, which serves 71 HeadStart organizations, is only one of ten such projects in the U.S.

Through the project, HeadStart staff will learn how to integrate handicapped children into regular HeadStart classrooms more effectively.

**ADMISSION (DEGREE PROGRAMS)**

Note: Students interested in teacher certification should refer to Teacher Education Programs in this section of the catalog for requirements and application procedures.

Prospective degree candidates (master's, specialist, Ph.D.) should request application forms from the Office of Student Services, NC 4001, 556-4386. The application packet contains application materials and information regarding admission requirements for each program area as well as testing requirements and recommendation forms.

Application papers and all supporting documents (including two official transcripts from each college or university attended, four letters of recommendation, GRE or MAT scores, and the $30 application fee) must be submitted to the Office of Student Services by March 1 for Summer Term, May 1 for Fall Semester, or October 1 for Spring Semester.

Official transcripts must be sent directly from each college or university to the School of Education. They may not be submitted by the student.

Application materials and fee, transcripts, and recommendations must be submitted by the appropriate deadline to:

University of Colorado at Denver
School of Education
Campus Box 106
1200 Larimer Street
Denver, CO 80204-5300

**Degrees and Areas of Specialization**

The following programs, offered by the School of Education, cover a wide range of professional and academic interests.

**M.A.**

Counseling and Personnel Services, options include:

- College Student Personnel
- Community/Agency Counseling
- Counseling and Human Resource Development
- Public School Counseling
- Marriage and Family Therapy

Curriculum and Instruction, options include:

- Elementary Education
- Secondary Education
- Bilingual/ESL
- Foundations
- Reading and Writing

Early Childhood Education and Early Childhood Special Education, options include:

- Infant Specialization
- Family Specialization

Educational Administration, Supervision, and Curriculum Development

Emphasis possible in Educational Technology, options include:

- Corporate Instructional Training and Development
- Instructional Computing
- Instructional Technologist
- Master Resource Teacher
- Higher Education
- Educational Media Specialist

Educational Psychology, options include:

- Child Growth and Development
- Human Learning
- Research and Evaluation Methodology
- School Psychology

Special Education

Teacher 1: mild/moderate needs
Teacher 2: Affective or Cognitive: severe needs

**Ed.S.** (Specialist in Education)

Educational Administration, Curriculum and Supervision

Emphasis possible in Educational Technology

**Ph.D.**

Educational Administration, Curriculum and Supervision

Emphasis possible in Educational Technology

Outlines of each graduate program are listed in the following pages of the School of Education section. Since many of the graduate degree plans are flexible and can be designed around individual student needs, it is highly desirable that the prospective candidate discuss tentative programs of study with appropriate faculty members prior to submitting applications.
Degree Requirements

Two Master of Arts degree plans are available, each comprising one academic year or more of graduate work beyond the bachelor's degree.

1. M.A. — Plan I (With Thesis). The program consists of 36 semester hours or more, including 4 semester hours for the master's thesis. While the inclusion of a minor field is not required by The Graduate School, a student and adviser may agree on a minor, in which 4 to 8 semester hours can be applied toward degree requirements.

The M.A. thesis is written in accordance with the specifications set by The Graduate School and under the supervision of the student's adviser.

2. M.A. — Plan II (Without Thesis). The Plan II program includes 36 or more semester hours of graduate credit, and may include 4 to 10 hours for a minor. The minor is highly recommended in some fields of study.

Comprehensive Examinations

The advisor and student will decide upon one of the following alternatives in the semester before the comprehensive examination is scheduled. Any option taken will require that at least one professor other than the adviser will sign off on the Comprehensive Examination Report that goes to The Graduate School. Identification of this "second reader" should be made at the same time the option is chosen so that the "second reader" can be a part of the planning for the examination.

1. Written Examination. The advisor arranges test questions for the student to write in a four-hour examination. This treatment varies among advisors: some advisors work out questions in advance with the student — other advisors will select final questions for the examination from among those discussed with students. In other cases, the advisor may select questions for the examination and present them to the student at the time of the examination.

2. Take-Home Examination. This option allows the advisor to construct questions with or without input from the student. The student completes the examination at home and turns in the finished product on or before the day of the scheduled comprehensive examination.

3. Oral Examination. This option requires dialogue between students and at least three of their professors over the course work taken in the master's degree program.

4. Written/Oral Combination Examination. This option combines any of the written options noted above and a shortened oral examination during which a committee may ask for clarification of or elaboration on the written examination.

5. Master's Report. This option allows the student to write a synthesizing paper of considerable length (20-30 pages). The project might elaborate on a curriculum plan to be implemented, describe an in-service project, be in the form of a grant proposal or a pilot/feasibility study for future work, or propose an action research project. While practical in nature, the project should demonstrate sufficient theoretical underpinnings to indicate mastery of knowledge assumed for a candidate for a master's degree.

6. Field Study Project. The student develops and implements a field study and prepares a project report.

Transfer Credit

Credit earned before formal admission is transfer credit. Nine master's level transfer hours may be counted toward the M.A. degree. (Transfer credit and non-credit degree may total only 9 hours.)

TEACHER EDUCATION PROGRAMS

Associate Dean for Curriculum and Instruction: Marc Mahlios
Director of Clinical Education: Marilyn Scamman
Office: NC 4001
Telephone: 556-4387

The Teacher Education Program at the University of Colorado at Denver is a graduate program. Prospective students must have a baccalaureate degree or at least 90 credit hours in the College of Liberal Arts and Sciences to apply for admission.

Orientation Sessions

Students who are interested in applying for teacher certification at CU-Denver must attend an orientation session. Orientations are held twice weekly (when the University is in session) and are designed to provide basic information and answer questions regarding University requirements and Colorado law pertaining to teacher certification.

Prospective students are asked to phone the School of Education, Student Services Office, 556-4386(7) for current information regarding orientations (time and location).

It is recommended that students bring transcripts to this session.

Individual Advising

After attending an orientation, prospective students may schedule an appointment with an adviser or attend one of the advising workshops scheduled each Monday. Students must bring transcripts and completed advising sheets to this session. Appointments may be made through the School of Education, 556-4387.

Students accepted to the Teacher Education Program must have a signed advising sheet before beginning the Teacher Education Program. This indicates that a planned program is being followed.

Undergraduates — College of Liberal Arts and Sciences

Undergraduate students, with at least 90 credit hours in the College of Liberal Arts and Sciences, may apply for admission to the School of Education. Candidates who meet all admission requirements are accepted to the Teacher Education Program, may take up to fifteen (15) credit hours of education course work as an undergraduate. If students still have elective credit hours to fulfill, these 15 credits may be applied to their undergraduate program.

Undergraduate students must attend an orientation session. This is suggested by the beginning of an undergraduate's junior year. (Understanding program requirements will assist students in planning for teaching field course work.) Before beginning the Teacher Education Program, undergraduate students must have a signed advising sheet, indicating that a planned program is being followed.

Because the teacher certification program is a graduate program, no more than 15 credit hours, offered through the School of Education, may be taken as an undergraduate. Any remaining credits, required for certification, or for a master's degree, must be taken as a graduate student.

Non-Degree Students

PLEASE NOTE THAT A PROSPECTIVE ELEMENTARY OR SECONDARY TEACHER MAY TAKE ONLY ONE SEMESTER OF EDUCATION COURSES AS A NON-DEGREE STUDENT.

Most education courses in the professional sequence are restricted to students who have met all entrance requirements and have been accepted to the Teacher Education (certification) Program.
Currently, however, students may take one semester (up to 10 semester hours) as a non-degree student, prior to being formally admitted to the certification program. There are specific courses which may be taken as a non-degree student. These are:

FNDS. 5000. Teaching as a Profession
SPED. 5000. Education of the Exceptional Child
MATH. 3040. Math for Elementary Teachers (elementary students only)
RDG. 5020. Reading and Writing Strategies (secondary students only)

A student may take one or three of the above courses; however, prospective certification students may take only one semester as a non-degree student.

Individuals who feel they have a legitimate reason to take restricted preprofessional courses (e.g., the course is required for admission to a master's degree program) should contact the Student Services Office (NC 4001). There is a form which must be completed and approved which permits a student to register for restricted courses.

Out-Of-State Teachers

Individuals who have a teaching license from another state and are seeking certification in Colorado should apply for licensure directly with the Colorado Teacher Education and Certification Office, 201 East Colfax Avenue, Denver, CO 80203 (886-6623). The State Department Certification Office will evaluate transcripts, experience, etc., to determine if a candidate is eligible for certification in Colorado.

This is a necessary first step which should be taken before contacting the university regarding course work. However, out-of-state candidates will need to have six semesters of current course work to be certifiable in Colorado. Current course work is interpreted as courses taken within the past five years. Out-of-state candidates who need such course work should not apply to the School of Education unless seeking an advanced degree. Courses required for Colorado certification are usually taken as a non-degree student.

Non-degree student applications are available from the Office of Admissions, University of Colorado at Denver, Campus Box 167, 1200 Larimer Street, Denver, CO 80204, phone 556-2660. When completed, non-degree student applications should be returned to the Admissions office.

Re-certification Candidates

Teachers, already licensed in Colorado, who are seeking to renew their certification, are required to have six current credit hours taken within the past five years.

Teachers seeking re-certification credit need not apply to the School of Education. Course work may be taken as a non-degree student. Non-degree Student Applications are available directly from the Office of Admissions, University of Colorado at Denver, Campus Box 167, 1200 Larimer Street, Denver, CO 80204, and should be returned there when completed.

Requirements for Admission to the Teacher Certification Program

ADMISSION DEADLINES
May 1 - Fall Semester
October 1 - Spring Semester
March 1 - Summer Term

In addition to the application and $30 fee, the following requirements must be met, and appropriate documentation submitted by the above deadlines, before an application is eligible for faculty review:

1. Evidence of a baccalaureate degree or at least 90 semester hours completed in the CU-Denver College of Liberal Arts and Sciences.
2. A brief handwritten autobiographical sketch (2-3 pages).
3. Two official transcripts from each college or university attended. Official transcripts should be sent directly to:
   University of Colorado at Denver
   School of Education
   Campus Box 106
   1200 Larimer St.
   Denver, CO 80204-5300

   Please note that transcripts may not be hand-carried to the School of Education. They must be mailed directly from each college or university attended to the School of Education.
4. Evidence of at least 30 (clock) hours of successful work with (school age) children/youth. Documentation must be on official letterhead indicating the amount of time involved, and the kind and quality of work.
5. Evidence of passing all sections of the Colorado teacher competency tests (language, spelling, and mathematics sections of the California Achievement Test). These tests must be passed at the 75th percentile or higher. Arrangements for this exam may be made by visiting the CU-Denver Testing Center, NC 2006, 556-2681.

6. Documentation of passing the oral proficiency test or of a college level speech course with at least a B- grade. (The course must involve writing and delivering speeches.)
7. Documentation of academic competence. The CU-Denver Teacher Education Program requires a 2.75 cumulative GPA. Secondary candidates also must have a 2.75 GPA in their teaching field (science, math, etc.). Teaching field or education courses with grades below C- will not count toward certification requirements.

Note: Students with GPA's slightly below the required 2.75 may take teaching field course work, or unrestricted education classes as a non-degree student.

When a 2.75 GPA is achieved (overall and in the teaching field) a student may then apply for admission to the School of Education — Teacher Education Program.

8. Beginning with those seeking admission for Fall 1990, candidates will be required to successfully complete an interview and writing sample. Interview/writing sessions will be scheduled after the May 1 deadline for fall admissions.

9. Second endorsement candidates must be certified to teach in Colorado. A copy of a candidate's teaching certificate is required for admission as a second endorsement candidate.

Foreign Language Certification

Foreign language certification at CU-Denver is a program jointly offered by the School of Education and the Department of Modern Languages (College of Liberal Arts and Sciences).

Candidates interested in certification in French, German, or Spanish must pass written and oral proficiency tests administered by the Department of Modern Languages. (Students with a foreign language major from CU as well as from other institutions must pass these tests in order to be certified.)

Students who have completed a foreign language major should attempt the proficiency exams prior to or during the first semester in the certification program. If a student is unable to pass the tests, this will allow time for additional course work or other experiences before retesting.

Students who have passed the proficiency tests at another institution may need to retake the tests if more than five years have lapsed.

While students are encouraged to take the proficiency tests during their first semester in the certification program, the tests must be passed the semester before applying to student teach.
Students who are seeking foreign language certification must have a major (or equivalent) as determined by the faculty of the Department of Modern Languages. Native speaking ability does not constitute the equivalency of a major.

Students should counsel with a faculty member in the Department of Modern Languages before or during their first semester in the professional sequence to determine if additional course work is necessary — either to develop a major or to prepare for the competency tests.

Students seeking foreign language certification have two advisors. The advisor from the Department of Modern Languages assists students in planning for teaching field course work and preparing for the competency tests. The advisor from the School of Education helps with planning education course work.

Student Teaching

Student teaching is generally the last course taken in the professional sequence. Students will need to plan for the financial resources and time required before making application to student teach (at least 12 weeks, full time).

Students applying for student teaching must have completed all course work in the professional sequence (education) and in their teaching field. Methods course work and all field experience course work must be completed with at least B grades. Students also must have a positive recommendation from their cooperating teacher in microteaching in order to student teach.

No course work may be taken during the semester of student teaching without the advisor’s written permission as noted on the student’s advising sheet.

Student teaching assignments are not available in the summer except for a very limited number of second endorsement candidates. Student teaching application deadlines are:

- Fall: February 15
- Spring: September 15
- Summer: October 1 (Elementary second endorsements only)

All prospective student teachers must meet with the Director of Clinical Education and submit a completed student teaching application prior to the dates listed above. Appointments must be scheduled at least a month prior to the above deadlines.

Faculty Review

Students admitted to the Teacher Education Program are carefully monitored by School of Education faculty throughout their program. Students must maintain at least a 3.00 GPA and must earn at least B grades in all field experience and methods course work.

Beyond grades and GPA requirements, the faculty members are also concerned with students’ professional attitudes and conduct, communication skills, and other behaviors critical to the teaching profession.

Students are evaluated throughout the program for positive personal and professional behaviors. The above review processes are based on the assumption that there are multiple criteria for admission/retenion of students in the Teacher Education Program.

Assumed as well is that all School of Education professors and cooperating teachers, who supervise field experience students, have a responsibility for the overall quality of the teachers that CU-Denver recommends for certification.

ELEMENTARY EDUCATION TEACHER CERTIFICATION

The faculty of the School of Education at CU-Denver advocates that the most appropriate education for an elementary teacher is based upon a liberal arts tradition. The teacher in the elementary school is a generalist and must be aware of the basic structure of a wide variety of disciplines.

Students with a baccalaureate degree who seek elementary certification must have a liberal arts undergraduate major or equivalent in the humanities, social sciences, or natural/physical sciences.

Approximately half the course work (18 semester hours) required for elementary certification may be applied to a master’s degree in curriculum and instruction, provided the student has been accepted to the master’s program.

The Graduate School will accept only 9 semester hours of course work, taken before admission to the master’s program. Thus, students in the certification program who apply to the master’s program during their first semester, provided they wish to pursue a master’s degree.

Professional Sequence for Elementary Certification

COURSES

FNDS. 5000-3. Teaching as a Profession (Foundations of American Education). A general foundations course for pre-service candidates. Provides a broad overview of the historical, sociological, philosophical, and legal foundations of education. Includes an examination of contemporary issues in schooling, school organization, and the professional rights and responsibilities of the teacher. (Does not apply for master’s credit.)

TED. 5750-2. Exploring Education. Examines a broad range of teaching methods and classroom management strategies. Participants share experiences and compare/contrast the different levels of instruction observed (elementary, middle school, and high school). Includes forty (clock) hours of field experience in a school setting. Cannot be waived for prior experience unless second endorsement. (Does not apply for master’s credit.)

EPSY. 5000-3. Psychological Foundations of Education. A survey of results of psychological inquiry with emphasis on applications to educational practices. Major topics are motivation, behavior, learning, development, measurement/testing, and characteristics of teachers and students. Designed for pre-service teachers. (Does not apply for master’s credit.)

MATH. 5040-4. Math for Elementary Teachers. Emphasis on mathematical concepts and hands-on learning. Topics include problem solving, informal geometry, rational numbers, probability measurement, and statistics. (Does not apply for master’s credit.)

Students scoring at the 90th percentile on the math portion of the CAT, who received high grades in high school/college math courses, may substitute MATH. 5804-3, Topics in Mathematics for Teachers, or ELED. 5440, Problem Solving and Geometry in Elementary School. (Both may apply for master’s credit.)

ELED. 5100-3. Integrating the Language Arts with Children’s Literature. Introduces students to methods of teaching the language arts (reading, writing, listening, speaking) through children’s literature. (Does not apply for master’s credit.)

ELED. 5150-6. Elementary Curriculum: Teaching Mathematics, Science, and Social Studies. Introduces students to contemporary curricula and methods. Emphasis on the use of a holistic, integrated approach. Students analyze and develop curriculum lessons/units, teach mini-lessons with peer analysis, and use a small group format for class demonstrations and activities. (Does not apply for master’s credit.)

ELED. 5210-3. Models of Teaching. Emphasis on learning, refining, analyzing, and redesigning various teaching models including inquiry, concept attainment, role playing, and advance organizers. Students are assigned to small groups for purposes of planning and teaching lessons designed around various models under examination. (May apply for master’s credit.)

SPED. 5000-3. Education of the Exceptional Child. Introduction to all the major categories of exceptionality. Emphasis is on historical perspectives, legal aspects, definitions of handicapping conditions, major theoretical viewpoints, and service delivery
models. (May apply for master's credit.)

Note: SPED. 5010-3. Teaching Strategies for Students with Special Needs, may be substituted by students who already have basic knowledge of material covered in SPED. 5000. (May apply for master's credit.)

ELED. 5170-3. Community and Interpersonal Relations. Provides an opportunity for prospective teachers to develop communication and interpersonal skills that will enable them to facilitate positive student self-concept and interaction among professional educators, the community, and social groups. Exposes students to urban environment. Includes discussion of child abuse and its recognition. (May apply for master's credit.)

IT. 5180-3. Instructional Technology for Teachers. Introduces students to the basics of selecting, producing, evaluating, and utilizing instructional media/technology, including microcomputers and television, in the instructional process. (May apply for master's credit.)

RDG. 5000-3. Effective Reading and Writing Instruction. Critically examines current basal reader programs and uses and assists students in the development of an effective basal reader program from a whole language perspective. Thematic units are briefly considered as a means of integrating reading, writing, and elementary content areas. (May apply for master's credit.)

ELED. 5160-3. Expressive Arts. Course serves a 3-fold purpose. First it familiarizes participants both theoretically and experientially with the expressive arts of drama, music, dance and movement (PE, dance, and health), and visual arts. Secondly, the course explores the underlying rationale for the inclusion of arts in the elementary curriculum, especially the role of the arts in fostering cognitive development, creative problem solving, and interpersonal cooperation and communication. Finally, the course suggests ways in which the arts can be integrated into classroom activities with the aim of viewing the act of teaching itself as an expressive art. (May apply for master's credit.)

TED. 5130-3. Microteaching. A clinical practicum course designed to prepare students for student teaching. A major emphasis of the course involves lesson planning, delivery, and evaluation. Other areas of emphasis include classroom management and professional ethics/conduct/responsibility. Course involves 60 (clock) hours in a school setting. During this field placement two lessons are videotaped and critiqued by the course instructor, the cooperating teacher, and the student. Feedback conferences are provided to analyze strengths and provide suggestions for growth. A positive cooperating teacher evaluation of the student's classroom work is required before a student teaching placement will be arranged. Cannot be waived for prior experience unless the student is a second endorsement candidate. Prer., successful completion of TED. 5750. (Does not apply for master's credit.)

TED. 5700-8. Student Teaching. Course involves a minimum of 12 weeks (full time) in a public school setting. Four evening seminars also are required. (Does not apply for master's credit.)

Note: Second endorsement candidates with recent teaching experience at the appropriate level may substitute ELED. 5190-4 Advanced Practicum.

SECONDARY EDUCATION TEACHER CERTIFICATION

Students interested in obtaining teacher certification at the secondary level must have:
1. A baccalaureate degree from an accredited institution of higher education.
2. A major or equivalent in the discipline of endorsement.
3. Additional courses as prescribed by the University to meet state certification standards, NCATE standards, and North Central accreditation standards.

Approximately half the course work required for secondary teacher certification may be applied to a master's degree in curriculum and instruction, provided the student has been accepted to the master's degree program.

The Graduate School will accept only 9 semester hours of course work, taken before admission. Therefore, students in the certification program who are interested in pursuing a master's degree should apply to the master's program during their first semester.

Professional Sequence for Secondary Certification

COURSES

FDNS. 5000-3. Teaching as a Profession (Foundations of American Education). A general foundations course for pre-service candidates. Provides a broad overview of the historical, sociological, philosophical, and legal foundations of education. Includes an examination of contemporary issues in schooling, schooling organizational patterns, and the professional rights and responsibilities of the teacher. (Does not apply for master's credit.)

TED. 5750-2. Exploring Education. Examines the broad range of teaching methods and classroom management strategies. Participants share experiences and compare/contrast the different levels of instruction observed (elementary, middle school, and high school). Includes forty (clock) hours of field experience in a school setting. Cannot be waived for prior experience unless second endorsement. (Does not apply for master's credit.)

EPSY. 5000-3. Psychological Foundations of Education. A survey of results of psychological inquiry with emphasis on applications to educational practices. Major topics are motivation, behavior, learning, development, measurement/testing, and characteristics of teachers and students. Designed for pre-service teachers. (Does not apply for master's credit.)

SPED. 5000-3. Education of the Exceptional Child. Introduction to all the major categories of exceptionality. Emphasis is on historical perspectives, legal aspects, definitions of handicapping conditions, major theoretical viewpoints, and service delivery models. (May apply for master's credit.)

Note: SPED. 5010-3. Teaching Strategies for Students with Special Needs, may be substituted by students who already have basic knowledge of material covered in SPED. 5000. (May apply for master's credit.)

SECE. 5170-3. Community and Interpersonal Relations. Provides an opportunity for pre-service teachers to develop communication and interpersonal skills that will enable them to facilitate positive student self-concept and interaction among professional educators, the community, and social groups. Exposes students to urban environment. (May apply for master's credit.)

Note: SPED. 5010-3. Teaching Strategies for Students with Special Needs, may be substituted by students who already have basic knowledge of material covered in SPED. 5000. (May apply for master's credit.)

IT. 5180-3. Instructional Technology for Teachers. Introduces students to the basics of selecting, producing, evaluating, and utilizing instructional media/technology, including microcomputers and television, in the instructional process. (May apply for master's credit.)

RDG. 5000-3. Effective Reading and Writing Instruction. Critically examines current basal reader programs and uses and assists students in the development of an effective basal reader program from a whole language perspective. Thematic units are briefly considered as a means of integrating reading, writing, and elementary content areas. (May apply for master's credit.)

ELED. 5160-3. Expressive Arts. Course serves a 3-fold purpose. First it familiarizes participants both theoretically and experientially with the expressive arts of drama, music, dance and movement (PE, dance, and health), and visual arts. Secondly, the course explores the underlying rationale for the inclusion of arts in the elementary curriculum, especially the role of the arts in fostering cognitive development, creative problem solving, and interpersonal cooperation and communication. Finally, the course suggests ways in which the arts can be integrated into classroom activities with the aim of viewing the act of teaching itself as an expressive art. (May apply for master's credit.)

TED. 5130-3. Microteaching. A clinical practicum course designed to prepare students for student teaching. A major emphasis of the course involves lesson planning, delivery, and evaluation. Other areas of emphasis include classroom management and professional ethics/conduct/responsibility. Course involves 60 (clock) hours in a school setting. During this field placement two lessons are videotaped and critiqued by the course instructor, the cooperating teacher, and the student. Feedback conferences are provided to analyze strengths and provide suggestions for growth. A positive cooperating teacher evaluation of the student's classroom work is required before a student teaching placement will be arranged. Cannot be waived for prior experience unless the student is a second endorsement candidate. Prer., successful completion of TED. 5750. (Does not apply for master's credit.)

SECE. 5460-3. Theory and Practice of Teaching Social Studies. Examines recent developments in theory and materials in the social sciences and analyzes present practices for their contribution to general goals of social studies education. (May apply for master's credit.)
SECE. 5250-3. Theory and Practice in Teaching English. Examines curriculum, materials, methods, evaluation, and related aspects of instruction. This course is designed to integrate content and methodology. (May apply for master's credit.)

SECE. 5350-3. Issues and Problems in Science Education. Recent developments in theory, curriculum, methods, and materials in secondary science, examined for their contribution to the objectives of science education. (May apply for master's credit.)

TED. 5300-3. Introductory Curriculum and Methods in Secondary Mathematics. Course is designed for pre-service secondary math teachers. Topics include: history of math curriculum; survey of current methodology; unit and lesson planning; and grading, diagnosis, and remediation for concepts and skills. Emphasis on demonstration lessons, practical applications. (Does not apply for master's credit.)

French / German / Spanish 4960-3. Methods of Teaching Modern Languages. Methodology of teaching French, German, and Spanish. Examines the theories and practices of teaching modern languages. Course is offered Spring Semester, either by CU-Denver Department of Modern Languages or by Metro State College. (Does not apply for master's credit.)

TED. 5130-3. Microteaching. A clinical practicum course designed to prepare students for student teaching. A major emphasis of the course involves lesson planning, delivery, and evaluation. Other areas of emphasis include classroom management and professional ethics/conduct/responsibility. Course involves 60 (clock) hours in a school setting. During this field placement two lessons are videotaped and critiqued by the course instructor, the cooperating teacher, and the student. Feedback conferences are provided to analyze strengths and provide suggestions for growth. A positive cooperating teacher evaluation of the student's classroom work is required before a student teaching placement will be arranged. Cannot be waived for prior experience unless the student is a second endorsement candidate. Prer. successful completion of TED. 5750. (Does not apply for master's credit.)

TED. 5700-8. Student Teaching. Involves a minimum of 12 weeks (full time) in a public school setting. Four evening seminars also are required. (Does not apply for a master's degree.)

Note: Second endorsement candidates with recent teaching experience at the appropriate level may substitute ELED. 5190-4. Advanced Practicum (with permission).

Programs of Study

COUNSELING AND PERSONNEL SERVICES

Division Coordinator: Robert L. Smith
Office: NC 4028
Telephone: 556-8367
Faculty: Professors: John O. Crites, Robert L. Smith
Associate Professors: Andrew A. Helwig, William A. Sease
Assistant Professors: Barbara Bebencee, Luann Costa, Joseph Lasky, Connie Schliebner, Walter L. Strangburg

The Master of Arts degree through the Counseling and Personnel Services Division prepares professionals for community/mental health agencies, public schools, universities, private practice, and business and industry. Candidates seeking certification for school counseling (K-12) as a credential within the master's degree must satisfy state requirements. All students should obtain faculty advising relevant to requirements.

All programs consist of 48 semester hours (with the exception of the Marriage and Family Therapy program which is 60 hours) and include core requirements, major field sequence, and added electives. Within the 48 hour program is the practicum (100 clock hours) and internship (600 clock hours). The master's degree is a two-year program.

Program Areas

Students follow one of five program tracks offered in Counseling and Personnel Services. In addition to the program area course work, a minimum of 12 hours of foundation level course work in other School of Education divisions is required of graduate degree students in Areas One, Two, and Four. Program Area Three, Counseling and Human Resource Development, is an interdisciplinary track and requires additional course work outside Counseling and Personnel Services. The Marriage and Family Therapy program is 60 hours and follows licensure requirements.

CORE CURRICULUM REQUIREMENTS FOR PROGRAM AREAS ONE, TWO, AND FOUR (12 HOURS)

REM. 5200-3. Introduction to Research Methods
REM. 5300-3. Introduction to Measurement

LC. 5040-3. Multicultural Education
CPS. 5831-3. Strategies in Multicultural Counseling
EPSY. 6200-3. Human Development Over the Lifespan

PROGRAM AREA ONE: PUBLIC SCHOOL COUNSELING CERTIFICATE (M.A.)

CPS. 5010-3. Foundations of Guidance, Counseling, and Personnel Services
CPS. 5020-3. Personal Appraisal
CPS. 5100-3. Theory and Techniques of Counseling
CPS. 5110-3. Group Counseling
CPS. 5330-3. Professional Seminar in Counseling
CPS. 5400-3. Career Development
CPS. 5420-3. Organization Development
CPS. 5800-3. Strategies in Public School Counseling
CPS. 5910-3. Practicum
CPS. 5930-6. Internship
Electives

PROGRAM AREA TWO: COMMUNITY/AGENCY COUNSELING (M.A.)

CPS. 5010-3. Foundations of Guidance, Counseling, and Personnel Services
CPS. 5020-3. Personal Appraisal
CPS. 5100-3. Theory and Techniques of Counseling
CPS. 5110-3. Group Counseling
CPS. 5150-3. Marital and Family Counseling
CPS. 5280-3. Substance Abuse Counseling
CPS. 5330-3. Professional Seminar in Counseling
CPS. 5400-3. Career Development
CPS. 5820-3. Strategies in Agency Counseling
CPS. 5910-3. Practicum
CPS. 5930-6. Internship
Electives

PROGRAM AREA THREE: COUNSELING AND HUMAN RESOURCE DEVELOPMENT (M.A.)

CPS. 5010-3. Foundations of Guidance, Counseling, and Personnel Services
CPS. 5020-3. Personal Appraisal
CPS. 5100-3. Theory and Techniques of Counseling

' A teaching certificate (valid in Colorado) and two years of teaching experience are required for the Public School Counseling Certificate. Type E certification is available for professionals able to substitute related experiences for the teaching requirement.
CPS 5150-3. Marital and Family Counseling
CPS 5240-3. Counseling and Human Resource Development
CPS 5280-3. Substance Abuse Counseling
CPS 5330-3. Professional Seminar in Counseling
CPS 5400-3. Career Development
CPS 5910-3. Practicum
CPS 5930-6. Internship
CPS 6240-3. Consultation Strategies

Outside course work (12 hours minimum) IS REQUIRED IN areas such as Instructional Technology and Education Administration, with a minimum of two courses in business.

PROGRAM AREA FOUR: COLLEGE STUDENT PERSONNEL (M.A.)

CPS 5010-3. Foundations of Guidance, Counseling, and Personnel Services
CPS 5020-3. Personal Appraisal
CPS 5100-3. Theory and Techniques of Counseling
CPS 5110-3. Group Counseling
CPS 5120-3. The Student in Higher Education
CPS 5330-3. Professional Seminar in Counseling
CPS 5400-3. Career Development
CPS 5910-3. Practicum
CPS 5922-3. Readings in Counseling and Personnel Services Development
CPS 5930-6. Internship
Electives

MARRIAGE AND FAMILY THERAPY TRACK — 60 semester hours

The Marriage and Family Therapy Program is a minimum of 60 semester hours. The didactic components include sequenced course work in Systems Theory, Marital and Family Therapy, Advanced Marriage and Family Therapy, Marriage and Family Techniques, and Adult-Child Relationships. The clinical component requires 600 clock hours of client contact including 250 hours with couples and families under supervision.

Access Program in Counseling and Personnel Services

The Counseling and Personnel Services Program has an Access Program for students who wish to complete the degree off-campus. Courses are held at community colleges and other sites in the Denver metropolitan area.

The quality of instruction and individual course requirements for this program are identical to those for the on-campus program. Students should contact their advisor for further information.

COURSES

Note: During the regular academic year the following courses are open to graduate degree students only and to those admitted for the purpose of pursuing professional counselor certification. Special service sections may be offered from time to time and are indicated as open. Non-degree students may be admitted with permission. See the current Schedule of Classes.

CPS 5010-3. Foundations of Guidance, Counseling, and Personnel Services
Examination of the helping profession. Overview of the field. History, philosophy, and introduction to theory. Legal and ethical considerations, special problems, and professional outlook. Role and function of counselors in agency settings and school. To be taken concurrently with CPS 5020.

CPS 5020-3. Personal Appraisal
Personal appraisal taken concurrently with CPS 5010, overview of the field. Emphasizes small group laboratory method and experiential learning designed to foster self-exploration and interpersonal skill development relevant to personal and professional goals. Because of the experiential nature of the course the grading is undifferentiated with pass/fail or B as the expected maximum grade.

CPS 5100-3. Theory and Techniques of Counseling
Comparative examination of counseling theories and approach strategies, including consultation. Experience in counseling and interviewing techniques. Pre-practicum laboratory experiences in counseling lab setting. Prer. CPS 5010, 5020.

CPS 5110-3. Group Counseling

CPS 5120-3. The Student in Higher Education
Overview of college student personnel work. Special problems in college counseling. Group facilitation and values clarification skills. Consulting in higher education.

CPS 5140-3. Systems Theory in Family Therapy
Provides understanding of major models of systems change and cybernetics in family therapy. Addresses principles and techniques of major models.

CPS 5150-3. Marital and Family Therapy
Marital and family conflicts and counseling intervention strategies. Emphasis on systems theories.

CPS 5160-3. Advanced Marital and Family Therapy

CPS 5240-3. Counseling and Human Resource Development
A didactic and experiential course dealing with the application of counseling and human resource development skills within the business setting. Employee Assistance Programs are emphasized. Basic HRD terminology, training techniques, and counseling/training needs are introduced. Prer., CPS 5010, 5020, or consent of instructor.

CPS 5280-3. Substance Abuse Counseling
This course covers federal confidentiality regulations, state laws, driving counter measure programs, drug and alcohol pharmacology, client-record management. Etiology of substance abuse, diagnosis, and basic treatment models are examined. Prer. CPS 5010 and 5020, or consent of instructor.

CPS 5330-3. Professional Seminar in Counseling
An in-depth examination of special problems and topics in the field. Emphasis is on ethics, legal issues, licensure, professional associations, and individual project investigations. Prer. CPS 5010 and 5020.

CPS 5400-3. Career Development
Development of competencies in career development counseling. Theories, information systems, decision making systems, awareness of self, and the world of educational and work opportunities. Prer. CPS 5010, 5020, or consent of instructor.

CPS 5420-3. Organizational Development
Organizational development and theory. The development and implementation of counseling and guidance programs in public school settings, program development, implementation, consultation and evaluation. Individual projects required for course completion. Prer. CPS 5010, 5020, or consent of instructor.

CPS 5800-3. Strategies in Public School Counseling
Role and function of the public school counselor. Utilization of consultation skills and group process in relation to guidance objectives. Strategies used with at risk, suicide, dropout, culturally different, and gifted students are emphasized. Prer. CPS 5010, 5020, or consent of instructor.

CPS 5820-3. Strategies in Agency Counseling
Role and function of the counselor in agency settings. Group work, intervention strategies, consultation, use of DSMIIIR, etc., with agency clientele. Exploration of community resources.

CPS 5824-3. Counseling Strategies and Approaches
Individualized directed investigation of trends and contemporary problems and issues in the field. Oriented to the field practitioner and special needs of differential work settings. (Open.)

CPS 5830/5834-1 to 4. Special Topics in Counseling and Personnel Services
Specific topics vary from semester to semester. Intervention strategies with children; issues in abuse, violence, incest, legal issues, adult counseling, grief, death, and dying.

CPS 5910-3. Practicum
Supervised counseling practice in the counseling lab and
appropriate settings. (100 clock hours.) Emphasis on individual and group counseling techniques and therapeutic intervention strategies. Prer., CPS. 5010, 5020, 5100 or consent of instructor.

CPS. 5822-3. Readings in Counseling and Personnel Services Development. Focus on special problems in development and delivery of personnel services. Directed readings and small group activities.

CPS. 5930-6. Internship in Counseling. Supervised off-campus internship in counseling. By advance application and arrangement. Setting is based upon the track for which one is being prepared. Application should be made during the preceding semester. Materials and instructions for the internship are obtained from the division or the Book Center. Prer., all required CPS courses. Section subtitles indicate agency/community, school, business placement. The internship includes 600 hours on site with supervision.

CPS. 6120-3. Computer Applications in Counseling and Assessment. Introduction to the various uses of computer technology in guidance, counseling, and assessment activities. Underlying theoretical concepts and a variety of software programs will be reviewed. Prer., graduate status.

CPS. 6140-3. Adult-Child Relationships in Family Therapy. A didactic and experiential course dealing with therapeutic techniques applied to the improvement of adult-child relationships.


CPS. 6240-3. Consultation Strategies. This course focuses on the development of consultation skills and implementation of strategies. The student is exposed to major theories of the consultation process. In addition the course provides students with the opportunity to practice consultation and implementation strategies within a systemic agency, business setting, or educational setting. Prer. CPS. 5010 and 5020, or consent of instructor.


CPS. 7280-3 Intervention and Treatment in Substance Abuse. This course examines in-depth chemical dependency, and the diagnosis and treatment of co-dependents. Treatment modalities are emphasized including follow-up and research. Prer. CPS. 5010, 5020, and 5280, or consent of instructor.


Independent Study

CPS. 5840-1 to 4. Independent Study. Individually directed research activity on special topics not covered by course offerings. Degree students only, with advance approval by major professor and department.

Student Systematic Review and Personal Development

Due to the nature of the work of the professional counselor, progress by students is periodically reviewed throughout the program providing the opportunity for faculty feedback and student feedback. The monitoring system examines the personal and professional status of the trainees' potential in the helping profession. This is completed when students are enrolled in CPS. 5020 and CPS. 5100. Practicum and Internship. In addition, students are encouraged to use the University Counseling Services and outside agencies to further their personal development.

Licensure

The community/agency and the marriage and family therapy programs parallel course work required for licensed professionals in the state of Colorado. The practicum and internship requirements equal or exceed licensure requirements.

CURRICULUM AND INSTRUCTION

Division Coordinator: Marc C. Mahlios
Office: NC, Fourth Floor
Telephone: 556-4387
Faculty: Professors: Norma J. Livo, Glenn E. McGlathery, Marie Wirsing
Associate Professors: Mark Clarke, William A. Jurashek, Milton Kleg, Marc C. Mahlios, Lynn Rhodes
Assistant Professors: Nancy Commins, Sheila M. Shannon

The Division of Curriculum and Instruction offers the M.A. degree and has five areas of emphasis in which students may focus their studies. These include Elementary Education, Secondary Education, Bilingual Education/English as a Second Language (ESL), Foundations, and Reading and Writing.

1. Master of Arts (M.A.), Plan I, requiring a minimum of 36 semester hours including 4 hours for a thesis and 4 to 8 semester hours in a minor field.

2. Master of Arts (M.A.), Plan II, requiring a minimum of 36 semester hours with or without a minor (most popular plan).

Bilingual Education/English as a Second Language

Program Area Coordinator: Mark A. Clarke
Office: NC, Fourth Floor
Telephone: 556-4366
Faculty: Associate Professor: Mark A. Clarke
Assistant Professors: Nancy L. Commins, Sheila M. Shannon

The area offers a 36-unit program leading to an M.A. in curriculum and instruction, elementary or secondary education with an emphasis in bilingual education or English as a second language (ESL).

The program provides a theoretical and practical foundation for individuals interested in teaching in bilingual education or ESL programs in the U.S. or abroad, with course work in language teaching methodology, language acquisition, applied linguistics, cross-cultural education, curriculum development, and other areas.

Each student develops an approved program in consultation with an advisor, which consists of 36 hours of course work (in education, linguistics, sociopolitical foundations, and classroom applications), a field experience, and a final project.

Course Work

Course work is required in four areas:

1. School of Education Core Courses (9 hours minimum)
2. Linguistics (6 hours minimum)
3. Sociopolitical Foundations (6 hours minimum)
4. Classroom Applications (12 hours minimum)
CORE COURSES (9 HOURS MINIMUM)

LC. 5040-3. Multicultural Education
LC. 5105-3. Culture of the Classroom
EPSY. 5020-3. Advanced Psychological Foundations of Education
REM. 5000-3. Orientation to Research, Evaluation and Measurement
REM. 5200-3. Introduction to Research Methods
FNDS. 5050-3. Critical Issues in American Education
FNDS. 5500-3. Contemporary Philosophies of Education

LINGUISTICS (6 HOURS MINIMUM)

LC. 5070-3. Linguistic Analysis of English: Implications for Teaching
LC. 5110-3. Second Language Acquisition
LC. 5810-3. Workshop in Language Acquisition and Development
LC. 5800-3. Sociolinguistics: Language Variations and its Implications for Teachers

SOCIOPOLITICAL FOUNDATIONS (6 HOURS MINIMUM)

LC. 5030-3. Issues of Language in Education
LC. 5080-3. Community and Interpersonal Relations
LC. 5410-3. Literacy
LC. 5060-3. Seminar: Bilingual Multicultural Education
LC. 5250-3. Seminar: Teaching English as a Second Language

CLASSROOM APPLICATIONS (12 HOURS MINIMUM)

LC. 5010-3. Materials and Curriculum Development
LC. 5050-3. Linguistic and Cultural Issues in Testing and Assessment
LC. 5100-3. Theories and Methods of Second Language Teaching
LC. 5820-1 to 3. Techniques in Teaching English as a Second Language
LC. 5840-3. Teaching Reading and Writing in Second Languages

FIELD EXPERIENCE (3 HOURS MINIMUM)

The M.A. program has been developed as an advanced course of study for practicing teachers or individuals with some teaching experience, whether in BE/ESL or in other areas. All candidates are required to complete a field experience which is designed to reflect their individual needs, talents, and areas of interest. A plan is developed with input from the students advisor. All experiences are supervised by Dr. Nancy L. Commins, Coordinator of Field Experiences. Students must register for LC. 5930 Field Experience. In this course students have the opportunity to meet with others to discuss their experiences and provide mutual feedback and encouragement.

FINAL PROJECT

The final project is designed to be the culminating experience of the M.A. program, one which permits students to integrate their course work and other experiences into a focused examination of important professional issues. Two options are available:

PLAN I. Thirty-six hours plus thesis. The thesis option requires 4 hours of thesis credit in the semester in which the candidate finishes the thesis. Students interested in following this option should begin to identify potential topics and research questions about mid-way in their program.

PLAN II. Thirty-six hours plus comprehensive examination. This plan contains two options:
   a. A two-hour examination coupled with a research paper or take-home examination. Potential areas to be covered include all course work. Preliminary topics and sample questions are negotiated between the candidate and the advisor.
   b. Masters Paper. A scholarly paper of sufficient quality to be submitted to a professional journal. This option includes an oral defense of the paper.

COLORADO ENDORSEMENT FOR TEACHERS OF THE LINGUISTICALLY DIFFERENT

The language and culture program area offers course work and supervised field experiences which satisfy standards established by the Colorado Department of Education for the endorsement to teach limited English proficient children.

This program has been designed for individuals who have a strong academic background, possess a valid Colorado teaching certificate, and are committed to quality education for culturally and linguistically different students. A minimum of 21 semester hours of course work is required, including appropriate field experiences.

Individuals applying for the bilingual education emphasis must be proficient in Spanish.

Following are the Colorado standards for the Linguistically Different Endorse-ment, with appropriate course work listed under each standard. These classes are cited as examples; each individual works with an advisor to develop an approved program.

Course Work

Linguistics, Language Acquisition, Language Teaching

LC. 5820-3. Techniques in Teaching English as a Second Language.

Bilingual Competence (Bilingual Education emphasis only)

The teacher must demonstrate competence in a language other than English and take one of the following courses:

LC. 5110-3. Second Language Acquisition
LC. 5800-3. Sociolinguistics: Language Variation and Its Implications for Teachers.

Historical, Philosophical, Legal Foundations

LC. 5030-3. Issues of Language in Education

Structure of English (for ESL emphasis only)

The teacher must demonstrate competence in English and take one of the following courses:

LC. 5110-3. Second Language Acquisition or
LC. 5070-3. Linguistic Analysis of English: Implications for Teaching

Cross Cultural Insight, Knowledge, Sensitivity

LC. 5040-3. Multicultural Education Assessment

LC. 5010-3. Curriculum and Materials Development
LC. 5050-3. Linguistic and Cultural Issues in Testing and Assessment

Community and Human Relations

LC. 5080-3. Community and Interpersonal Relations or
LC. 5930-3. Field Experience in Bilingual and English as a Second Language
courses

lc. 5010-3. Curriculum and Materials Development. Enables students to utilize the knowledge and competencies achieved regarding culture, community life styles, and language in order to develop specific strategies for diagnosing each pupil's performance and developing curriculum.

lc. 5020-3. Issues in Language and Culture. Provides an overview of the issues in language and culture which pertain to the education of language minority students. Topics include the nature of language and culture; historical perspectives on immigration, acculturation, and assimilation; the relationship between the school and the community; the link between bilingual and ESL education; and the assessment of language minority students.

lc. 5030-3. Issues in Language in Education. This course provides students with a critical view of current issues of language in education. Language in education is a broad topic that includes specific areas such as the change of public education to teach English to language minority students, debates over the use of the minority language to achieve that goal or to maintain a language other than English, the convergence and divergence of home and school language, the dichotomy of orality and literacy, and foreign language education. The historical bases from which the present state of affairs have arisen is carefully examined for all issues. In addition to a historical perspective, the current issues are considered from their legal, cultural, political, and philosophical roots in terms of national language policy and pedagogy.

lc. 5040-3. Multicultural Education. This course is a broad view of issues about cultural diversity and schooling. Students learn to detect cultural differences in various social settings and how groups align themselves according to shared features. The interaction of various groups is the focus as well, particularly looking at language, race, social class, gender, and abilities. The overarching theme of the course is education, and therefore provides teachers with approaches to cultural diversity in education that shape sound practice.

lc. 5050-3. Linguistic and Cultural Issues in Testing and Assessment. Provides a general orientation to testing and assessment of students. The course will analyze important linguistic and cultural considerations regarding assessment instruments and procedures. Topics to be studied include the history of testing, types of tests, administration of tests, and interpretation of results, current testing trends and implications for the classroom.

lc. 5060-3. Seminar: Bilingual-Multicultural Education. Provides advanced students with the opportunity to do comprehensive evaluation of current research, issues, and trends relevant to bilingual-multicultural education.

lc. 5070-3. Linguistic Analysis of English: Implications for Teaching. Provides students with a basic understanding of the structure of English and gives them an opportunity to use that understanding to diagnose language problems. Topics include morphology and syntax and the use of contrastive and error analysis in the classroom.

lc. 5080-3. Community and Interpersonal Relations. Focuses on communication and interpersonal and human relations skills; provides participants with group process skills which facilitate positive student self-concept, parent-teacher cooperation, interaction among professional educators, the community, and social groups in a bilingual setting. Includes a field experience which requires students to participate in and observe community life in selected linguistically different communities.

lc. 5090-3. Introduction to Linguistics and Language Learning. Provides students with a basic understanding of language and introduces linguistics as an effective tool for analyzing and solving the language problems of learners, including second-language/dialect speakers. Topics to be covered include nature of language, the structure of English, language variation, language acquisition, language in society, and conversational interaction.

lc. 5100-3. Theories and Methods of Second Language Teaching. Provides an overview of approaches to second language teaching. Emphasis is on development of a personal philosophy of second language teaching. Topics covered include first and second language acquisition, contributions of psychology and linguistics, and current practices and trends in language teaching.

lc. 5110-3. Second Language Acquisition. Provides students with a broad view of the field of second language acquisition. Linguistic, sociological, psychological, anthropological contributions to the theory and practice of second language learning and teaching are examined. Contexts for learning that are considered in this course range from the informal to formal and include preschool, school-age and adult perspectives. One focus is on English as a second language in the U.S. with particular concerns surrounding language minority populations, but also covered in this course are issues concerning English learned abroad or in the U.S. by foreigners. Furthermore, learning second languages other than English is addressed. A major feature of this course is that students are required to work directly with a second language learner in order that knowledge gained can be applied and tested against an actual case.

lc. 5150-3. Culture of the Classroom. This course views cultural diversity in education with a tight focus on the classroom. Students get a microscopic view of life in classrooms and how differences as obvious as race and language and those as subtle as gender and ability are organized and the impact that has on individuals' success.

lc. 5250-3. Seminar: Teaching English as a Second Language. An issues course for experienced teachers or neophytes who have the prerequisite number of preparatory courses, this seminar is intended as a forum for the discussion and analysis of the important research and pedagogical trends in the field. Students will be provided with the opportunity to research and analyze topics of interest to them.

lc. 5410-3. Literacy. Students examine the nature of literacy and the acquisition of literacy-related skills, especially as this means the acquisition of school appropriate language skills. The topic is examined from a descriptive perspective (i.e., merely attempting to understand literacy as a phenomenon of language and language use) and from a prescriptive perspective (i.e., trying to figure out what importance this has for teachers).

lc. 5430-3. Gender as Culture. Examines ways some impact of language and value systems regarding gender are manifest in schools, homes, and work places. Provides students with knowledge and insight from interdisciplinary scholarship of gender in society.

lc. 5800-3. Sociolinguistics: Language Variation and Its Implications for Teachers. Focuses on language change and language variation in a social context with particular emphasis on the implications of sociolinguistics for teachers. Heavy emphasis is placed on understanding how differences in sound systems, language structure, and discourse practice impact classroom practice. Students will examine teaching methods and materials in light of a sociolinguistic analysis of such topics as bilingualism, dialectal variation, etc.

lc. 5810-3. Workshop in Language Acquisition and Development. Provides students with an opportunity to examine current research on language acquisition and development and to apply their knowledge to their own teaching situation. The course focuses on language development and use in educational settings and includes a focus on second-language learners, nonstandard speakers, and bilingual children. Students collect and analyze language samples, evaluate teaching materials, and examine teaching techniques in light of the material covered in the course.

lc. 5820-3. Techniques in Teaching English as a Second Language. Develops skills in using a variety of classroom techniques to teach English as a second language. The course is a practical presentation of ESL methods, techniques, and materials. Examples of classroom practices are taken from the full educational spectrum from public schools to pre-university intensive courses on adult education.

lc. 5830-1 to 4. Workshop in Multicultural Education. Provides students
with experiences in training in multicultural methodology. How to utilize community members, paraprofessionals, and peers to facilitate learning in a multicultural environment.

LC. 5840-3. Teaching Reading and Writing in Second Languages. Focuses on literacy skills for non-English speaking learners. The course is a practical course for teachers who work with limited English speakers. Focus is primarily on development of classroom techniques and materials in a communicative language setting. The full range of literacy skills is covered — from beginning to advanced. Instructional strategies emphasize the integration of reading and writing experiences.

LC. 5920-2 to 4. Reading in Multicultural Education. Provides students with an opportunity to examine the current literature as it relates to trends in contemporary issues in the area of multicultural education.

LC. 5930-3. Field Experience in Bilingual and English as a Second Language. Provides students who have completed a portion of their course work the opportunity to apply some of the theories and methods they have studied to a “real life” application in the community. Experiences are designed to fit individual needs, talents, and areas of interest. Class sessions focus on the development of appropriate expectations as a part of the communication skills students will need as they interact in second language communities and cross-cultural settings. Classes also provide a forum for students to discuss their experiences and spot any problems in communication which may arise in the field. In addition, students must practice their interpersonal skills as they give mutual feedback and encouragement.

LC. 6090-3. Research Seminar. An advanced course which focuses on specific issues in language, language acquisition, and language teaching.

Independent Study

LC. 5840-1 to 4. Independent Study in Bilingual-Multicultural Education. Provides an opportunity for students who have a major in elementary education or secondary education to do an in-depth study of topics not covered in the regular curriculum offerings.

Elementary Education

Two curriculum and instruction master’s degree emphases in elementary education are offered.

Core Courses — 12 Semester Hours

ELED. 5210-3. Models of Teaching and Observation (cross-listed with SECE. 5210).
REM. 5000-3. Orientation to Research and Measurement in Education
Six hours from:
EPSY. 5020-3. Advanced Psychological Foundations of Education
or
EPSY. 5100-3. Advanced Child Growth and Development
LC. 5040-3. Multicultural Education
FNDS. Any foundations course is acceptable except FNDS. 5000

Area Courses — 15 Semester Hours

One course in each of the following areas:

LANGUAGE ARTS
ELED. 5320-3. Advanced Language Arts in the Elementary School

SOCIAL STUDIES

SCIENCE EDUCATION
ELED. 5350-3. Science in the Elementary School

CHILDREN’S LITERATURE
ELED. 5310-3. Children’s Literature
ELED. 5330-3. Current Literature for Children
ELED. 5730-3. Creative Experience in Literature

MATHEMATICS EDUCATION
ELED. 5400-3. Contemporary Mathematics in Elementary Schools
ELED. 5440-3. Problem Solving and Geometry in Elementary Schools

Electives — 9 Semester Hours

Note: Electives may include any graduate education courses and/or undergraduate courses outside the School of Education that are graduate rank. (An upper division course is graduate rank if it is taught by a member of the graduate faculty.) All courses offered toward a master’s degree must be taken within five years of one’s graduation date.

Access Program in Curriculum and Instruction Option: Elementary Education

The Elementary Education Program has an Access Program for students who wish to complete the master’s degree off-campus. Courses are held at community colleges and other sites in the Denver metropolitan area.

Requirements and quality of instruction for this program are identical to those for the on-campus program. Students should contact their advisor for further information.

COURSES

ELED. 5050-3. Mastery Learning. (SECE. 5050.) Stresses the theory and research that support the concept of mastery learning and assists the professional educator in developing the skills necessary for implementation of the theory into classroom practice.
ELED. 5060-3. Improvement of Instruction. (SECE. 5060.) Designed to assist the educator in the systematic improvement of instruction. Emphasis will be on emergent knowledge related to successful classroom practices, techniques of assessment, analysis, and action related to the improvement of professional skills.
ELED. 5080-3. Alternative Teaching Strategies: Varied Goal Structures. (SECE. 5080.) Designed to explore the research as it relates to competitive, cooperative, and individualized goal structures and to assist the teacher in selecting and implementing the appropriate structure in the classroom.
ELED. 5110-3. Supervision of Student Teachers. (SECE. 5110.) Designed to develop competency in the supervision of student teachers, including building a theoretical framework and developing skills in practical application.
ELED. 5160-3. Expressive Arts. Course serves a 3-fold purpose. First it familiarizes participants both theoretically and experientially with the expressive arts of drama, music, dance, and movement (PE, dance, and health), and visual arts. Secondly, the course explores the underlying rationale for the inclusion of arts in the elementary curriculum, especially the role of the arts in fostering cognitive development, creative problem solving, and interpersonal cooperation and communication. Finally, the course suggests ways in which the arts can be integrated into classroom activities, with the aim of viewing the act of teaching itself as an expressive art.
ELED. 5170-3. Community and Interpersonal Relations. (SECE. 5170.) Provides an opportunity for students to develop communication, and interpersonal skills that will enable them to facilitate positive student self-
concept and interaction among professional educators, the community and social groups. Exposes students to urban environment.

ELED. 5200-3. Classroom Management. (SECE. 5200.) Instructional management, physical management, and behavior management are studied as interactive components in the establishment and maintenance of an effective learning environment.

ELED. 5210-3. Models of Teaching. (SECE. 5210.) Emphasis on learning, refining, analyzing, and redesigning various teaching models including inquiry, concept attainment, role-playing, and advance organizers. Students are assigned to small groups for purposes of planning and teaching lessons designed around various models under examination.

ELED. 5310-3. Children’s Literature. Reading and evaluation of books for children, information about children’s books, children’s interest in reading, important authors and illustrators, and problems in the guidance of reading.

ELED. 5320-3. Advanced Language Arts in Elementary School. Current thought, as determined by research and practice in the various areas of the language arts: listening, speaking, reading, and writing. Issues, trends, and innovative practices are examined.

ELED. 5330-3. Current Literature for Children. Current books, trends, and media material in children’s literature. This course is for people who have not had a course in this area within the past five years. Prer., ELED. 5310 or survey course in children’s literature.

ELED. 5350-3. Science in the Elementary School. Recent developments in science, curriculum, methods, and materials in elementary science, examined for their contribution to the objectives of science in the elementary school.

ELED. 5400-3. Contemporary Mathematics for Elementary Schools. Survey of contemporary content and methodology with emphasis on interrelations between topics and techniques of providing active learning.

ELED. 5410-3. Teaching Numbers and Arithmetic. Teaching methodologies related to arithmetic and its applications. Covers mathematical attitudes, problem solving, math manipulatives, number concepts, number theory, algorithms, fractions and decimals, calculators, and integration of arithmetic with other curriculum areas.

ELED. 5430-3. Topics in Mathematics Education. An in-depth study of topics such as mathematics and learning, geometry, testing, arithmetic, mathematics labs, calculators, and computers. May be repeated as topics vary.

ELED. 5440-3. Problem Solving and Geometry in the Elementary School. Covers problem solving, spatial visualization, informal geometry, and turtle geometry with emphasis on incorporating these topics into the elementary curriculum.


ELED. 5470-3. Introduction to the Middle School. (SECE. 5470.) Covers history and philosophy of the middle school, organization plans, team teaching, integrating content areas, characteristics of the early adolescent, and classroom management.

ELED. 5480-3. Museums in Education. (SECE. 5480.) For elementary and secondary teachers, this course acquaints teachers with the educational resources extant in public institutions such as museums, zoos, historical societies, etc.

ELED. 5490-3. The Middle School Curriculum. This course will explore the unique curriculum requirements of transency youth. Topics to be addressed include team teaching, interdisciplinary curricula, flexible scheduling, basic skills development, guidance functions, fine arts, practical arts, industrial arts, career education, teaching strategies, and management techniques.


ELED. 5560-3. Energy Education. (SECE. 5560.) Explores current energy problems. Students will examine such topics as fuels from plants, fuels from wastes, fossil fuels, nuclear energy, wind energy, geothermal energy, solar energy, and energy conservation. Included will be a demonstration of available educational resources for grades K-12. The purpose of the course is to make technical aspects of energy accessible to the lay person.

ELED. 5730-3. Creative Experience in Literature. Will include selection of materials and development and presentation of storytelling, puppetry, flannel board story telling, chorale reading, slide/tape programs, movie making, creative dramatic music, movement, and art. Prer., any two of the following courses: ELED. 5310, 5320, 5330, or consent of instructor.

ELED. 5740-3. Newspaper in Curriculum. Designed to simulate the purposeful use of newspapers to enrich the instructional program in all of the content areas of the school curricula. The course will include an indepth study of selection, development, and presentation of newspaper material with implications for teaching methods and techniques.

ELED. 5780-1 to 4. Storytelling. Explore the history, function, philosophy, and techniques of storytelling. This course will also include collecting, selecting, preparing, developing, and delivering stories. Research and resources will be emphasized.

ELED. 5800-1 to 4. Curriculum Workshop for Elementary School Teachers. Opportunity to work on projects and problems in the school in which the student is employed: conferences, study groups, discussion, and work in curriculum construction. Topics and credit hours vary. Prer., 18 semester hours in education and teaching experience or consent of instructor.

ELED. 5910-1 to 4. Advanced Practicum. (SECE. 5700.) This course is not to be used as independent study, but is to be used by students approved in advance by the Director of Teacher Education. Prer., consent of instructor. Fulfills the student teaching requirement for students seeking a second endorsement.

ELED. 5920-1 to 4. Readings in Elementary Education.

ELED. 5930-1 to 8. Internship in Elementary Education.

ELED. 6100-3. Seminar: Elementary Education. Students work on individual topics and report orally and in writing.

ELED. 6310-2. Seminar: Children's Literature. In-depth study of topics such as development of a literature program, banning books, bibliotherapy, appropriateness of award-winning books, books relating to minority groups, and trends in children's literature. Prer., course in children’s literature.


Independent Study

ELED. 5840-1 to 4. Independent Study in Elementary Education.

Foundations

Coordinator: Marc C. Mahlios
Office: NC, Fourth Floor
Telephone: 556-4366
Faculty: Professor: Marie E. Wirsing

The program in foundations consists of interpretive, normative, and critical studies of educational beliefs and practices. It combines the scholarly traditions of academic disciplines with the study of educational institutions and problems. Courses are offered in the historical, philosophical, sociological, economic, political, religious, and comparative foundations of education.

Program Requirements

The total minimum preparation for an M.A. degree in curriculum, and instruction with an emphasis in foundations of education is 36 semester hours of course work (30 semester hours with thesis). Programs are mutually determined by advisor and student, and each course of study differs as a whole from others.
COURSES

FNDS. 5050-3. Critical Issues in American Education. An examination of the social values and forces in American society which shape or influence the aims, philosophies, methods, content, and problems of the American educational enterprise.

FNDS. 5100-3. Education in Other Countries. A comparative examination of the political, historical, philosophical, sociological, economic, religious and other foundational aspects of education in several selected countries.


FNDS. 5300-3. Sociology of Education. A sociological appraisal of the school in American society with reference to the status, role, activities, and relationships within the school and of the school to other social institutions.

FNDS. 5400-3. History and Philosophy of Early Education. An examination of Western intellectual heritage as it was shaped during the ancient and medieval periods; traces corresponding development of educational theory and practice and its continuing impact on modern society.

FNDS. 5410-3. History and Philosophy of Modern Education. An examination of Western intellectual heritage from the 16th to the 20th century; traces corresponding development of educational theory and practice and its continuing impact on modern society.


FNDS. 5600-3. Politics and Education. An examination of the political forces affecting American education; includes a study of the interaction of the political and educational areas.

FNDS. 5700-3. Religion and Education. An in-depth study of the constitutional and legislative provisions and judicial decisions regarding religion and the American public school.

FNDS. 5800-3. Seminar: Foundations of Education. An in-depth exploration of topics, issues, and ideas largely generated by students through their other course experiences in foundations. Prer., at least one graduate level course in foundations and consent of instructor.

FNDS. 5810-5811-1 to 3. Special Topics in Contemporary Education. Variable credit courses designed to deal with specific areas of content not covered in depth in other program offerings, e.g., the social structure of the classroom.

FNDS. 5920-3. Readings in Foundations of Education. A critical examination of very recent publications in the field of foundations: books and professional journal publications. Prer., at least one graduate level course in foundations and consent of instructor.


FNDS. 6370-1. Dissertation Seminar.

FNDS. 6920-3. Readings in Foundations of Education.

FNDS. 6930-3. Teaching Internship in Foundations of Education.


FNDS. 7930-3. Teaching Internship in Foundations of Education.


Independent Study

FNDS. 5840-1 to 4. Independent Study in Foundations of Education.

FNDS. 7840-1 to 4. Independent Study in Foundations of Education.

Reading and Writing

Coordinator: Marc C. Mahlios
Office: NC, Fourth Floor
Telephone: 556-4366
Faculty: Associate Professor: Lynn K. Rhodes
Assistant Professors: Sally Nathenson-Mejia, Nancy L. Shanklin

The master’s program is designed to prepare teachers K-6, 7-12, or K-12. Reading is a credentialed program meeting the Colorado Department of Education requirements for Reading Teacher Endorsement. Therefore, students who obtain a master’s degree in reading education from CU-Denver are certified to hold positions in public and private schools as special developmental and remedial reading teachers K-6, 7-12, or K-12. Additionally, this degree is valuable for elementary and secondary teachers who wish to enhance reading and writing instruction in their classrooms.

By placing emphasis on both reading and writing in the preparation of teachers, the master’s program is at the forefront of the field. Both processes are approached from a sociopsycholinguistic perspective that emphasizes children’s construction of meaning rather than the learning of isolated skills. Importance is placed on using theory, research, and personal reflection to inform classroom practice. The program prepares teachers to become decision makers capable of developing child-centered curriculums where each student’s reading and writing abilities are assessed in order to address developmental or special needs. Special consideration is given to working with diverse ethnic populations.

Curriculum

Course offerings lead to an M.A. degree in curriculum and instruction with an emphasis in reading and writing and with a Reading Teacher Endorsement at one of three levels: K-6, 7-12, or K-12. The following core curriculum is required of all students seeking a master’s degree regardless of level emphasized.

SCHOOL OF EDUCATION CORE CURRICULUM (9 HOURS)

REM. 5000-3. Orientation to Research and Measurement in Education

Two of the following courses under advisement:

EPSY. 5100-3. Advanced Child Growth and Educational Development
EPSY. 5140-3. Advanced Child Growth and Development
LC. 5150-3. Culture of the Classroom (recommended choice)

or

LC. 5040-3. Multicultural Education
FNDS. Any course, FNDS. 5050 or above

READING AND WRITING CURRICULUM K-6 ENDORSEMENT (28 HOURS)

RDG. 5000-3. Effective Reading and Writing Instruction: Basal Reader Programs and Thematic Units
RDG. 5030-3. Reading and Writing: Early Childhood
RDG. 5110-3. Reading and Writing: Early Childhood
RDG. 5200-3. Writing: Process, Development, and Teaching
RDG. 5400-3. Observing and Assessing Reading and Writing
RDG. 5500-3. Reading and Writing Instruction: Remedial and Exceptional Students
RDG. 6910-4. Seminar and Practicum in Reading and Writing: K-6
LC. 5810-3. Workshop in Language Acquisition and Development
or
LC. 5410-3. Literacy (recommended for intermediate teachers)
ELED. 5310-3. Children's Literature
or
ELED. 5330-3. Current Literature for Children
An elective, chosen under advisement

READING AND WRITING CURRICULUM 7-12 ENDORSEMENT (28 HOURS)

RDG. 5020-3. Reading and Writing Strategies: Secondary Content Areas
RDG. 5110-3. Reading: Process, Development, and Teaching
RDG. 5200-3. Writing: Process, Development, and Teaching
RDG. 5400-3. Observing and Assessing Reading and Writing
RDG. 5500-3. Reading and Writing Instruction: Remedial and Exceptional Students
RDG. 6911-4. Seminar and Practicum in Reading and Writing: K-12
LC. 5810-3. Workshop in Language Acquisition and Development
or
LC. 5410-3. Literacy
ELED. 5310-3. Children's Literature
or
ELED. 5330-3. Current Literature for Children
SECE. 5330-3. Seminar in Current Adolescent Literature
or
SECE. 5380-3. Adolescent Literature
An elective, chosen under advisement

READING AND WRITING CURRICULUM K-12 ENDORSEMENT (38 HOURS)

RDG. 5000-3. Effective Reading and Writing Instruction. Critically examines current basal reader programs and uses and assists teachers in the development of an effective basal reader program from a whole language perspective. Thematic units are briefly considered and developed as a means of integrating reading, writing, and elementary content areas.
RDG. 5020-3. Reading and Writing Strategies: Secondary Content Areas. Explores the value and use of reading and writing in learning in content areas. Provides specific strategies for helping content area teachers increase the learning of their students through reading and writing.
RDG. 5030-3. Reading and Writing: Early Childhood. Provides teachers with a basic understanding of reading and writing development in preschool and early primary grades. Specific strategies are considered for using and teaching reading and writing in early primary grades.
RDG. 5110-3. Reading: Process, Development, and Teaching. A variety of reading process theories are examined with a focus on those which are socio-psycholinguistic. The relationship between those process theories and reading development is considered as well as what is known about aspects of reading development. Finally, the relationship between process, development, and teaching is considered in detail.
RDG. 5400-3. Observing and Assessing Reading and Writing. Both formal and naturalistic observation and assessment principles are explored in relation to reading and writing. How to give specific tests is covered in detail. The uses of tests in both classroom and pull-out programs are explored. Prer., RDG. 5110, 5200, LC. 5810.
RDG. 5500-3. Reading and Writing Instruction: Remedial and Exceptional Students. Assists teachers in the discovery and development of current research-based reading and writing instructional strategies designed to help students who are not achieving as expected. Prer., RDG. 5000 or 5030 or 5020, RDG. 5110, 5200, 5400.
RDG. 5800, 5810, 5820, 5830-1 to 4. Special Topics in Literacy Development and Instruction. Specific topics vary but will include the exploration of literacy development and instruction in particular populations or with specific focuses.
RDG. 5920-1 to 3. Selected Readings. Selected readings for advanced study in a specific area of reading/writing instruction or research. Prer., written consent of instructor.
RDG. 6910-4. Seminar and Practicum in Reading and Writing: K-6. Supervised practicum in the evaluation and teaching of reading and writing, grades K-6. Seminar focuses on instructional problems and research-based solutions. Prer., RDG. 5000 or equivalent, RDG. 5110, 5200, 5400, 5500, ELED. 5310 or equivalent, or consent of instructor.
RDG. 6911-4. Seminar and Practicum in Reading and Writing: 7-12. Supervised practicum in the evaluation and teaching of reading and writing, grades 7-12. Seminar focuses on instructional problems and research-based solutions. Prer., RDG. 5020 or equivalent, RDG. 5110, 5200, 5400, 5500, ELED. 5310 or equivalent, or consent of instructor.

Independent Study

RDG. 5840-1 to 4. Independent Study: Reading/Writing. Intended only for those who wish to study along lines not followed by courses. Prer., written consent of instructor.
Secondary Education

Program Director: Marc C. Mahllos
Office: NC, Fourth Floor
Telephone: 556-4387
Faculty: Professors: Norma J. Livio, Glenn E. McGlathery
Associate Professors: William A. Juraschek, Marc Mahllos
Assistant Professors: John Lofty, Libby Quattromani, Lyn Taylor

Two curriculum and instruction master's degree emphases are offered in secondary education:
1. Master of Arts (M.A.), Plan I, requiring a minimum of 36 semester hours including 4 hours for a thesis and 4 to 8 hours in a minor field.
2. Master of Arts (M.A.), Plan II, requiring a minimum of 36 semester hours with or without a minor (most popular plan).

Core Courses (12 Semester Hours)

SECE. 5210-3. Models of Teaching and Observation (cross-listed with ELED. 5210)
REM. 5000-3. Orientation to Research and Measurement in Education
Two of the following three courses:
EPSY. 5020-3. Advanced Psychological Foundations of Education
LC. 5040-3. Multicultural Education
FNDS. Any foundations course is acceptable except FNDS. 5000

The remainder of the hours can be taken from among graduate offerings within the School of Education or within other departments at CU-Denver. Within this framework, there is flexibility for individualized programs for teachers of social studies, language, sciences, and mathematics. Those courses in departments other than education may be upper division undergraduate if they are taught by a member of the graduate faculty. The candidate's advisor must approve such courses if they are to be included as part of the program.

Minor Requirement

The purpose of a minor in the M.A. program is to expand the candidate's background in a specific area of interest. The minor is to be in a field other than secondary education and must have the approval of the minor department.

Access Program in Curriculum and Instruction with an Emphasis in Secondary Education

The Secondary Education Program has an Access Program for students who wish to complete the master's degree off-campus. Courses are held at community colleges and other sites in the Denver metropolitan area.

Requirements and quality of instruction for this program are identical to those for the on-campus program. Students should contact their advisor for further information.

COURSES

SECE. 5050-3. Mastery Learning. (ELED. 5050.) Stresses the theory and research that support the concept of mastery learning and assists the professional education in developing the skills necessary for implementation of the theory into classroom practice.
SECE. 5060-3. Improvement of Instruction. (ELED. 5060.) Designed to assist the educator in the systematic improvement of instruction. Emphasis will be on emergent knowledge related to successful classroom practices, techniques of assessment, analysis and action related to the improvement of professional skills.
SECE. 5080-3. Alternative Teaching Strategies: Varied Goal Structures. (ELED. 5080.) Designed to explore the research as it relates to competitive, cooperative, and individualistic goal structures and to assist the teacher in selecting and implementing the appropriate structure in the classroom.
SECE. 5100-3. Individual Education in Secondary Schools. An individualized course which aids teachers in individualizing programs in their schools.
SECE. 5110-3. Supervision of Student Teachers. (ELED. 5110.) Designed to develop competency in the supervision of student teachers including building a theoretical framework and developing skill in practical application.
SECE. 5170-3. Community and Interpersonal Relations. Provides an opportunity for pre-service teachers to develop communication and interpersonal skills that will enable them to facilitate positive student self-concept and interaction among professional educators, the community, and social groups. Exposes students to urban environment. Topics also include child abuse and its recognition.
SECE. 5200-3. Classroom Management. (ELED. 5200.) Instructional management, physical management, and behavior management are studied as interactive components in the establishment and maintenance of an effective learning environment.
SECE. 5210-3. Models of Teaching. Emphasis on learning, researching, analyzing, and redesigning various teaching models including inquiry, concept attainment, role playing, and advance organizers. Students are assigned to small groups for purposes of planning and teaching lessons designed around various models under examination.
SECE. 5250-3. Theory and Practice in Teaching English. Curriculum, materials, methods, evaluation, and related aspects of instruction. This course is designed to integrate content and methodology.
SECE. 5330-3. Seminar in Current Adolescent Literature. In-depth study and evaluation of books and films that can be used successfully with junior and senior high school students. Emphasis on materials published during the past two years.
SECE. 5350-3. Issues and Problems in Science Education. (ELED. 5350.) Recent developments in theory, curriculum, methods, and materials in secondary science, examined for their contribution to the objectives of science education.
SECE. 5360-3. Supervision of Science Curriculum. Workshop for supervisors of science in city school systems. Basic content in science fields.
SECE. 5410-3. Advanced Methods and Strategies in Secondary Mathematics. In-depth investigation of specific methods and strategies suitable for teaching mathematics for middle and senior high schools. Participants model and share various strategies including the expository, discovery, laboratory, and Socratic methods.
SECE. 5430-3. Teaching Aids in Mathematics Education. Examination, production, and use of manipulative aids, audiostream aids, and other materials for teaching mathematics. Open to elementary and secondary teachers.
SECE. 5440-3. Topics in Mathematics Education. An in-depth study of topics such as computers, testing, learning theory, mathematics laboratories. May be repeated as topics vary.
SECE. 5460-3. Theory and Practice of Social Science. Designed to meet the needs of experienced teachers and of those who will teach in public schools. Recent developments in theory and materials in the social studies examined and present practices analyzed for their contribution to general goals of social studies education. Appropriate for teachers in grades 7-12, but also profitable of elementary teachers with a specialization in social studies.

SECE. 5470-3. Introduction to the Middle School. (ELED. 5470.) Covers history and philosophy of the middle school, organization plans, team teaching, integrating content areas, characteristics of the early adolescent, and classroom management.

SECE. 5480-3. Museums in Education. (ELED. 5480.) For elementary and secondary teachers, this course acquaints teachers with the educational resources extant in public institutions such as museums, zoos, historical societies, etc.

SECE. 5490-3. The Middle School Curriculum. (ELED. 5490.) This course will explore the unique curriculum requirements of transescent youth. Topics to be addressed include team teaching, interdisciplinary curriculum, flexible scheduling, basic skills development, guidance functions, fine arts, practical arts, industrial arts, career education, teaching strategies, and management techniques.

SECE. 5590-3. Design and Analysis of Instructional Systems. Covers the theoretical rationale underlying recent advances in instructional design. Students are also expected to develop and assess materials in their own area of specialization.


SECE. 5660-3. Energy Education. (ELED. 5660.) Explores current energy problems. Students will examine such topics as fuels, nuclear energy, wind energy, geothermal energy, solar energy, and energy conservation. Included will be a demonstration of available educational resources for grades K-12. The purpose of the course is to make technical aspects of energy accessible to the lay person.

SECE. 5740-3. Newspaper in the Curriculum. Designed to stimulate the purposeful use of newspapers to enrich the instructional program in all of the content areas of the school curriculum. The course will include an in-depth study of selection, development, and presentation of newspaper material with implications for teaching methods and techniques.

SECE. 5780-1 to 4. Storytelling. (ELED. 5780) Explore the history, function, philosophy, and techniques of storytelling. This class also will include collecting, selecting, preparing, developing, and delivering stories. Research and resources will be emphasized.


SECE. 5910-1 to 4. Advanced Practicum in Teaching. This course is not to be used as independent study but is to be used by students approved in advance by the Director of Teacher Education. Prereq., consent of instructor. This course fulfills the student teaching requirement for students seeking a second endorsement.

SECE. 5920-1 to 4. Readings in Secondary Education.

SECE. 5930-3. Internship in Secondary Education.

SECE. 6100-3. Seminar: Secondary Education. Students work on individual topics and report orally and in writing. Prereq., consent of instructor.


Independent Study

SECE. 5840-1 to 4. Independent Study in Secondary Education.

EARLY CHILDHOOD EDUCATION AND EARLY CHILDHOOD SPECIAL EDUCATION

Division Coordinator: Laura D. Goodwin
Office: NC, Fourth Floor
Telephone: 556-3372
Faculty: Professor: William L. Goodwin
Assistant Professor: Harriet Able-Boone

The early childhood education program is a graduate program leading to a master's degree in early childhood education (regular or special) or certification in early childhood special education. Students may choose, via their course work and field experiences, to prepare for careers working with either young children with special needs birth to five years or young typical children birth to eight years. The program is interdisciplinary in focus, drawing upon university resources in educational psychology, special education, communication disorders, and multicultural education as well as early childhood education, and community resources for occupational/physical therapy, pediatrics, and social work. There is a strong emphasis on field experiences in both regular and special education concentrations.

The program also offers specializations in infants birth to three and in families of handicapped young children for students who wish to work in hospitals, center or home-based programs with at-risk or handicapped infants and their families. The specializations, funded through grants from the U.S. Office of Education, are jointly offered on the CU-Denver campus and the University of Colorado Health Sciences Center.

Curriculum

The master's degree in early childhood (special education) requires 39 semester hours of course work and 4 hours of practicum. Thirty-one semester hours are required for certification only. The master's degree in early childhood (regular education) typically requires 32 semester hours of course work and 4 semester hours of practicum.

The two programs share course content in:

- Normal child growth and development
- Learning approaches with young children
- Measurement and evaluation
- Basic statistics
- Multicultural education
- Research and current issues
- Early childhood curriculum and program development
- Working with parents and families

The early childhood special education program provides specialized training in:

- Developmental disorders birth to five
- Screening and assessment of young children
- Intervention strategies with infants and children
- Behavior management
- Working as a member of the transdisciplinary team
- Language development and language disorders
- Treatment of neurologically impaired children

The early childhood regular education program provides specialized training in:

- Language acquisition and development
- Reading and writing instruction
- Early childhood program administration
Infant Specialization Track

Coordinator: Laura D. Goodwin
Office: NC, Fourth Floor
Telephone: 556-3372
Faculty: Assistant Professor: Harriet Able-Boone

The program is designed to provide students with the background and skills necessary for working with handicapped or at-risk infants and their families. The specialization is available to students in the early childhood special education certification and master's degree programs, and the school psychology certification and master's degree programs. It also is available to interested graduate students in related fields, such as nursing, occupational and physical therapy, social work, and communication disorders.

The program is interdisciplinary in focus. University and community resources in communication disorders, counseling, nursing, occupational and physical therapy, pediatrics, school psychology, social work, and special education are utilized. Field work and site visits are planned in both medical and educational settings.

The specialization consists of four courses plus field work:
- Medical aspects of developmental disabilities
- Assessment of handicapped and at-risk infants
- Intervention strategies for handicapped and at-risk infants
- Infant practicum

Students in the early childhood special education master’s degree program would take these courses by advisement as part of their program requirements of coursework and practicum.

Students in the school psychology certification would take these courses by advisement, primarily as their electives. The certification program in school psychology requires 60 semester hours of coursework, including 8 hours of field work.

Family Specialization Track

Coordinator: Laura D. Goodwin
Office: NC, Fourth Floor
Telephone: 556-3372
Faculty: Assistant Professor: Harriet Able-Boone

The family specialization provides an in-depth focus on families. Students are provided with the theoretical background and skills to work with families of young special needs children. Students earn a master of arts degree. Students may also choose to complete certification requirements in early childhood special education.

The specialization consists of three courses and a one-semester practicum in a community-based, family-focused program.

Rural Outreach Program in Early Childhood Special Education

The Early Childhood Special Education Program has an outreach program for students who wish to complete their certification requirements off-campus. Certification courses are offered at selected sites in western, southern, and eastern Colorado.

Requirements and quality of instruction for this program are identical to those for the on-campus program. Students should contact their advisor for further information.

COURSES

ECE. 5010-3. Curriculum and Program Development in Early Childhood Education. Principles of early childhood program development are reviewed in the areas of curriculum, staff development, and parent involvement. Linkages are made between child development and curriculum planning. Curriculum areas considered include language, preacademics, motor, social-emotional, science, social studies, and creativity.

ECE. 5020-3. Approaches to Young Children's Learning. Review of approaches for facilitating the learning and development of young children. Examined are programs for children (infancy through age 8), including those developed under federal auspices. Approaches are considered in terms of (1) their differing views of intellectual, social, and physical development of young children; (2) their operation as program activities and procedures; and (3) their effects on children's learning.

ECE. 5030-3. Directing Programs for Young Children. Analysis of organizational factors and instructional events in the classroom. Facilitation of teacher effectiveness through supervisory feedback and inservice development. Special attention is given to supervisor-teacher relationships, parent-school-community relationships, and processes for feedback.

ECE. 5040-3. Administrative Seminar: Selected Topics in Early Childhood Education. Emphasis on those topics required of administrators in E.C.E. programs in day-to-day operations (philosophy, finance, program, management, community/parent relations, etc.). Special attention is given to unique administrative concerns in programs for special categories of children such as toddlers, developmentally delayed children, etc.

ECE. 5060-3. Working with Parents and Families. Review of historical factors and research related to current trends in working with parents in the regular classroom and with parents and families of exceptional children. The course presents content concerning family systems theory, various community services available to families, abused and neglected children, and an overview of successful programs that serve parents and families in the educational setting.

ECE. 5070-3. Cognitive/Emotional Development and Disorders in Young Children. The primary focus of this course is the cognitive and social development of infants and young children, and problems that may occur during the process. Equally emphasized are intervention approaches for preschool children with cognitive and social/emotional handicaps. Implications for intervention from current research are considered.

ECE. 5080-3. Language Development and Disorders in Young Children. Overview of normal language development, language components, and pertinent research relating to language acquisition. Emphasis is placed on language problems commonly demonstrated by young exceptional children and appropriate intervention strategies.

ECE. 5090-3. Neuromotor Development and Disorders in Young Children. This course provides an overview of normal and abnormal motor and neurodevelopmental development in the infant and young child. Current treatment approaches for children with neuromotor disorders are examined, with emphasis on sensory integration and neurodevelopmental treatment. Also reviewed are sensory deficits: hearing and visual impairment.

ECE. 5140-3. Measurement and Evaluation in Early Childhood Education. This course provides classroom experience in basic measurement concepts and in the screening and assessment of young children's cognitive, affective, language and psychomotor capabilities and characteristics. Traditional measurement techniques as well as nonreactive measures, human and video-observational methods are included. Evaluation of programs and persons in early childhood education settings is examined.

ECE. 5200-3. Screening and Assessment of Young Children. A field-based course providing experience in the administration and scoring of a sampling of the most widely used screening and assessment instruments designed for use in infant and preschool classrooms. Students will have the opportunity to administer a variety of formal...
and informal tests including the Bayley and McCarthy Scales.
ECE. 5800-1 to 4. Workshop: Topics in Early Childhood Education. Topics and credit hours vary from semester to semester.
ECE. 5911-3. Educational and Observational Practicum in Early Childhood Education. Includes planned experiences built around the clinic and E.C.E. classroom in operation. Students observe in public schools, Head Start, day care, and private preschool programs. The practicum will require 30 to 40 clock hours of field placement experience with concurrent classroom meetings. Opportunities for observation in special education classes are provided.
ECE. 5920-1 to 4. Readings in Early Childhood Education.
ECE. 6100-3. Medical Aspects of Developmental Disabilities: Birth to Three. A review of the major risk factors and developmental disabilities encountered in young children birth through three years. Medical, educational, genetic, and environmental factors are discussed. Special attention is given to recent innovations in identification and treatment of very young children.
ECE. 6110-3. Intervention Strategies for Handicapped and At-Risk Infants. In-depth study of intervention strategies, curriculum, and program models for young children birth to three years. Topics include selection, implementation, and evaluation of the different techniques. The course will have an interdisciplinary focus.
ECE. 6690-3. Seminar in Research and Current Issues in Early Childhood Education. Research methods are reviewed and then selected topics are considered. Emphasis is on research findings and current issues of importance to teachers, administrators, specialists, and researchers in early childhood and early childhood special education.
ECE. 6911-2 to 4. Practicum in Early Childhood Education. Field-based experiences in settings for young children (preschool administration, day-care center management, parent program directorship, etc.) that are closely linked to the student’s professional goals. Requires a minimum of 110, 165, or 220 clock hours under supervision (2,3, or 4 credit hours, respectively).
ECE. 6912-1 to 4. Practicum in Early Childhood Special Education. Field-based experiences in settings for young handicapped children including diagnostic clinics, Project Child Find, hospital and/or classroom. The practicum requires 300 clock hours under supervision.
Independent Study
ECE. 5840-1 to 4. Independent Study in Early Childhood Education.

EDUCATIONAL ADMINISTRATION, CURRICULUM, AND SUPERVISION

Division Coordinator: Michael J. Murphy
Office: NC 5022
Telephone: 556-4857
Faculty: Professors: Richard Koepppe, Michael J. Murphy
Associate Professors: W. Michael Martin, Russell W. Meyers
Assistant Professors: C. Kent McGuire, Nancy Sanders, Lance V. Wright
Emeritus: Bob L. Taylor

The major responsibility of the educational administration, curriculum, and supervision program faculty is to prepare leaders for public schools in Colorado and the nation. Currently, the Type D Administrator Certificate is required for people seeking building-level and district-level administrative positions.

The Program

The University of Colorado at Denver offers three degree programs in addition to or as a part of the Administrator Certification Program:

Certification Only: available for those who hold a graduate degree and who seek only Colorado administrator certification;

Master of Arts: designed for those who hold no graduate degree and who seek Colorado administrator certification or a specialized program in educational administration, curriculum, or supervision;

Specialist in Education: available to those who hold a M.A. and now seek Colorado administrator certification or a specialized program; and

Doctor of Philosophy: primarily an academic degree, although a limited number of courses that satisfy certification requirements may be included in the doctoral degree plan. The doctoral program will be extensively revised during the 1990-91 year. Consult the division office for details.

Doctor of Philosophy

Depending on graduate work completed beyond the M.A., students seeking the Ph.D. will be expected to complete 40 semester hours of course work leading up to the comprehensive examination and admission to candidacy. In addition, 30 dissertation credits are required for the dissertation. The course plan will be developed in consultation with professors in the student’s proposed area(s) of concentration and with the approval of the student’s advisor and committee.

The degree plan may include a limited number of courses that are included in the Colorado principal and/or superintendent certification programs. Transfer of doctoral work may be accomplished with the approval of The Graduate School and advisor. Students may take elective course work in related University departments with advisor approval.

Required Courses

1. Introduction to Research Methods.
2. Intermediate Statistics (REM. 5100: Basic Statistics is a prerequisite and is not included in the degree plan).
3. Experimental Design, Survey Methods, Policy Studies, Naturalistic Research, or other advanced research methods course.

Specialist in Education (Ed.S.)

The Ed.S. degree program affords opportunity for advanced graduate study and/or administrator certification. Thirty semester hours of graduate credit beyond the M.A. degree are required. The program is intended to serve individuals who have a graduate degree but who now seek administrator preparation or certification, but who do not wish to pursue a doctorate. The Specialist in Education degree does not require a thesis. A final written comprehensive examination is required.

Master of Arts

The M.A. requires course work totaling 36 semester hours beyond the bachelor’s degree. Completion of the master’s degree program DOES NOT automatically qualify persons for the Administrator Certificate. Students develop a certification plan with their advisor.
Course Plan

Level I. Core (9 semester hours total)

Students may select at least one course in each of the following three areas:
1. Advanced Psychological Foundations of Education or Multicultural Education.
2. Social/Philosophical Foundations — Most foundations courses are acceptable (after approval from advisor) except FNDS 5000.
3. Orientation to Research and Evaluation Methodology or Basic Statistical Methods

Level II. General Educational Administration (12 semester hours)
EDUC 5100. Curriculum/Program Development Evaluation
EDUC 5430. Governance and Administration of Education
EDUC 5831. School Law
EDUC 5832. Group Development and Training

Level III. Administrative Skills and Technology (17 semester hours from the following)
EDUC 5050. Computer Applications to Educational Management
EDUC 5833. School Business Management
EDUC 5835. Supervision of Instruction
EDUC 7420. Personnel Development and Training
EDUC 7430. School and Community Relations
EDUC 5834. Seminar: School Administration

The Plan II Master of Arts degree requires no thesis, but a final written comprehensive examination is required.

Colorado Administrator Certification

Principals: Certification endorsement as a building level principal is available for elementary, middle, and senior high school levels. Current Colorado Department of Education regulations require a total of 45 semester hours of study beyond the B.A. degree, including a master's degree. The following courses (in addition to those listed under the M.A. degree) are required for endorsement at the various school levels.

Senior High School
EDUC 5090. Curriculum of the Senior High School
EDUC 7370. Administration and Supervision of the Senior High School
EDUC 7931. Internship in Educational Administration and Supervision

Middle Level School
EDUC 7120. Curriculum of the Middle Level School
EDUC 7590. Administration and Supervision of the Middle Level School
EDUC 7931. Internship in Educational Administration and Supervision

Elementary School
EDUC 5070. Elementary School Curriculum
EDUC 7350. Elementary Principalship Intensive
EDUC 7360. Administration and Supervision of the Elementary School
EDUC 7931. Internship in Educational Administration and Supervision

Superintendent: Administrator certification endorsement for the superintendent is also available. Such endorsement requires:
1. 60 semester hours beyond the B.A. degree including an M.A. or higher degree.
2. Colorado Administrator Certification.
3. Completion of at least the following courses in addition to a building level administrator endorsement:
   - EDUC 7400. School Finance
   - EDUC 7410. Educational Facilities Planning
   - EDUC 7931. Internship in Educational Administration and Supervision

4. Completion of 5 courses or 12 semester hours at the University of Colorado.
5. Formal admission to the ACS program.
6. Master's degree.

Access Program in Educational Administration, Curriculum, and Supervision

The Educational Administration, Curriculum, and Supervision program at CU-Denver has recently created an off-campus administrator certification program. Front Range Community College and Arapahoe Community College are serving as locations for this new program.

Individuals with strong leadership backgrounds and administrative potential are encouraged to enroll in the access program. Requirements are identical to those in the on-campus program. For further information, please call 556-4857.

Admission Criteria/Guidelines

MASTER OF ARTS (M.A.), SPECIALIST IN EDUCATION (EDS.), AND CERTIFICATION PROGRAMS

1. Grade-Point Averages. Undergraduate — 2.75 or better on a 4-point scale; Graduate — 3.0.
2. Examination Scores. (either, not both): Miller Analogy Test (MAT) — 44 or higher; Graduate Record Examination (GRE) — 900, or higher, combined verbal and quantitative scores.
3. Review of letters of recommendation and of response to item 6 on the Application for Graduate Admission — Part II Form.
4. A writing sample may be required.

Doctor of Philosophy (Ph.D.)

The criteria/guidelines are the same as those above, except:
1. GRE scores must be submitted. A minimum of 1,000 is required for consideration for regular admission (combined verbal and quantitative scores).
2. Grade-Point Average (GPAs). Graduate GPAs above 3.0 are required and expected. Degree of success in previous graduate studies is given careful consideration. Undergraduate GPAs are also considered.
3. Considerable weight will be given to the quality of the written responses submitted with the Part II (6) Application for Graduate Admission form, as above.
4. A writing sample may be required.

(For information about and to make arrangements for taking either the MAT or GRE, all the Testing Office at 556-2861.)

Please Note: These are criteria/guidelines to be considered by the faculty committee which reviews applications for admission to these programs. Neither failing to meet any one of the criteria nor meeting the minimum standards of all criteria automatically results in recommendations to admit or to deny admission. All application materials are reviewed together to determine the likelihood of success in the programs, and admission decisions are made only after reviewing the material as a whole.

Program Information

Individuals interested in any of the programs are encouraged to contact program
area faculty to discuss these programs. Conferences prior to application are encouraged and welcomed. Following admission, students are expected to maintain frequent conferences with assigned advisers to plan and develop programs of study.

COURSES

EDUC. 5050-3. Computer Applications to Educational Management. A study of the theoretical and applied knowledge of central and school-based administrative educational applications of modern computer technology.

EDUC. 5070-3. Elementary School Curriculum. An integrating course dealing with the history, development, problems, and practices of the curriculum of the elementary school.

EDUC. 5090-3. Senior High School Curriculum. This course is concerned with the history, development, principles, problems, practices, and trends of the curriculum of the senior high school.

EDUC. 5100-3. Curriculum/Program Development and Evaluation. Fundamentals of curriculum and program development, including theoretical foundations of U.S. curriculum, practical criteria to guide decision-making, specific models and processes for curriculum/program development and appraisal, emerging issues, problems, and trends.

EDUC. 5830-3. Governance and Administration of Education. Development of governance structures and of administration as a field of study in education. Influence of governance and views of administration on educational organizations' goals, functions, and personnel. Required for masters and Type D Certification students.

EDUC. 5831-3. School Law. Recent developments including administrative implications of significant court decisions pertaining to school operations. For superintendents, principals, school board members, prospective administrators, and teachers.

EDUC. 5832-3. Group Development and Training. Organizational theory and practice for school leadership personnel with emphasis on group and organization development, group problem identification and solutions, and conflict management skills and processes, role behaviors, and goal setting.


EDUC. 5834-2. Seminar: School Administration. Knowledge and insight into organizational behavior drawing upon education and related social science concepts.

EDUC. 5835-3. Supervision of Instruction. A study of instructional supervision concepts with exercises of practical application. Effective instruction, supervision, and program evaluation in relation to schoolwide improvement. Leadership skills of staff development, curriculum development, group development, direct observation, and action research.

EDUC. 58361-4. Workshop in Educational Administration, Curriculum and Supervision.

EDUC. 5931-1 to 6. Internship in Curriculum.


EDUC. 7120-3. Curriculum of Middle Level School. The course deals with the history, development, principles, problems, practices, and trends of the curriculum of the middle level school.

EDUC. 7140-2. Student Activities Curriculum. Principles, problems, and procedures for improvement of extra class activities, student councils, home rooms in the middle level school.


EDUC. 7160-3. Processes and Materials in Curriculum Appraisal. Designed to provide curriculum workers with skills in the process of assessment of curriculum programs and skill in the appraisal of curriculum materials. Includes work in the theory of evaluation, the methodology of evaluation, and practical evaluation of curriculum. Prer. one course in curriculum.


EDUC. 7350-2. Elementary Principalship Intensive. Offered summers only. Two-week in-depth examination of the elementary school principalship. Required for Type D administrative certification, elementary school. Consent of instructor required.

EDUC. 7360-3. Administration and Supervision of the Elementary School. For administrators and teachers. Purposes, practices, and trends in administration and educational leadership.

EDUC. 7370-3. Administration and Supervision of the Senior High School. Current administrative principles and practices essential to effective organization and management. Emphasis is on leadership of the principal at the middle level school.

EDUC. 7630-2. Doctoral Seminar: Junior and Senior High School Education. For advanced students. Problems, theories, and trends in secondary education. Includes field work and individual projects.

EDUC. 7800-3. Doctoral Research Seminar: Educational Administration, Curriculum and Supervision. A required seminar in educational research for all Ph.D. students in curriculum, administration, and supervision. The seminar focuses on doctoral research study in these areas of educational research.

EDUC. 7810-3. Doctoral Seminar: School Law. An in-depth examination of the American legal process as it pertains to administration, planning, and delivery of educational programs. Involves self-selected research followed by individual or group presentations.


supervision concepts with exercises linking theory with collaborative and reflective practice to solve instructional problems.

EDUC. 7825-2. Doctoral Seminar: Educational Leadership. Seminar dealing with processes and patterns of educational leadership in the schools. Various theories of leadership are considered in relation to students’ leadership behaviors. May be taken more than one semester for credit with advisor’s approval.

EDUC. 7911-1 to 4. Practicum in Educational Administration, Supervision, and Curriculum.

EDUC. 7921-1 to 4. Readings in Educational Administration, Curriculum, and Supervision.

EDUC. 7931-1 to 6. Internship in Educational Administration and Supervision. Consent of instructor required.

EDUC. 7932-1 to 6. Internship in Curriculum. Consent of instructor required.


Independent Study

EDUC. 5840-1 to 4. Independent Study in Educational Administration, Curriculum and Supervision — Master’s.

EDUC. 6840-1 to 4. Independent Study in Educational Administration, Curriculum and Supervision — Doctor’s.

EDUC. 7840-1 to 4. Independent Study in Educational Administration, Curriculum and Supervision (Doctoral).

Instructional Technology

Coordinator: David H. Jonassen
Office: NC, Fifth Floor
Telephone: 556-3354
Faculty: Professors: Minaruth Galey, David H. Jonassen
Associate Professors: Martin Tessmer, Duane K. Troxel, Brent Wilson
Assistant Professor: R. Scott Grabinger
Emeritus: Bettie R. Helser

The Ph.D. in Educational Administration, Curriculum and Supervision with an emphasis in instructional technology is designed for advanced graduate study in this field. The program is intended for students who are professionally committed to the field, as evidenced by previous professional experience in public or higher education, corporate training and development, or educational technology. The program will stress collegial and collaborative relationships with faculty in designing and carrying out research and development programs. Graduates will assume leadership roles in business, universities, or other agencies committed to the meaningful application of various technologies to instruction.

Program of Study

GENERAL EDUCATION TECHNOLOGY CORE

EDUC. 6110-3. Application of Educational Technology

EDUC. 6120-3. Instructional Development: Front End Analysis

EDUC. 6190-3. Advanced Seminar in Instructional Design / Development

PSY. 6000-3. Seminar in Educational Psychology

INSTRUCTIONAL DEVELOPMENT TRACK

IT. 5610-3. Developing Computer-Based Instruction

IT. 6610-3. Advanced Courseware Design Seminar

INSTRUCTIONAL COMPUTING TRACK

IT. 5610-3. Developing Computer-Based Instruction

IT. 6610-3. Advanced Courseware Design Seminar

HIGHER EDUCATION TRACK

PSY. 5700-3. Research in Educational Psychology
Refer to the Instructional Technology section for IT course descriptions.

Master of Arts

The Educational Administration, Curriculum, and Supervision degree with an option in instructional technology is awarded for study in the area of instructional technology. There are four program tracks under this degree program. The Educational Media Specialist Certification track is designed to prepare educational media specialists (school librarians) for elementary and secondary school library media centers. Upon completion of the program, graduates meet the requirements for endorsement as library media specialists by the Colorado Department of Education. The Corporate Instructional Development and Training track is designed to prepare trainers in corporate, agency, and military settings. The program of study is based upon nationally defined competencies and a regional needs assessment. This program track requires study in the College of Business in addition to education. The Instructional Computing track is designed to prepare teachers to use computing resources in the classroom and in other educational settings, and to provide computing leadership in their schools and districts. These individuals will be able to design, evaluate, and implement computer-based learning materials into existing curricula and programs. The Instructional Technologist track provides the opportunity for students to work with a faculty committee in defining an individual program of study in the area of instructional technology. The student needs to have a clear purpose and direction before electing this track. Consultation with a committee is essential.

EDUCATIONAL MEDIA SPECIALIST PROGRAM TRACK

The Division of Instructional Technology currently offers two programs that prepare certified teachers for educational media specialist positions (school librarians) in elementary and secondary school library media centers. These programs are a 29 semester hour program for an Educational Media Specialist at either the elementary (K-6) level or the secondary (7-12) level and a masters degree program for an Educational Media Specialist, K-12. Upon completion of either program, graduates meet the requirements for endorsement (Standard 8.02) as stated by the Colorado Department of Education. In addition, the programs are accredited by the North Central Association (NCA) and the National Council for Accreditation of Teacher Education (NCATE).

To be endorsed as an educational media specialist, an applicant shall hold or be eligible for a Type A or equivalent certificate and shall have completed the following requirements:
1. Hold a master’s or higher degree from an accredited institution of higher education and have completed an approved graduate program in educational media in an accepted institution of higher education.
2. Have completed three years of teaching experience and/or school media experience while holding a valid Colorado Type A or equivalent certificate.
3. Have knowledge and skills in the following areas:
   - Administration of a media program
   - Media cataloging and classification
   - Media production and design
   - Reference services
   - Media selection, evaluation, and utilization
   - Research and evaluation
   - Media materials for children and youth
   - Curriculum development and instruction design
4. Have completed a supervised practicum or internship in an elementary and/or secondary school at the appropriate grade level(s) for endorsement (elementary, secondary, or K-12). The practicum or internship may be waived upon comparable media experience. The Educational Media Specialist track prepares candidates to meet these standards.

Admission Requirements

1. Bachelor’s degree from an accredited institution with a grade-point average of 2.75 or higher.
2. A Colorado Type P or A teaching certificate. A teaching certificate from another state may be accepted for admission, but the Colorado certificate must be acquired prior to completing 12 semester hours of instruction.
3. Completion of a minimum of three years teaching and/or school media experience while holding a valid Colorado Type A or equivalent (may be completed concurrently, but requirement must be satisfied by the time the degree is awarded).
4. Three letters of recommendation from individuals who are in a position to evaluate your professional competence as well as your potential for graduate study.
5. A letter accompanying your application which details your educational and professional experiences, your reasons for pursuing the endorsement, and the professional contribution which you hope to make after completing the program.

There is no interview requirement, so this may be your only opportunity to convince the faculty of your verbal fluency and your professional commitment.

Master’s degree candidates (K-12) must also submit Graduate Record Examination scores (verbal and quantitative) of 950 or higher OR Miller Analogies Test score of 45 or higher. NOTE: This requirement may be waived if you have completed a master’s degree in a related field prior to application to this program.

Program Requirements

A. Educational Media Specialist, K-12, Master’s Degree

1. At least 37 semester hours of course work:
   - IT. 5010-3. Instructional Role of the Media Specialist
   - IT. 5020-3. Selection/Evaluation of Educational Media
   - IT. 5030-3. School Reference Service
   - IT. 5040-3. Cataloging/Classification of Educational Media
   - IT. 5050-3. Administration of Library Media Programs
   - IT. 5310-3. Production of Educational Materials
   - ELED. 5310-3. Children’s Literature
   - SECE. 5380-3. Adolescent Literature
   - IT. 5911-2. Field Experience in Library Media — Elementary
   - IT. 5912-2. Field Experience in Library Media — Secondary
   - IT. 5520-3. Educational Application of Computer-Based Utility Programs
   - REM. 5200-3. Introduction to Research Methods
   - LC. 5040-3. Multicultural Education

2. Comprehensive Examination. During the final semester of enrollment, you will complete a four-hour written examination covering the curriculum. The examination may be repeated once after a period of three months.

B. Educational Media Specialist, K-6 or 7-12 Endorsement

At least 29 semester hours of course work:

- The remaining courses are as follows:
  - IT. 5010-3. Instructional Role of the Media Specialist
  - IT. 5020-3. Selection/Evaluation of Educational Media
  - IT. 5030-3. School Reference Service
  - IT. 5040-3. Cataloging/Classification of Educational Media
  - IT. 5050-3. Administration of Library Media Programs
  - IT. 5310-3. Production of Educational Materials
  - ELED. 5310-3. Children’s Literature
  - SECE. 5380-3. Adolescent Literature
  - IT. 5911-2. Field Experience in Library Media — Elementary
  - IT. 5912-2. Field Experience in Library Media — Secondary
  - IT. 5520-3. Educational Application of Computer-Based Utility Programs
  - REM. 5200-3. Introduction to Research Methods
  - LC. 5040-3. Multicultural Education
IT. 5010-3. Instructional Role of the Media Specialist
IT. 5020-3. Selection/Evaluation of Educational Media
IT. 5030-3. School Reference Service
IT. 5040-3. Cataloging/Classification of Educational Media
IT. 5050-3. Administration of Library Media Programs
IT. 5310-3. Production of Educational Materials
IT. 5520-3. Educational Applications of Computer-Based Utility Programs
REM. 5200-3. Introduction to Research Methods

K-6 Endorsement
ELED. 5310-3. Children's Literature
IT. 5911-3. Field Experience in Library Media — Elementary

7-12 Endorsement
SECE. 5380-3. Adolescent Literature
IT. 5912-2. Field Experience in Library Media — Secondary

CORPORATE INSTRUCTIONAL DEVELOPMENT AND TRAINING TRACK

This program has been designed to meet the specific instructional needs of trainers in corporate settings. The competencies taught are based upon three separate needs assessments conducted by and with major professional associations in the field. The program is designed to prepare graduates for working in a corporate or agency training environment as a trainer or instructional developer. In addition to traditional admission requirements, we intend to accept only outstanding individuals with a professional commitment and outstanding written and interpersonal communication skills.

Graduates of this program will be prepared to assume positions as trainers and/or instructional developers in business, industry, government agencies, military, or other training facilities.

Admission Requirements

In order to be admitted to this program you need to provide evidence of each of the following:
1. Bachelor's degree in a relevant field from an accredited institution of higher education with a grade-point average of 2.85 or higher OR Graduate Management Aptitude Test with appropriate score.
2. Graduate Record Examination score (combined verbal + quantitative) of 950 or higher OR Miller Analogies Test score of 50 or higher.
3. Four letters of recommendation from individuals who are in a position to evaluate your professional competence as well as your potential for graduate study.
4. A letter of application detailing your educational and professional experiences, your reasons for pursuing graduate study, and the professional contributions which you believe that you will be able to make after completing the degree. There is no interview requirement for this program, so this may be your only opportunity to convince the faculty of your commitment.
5. At least two samples of your writing. These may be articles, instructional materials, reports, or proposals.

Program Requirements

PROFESSIONAL ORIENTATION CORE (from the Graduate School of Business Administration)

Six or more hours from the following

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT. 6800. Human Resource Management</td>
</tr>
<tr>
<td>BUSN. 6040. Human Behavior in Organizations</td>
</tr>
<tr>
<td>MGMT. 6320. Organizational Development</td>
</tr>
<tr>
<td>PSY. 5150. Organizational Psychology</td>
</tr>
<tr>
<td>or more</td>
</tr>
</tbody>
</table>

LEARNING FOUNDATIONS CORE

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPSY. 5240. Cognition and Instruction</td>
</tr>
<tr>
<td>EPSY. 5220. Adult Learning and Education</td>
</tr>
<tr>
<td>REM. 5400. Introduction to Evaluation of Programs and Persons</td>
</tr>
<tr>
<td>9</td>
</tr>
</tbody>
</table>

INSTRUCTIONAL DEVELOPMENT CORE

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT. 5110. Instructional Design: Front End Analysis</td>
</tr>
<tr>
<td>IT. 5120. Instructional Development: Strategy Selection and Development</td>
</tr>
<tr>
<td>IT. 5150. Analyzing Learner Characteristics</td>
</tr>
<tr>
<td>IT. 6110. Managing Instructional Development</td>
</tr>
<tr>
<td>IT. 6120. Instructional Development Consultation</td>
</tr>
<tr>
<td>IT. 6130. Formative Evaluation of Instructional Materials</td>
</tr>
<tr>
<td>or more</td>
</tr>
</tbody>
</table>

PRODUCTION CORE

<table>
<thead>
<tr>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT. 5410. Designing Instructional Textual Materials</td>
</tr>
<tr>
<td>IT. 5610. Developing Computer Based Instruction</td>
</tr>
<tr>
<td>IT. 5310. Production of Educational Materials</td>
</tr>
<tr>
<td>IT. 5370. Portable Video Production for Instruction/Training</td>
</tr>
<tr>
<td>Total Semester Hours — 37 or more</td>
</tr>
<tr>
<td>or more</td>
</tr>
</tbody>
</table>

Internship

The internship is the culmination of your program and is completed in lieu of a comprehensive examination and a thesis. It is designed to provide you with the opportunity to apply what you have learned and to develop a portfolio of relevant experience and products that should assist you in placement.

INSTRUCTIONAL COMPUTING TRACK

This track is intended to develop personnel in schools who are able to administer and apply technologies in classrooms and other instructional settings. The instructional computing graduate has responsibilities that include computer skills; curriculum planning and computer integration; staff development; hardware and software evaluation; design, production, and evaluation of courseware; and management of computers in the classroom.

Admission Requirements

1. Bachelor's degree from an accredited institution of higher education with a grade-point average of 2.85, or higher.
2. Graduate Record Examination score (combined verbal + quantitative) of 950 or higher OR Miller Analogies Test score of 45 or higher.
3. Three letters of recommendation from individuals who are in a position to evaluate your professional competence as well as your potential for graduate study.
4. A letter accompanying your application which details your educational and professional experiences, your reasons for pursuing graduate study, and the professional contribution which you hope to make after completing the degree. There is no interview requirement so this may be your only opportunity to convince the
faculty of your verbal fluency and your professional commitment.
Note: If you are seeking a position in the public schools, a Colorado Type A teaching certificate is required. A teaching certificate from another state may be accepted, but the Colorado certificate must be acquired prior to completing 12 semester hours of instruction.

Program Requirements

Complete 36 semester hours from the following program of study:

INSTRUCTIONAL DESIGN AND FOUNDATIONS (6 SEMESTER HOURS)

Select with your advisor 12-15 semester hours from the courses below.

- IT. 5110-3. Instructional Design: Front End Analysis
- IT. 5120-3. Instructional Development: Strategy Selection and Development
- EPSY 5240-3. Cognition and Instruction
- REM. 5400-3. Introduction to Evaluation of Programs and Persons
- EDUC. 5830-3. Governance and Administration of Education
- LC. 5040-3. Multicultural Education

CURRICULUM INTEGRATION

Complete the following course:

- IT. 5510-3. Integrating Computers in the Curriculum

TOOLS AND APPLICATIONS

Select at least 7 semester hours from the courses below.

- IT. 5520-3. Application of Computer-Based Utility Programs
- IT. 5550-2. Information Storage and Retrieval
- IT. 5990-3. Special Topics: Desktop Publishing in Education
- IT. 6620-3. Intelligent Computer-Based Instruction

COMPUTER-BASED PRODUCT DESIGN

Select at least 5 semester hours from the courses below.

- IT. 5610-3. Developing Computer-Based Instruction
- IT. 5630-2. Designing Computer-Based Simulations
- IT. 6630-2. Advanced Courseware Design Seminar

LANGUAGES

Select at least 3 semester hours from the courses below.

- IT. 5580-3. Pascal for Educators
- IT. 5590-3. Logo: Logic, Programming, and Instructional Techniques
- IT. 5990-3. Special Topics: Advanced HyperCard

Master's Project

In order to fulfill the comprehensive examination requirement, you will complete a Comprehensive Master's Project. This project fills the role of a comprehensive examination. During your final semester of instruction, you will complete a project on a problem area chosen in consultation with your advisor. The project will be one of the following types: (1) development, (2) evaluation, or (3) research. A development project results in an instructional package making use of computers as a teaching tool or resource. An evaluation project either reviews computer-based curriculum materials in a chosen domain or evaluates a program or product in a realistic setting. A research project investigates a theoretical problem using established qualitative or quantitative methods of inquiry.

Master's advisors may choose to adapt or waive any of the above requirements if a student demonstrates competence in selected competency areas. The waiving of requirements allows you greater flexibility in choosing electives for your program of study.

INSTRUCTIONAL TECHNOLOGIST TRACK

This track is provided to permit students to specialize in an area of instructional technology not described in the other three tracks. Possible specializations include:

- Instructional television production
- Instructional materials production
- Computer-based instructional system design
- Health sciences education

Admission Requirements

1. Bachelor's degree from an accredited institution with a grade-point average of 2.85 or higher.

2. Graduate Record Examination scores (verbal + quantitative) of 950 or higher

OR Miller Analogies Test score of 45 or higher. Note: This requirement may be waived if you have completed a master's degree in a related field prior to application to the program.

3. Three letters of recommendation from individuals who are in a position to evaluate your professional competence as well as your potential for graduate study.

4. A letter accompanying your application which details your educational and professional experiences, your reasons for pursuing graduate study, and the professional contributions which you hope to make after completing the degree. There is no interview requirement, so this may be your only opportunity to convince the faculty of your verbal fluency and your professional commitment.

Program Requirements

Before taking any courses, the student must consult with an advisor, who will help identify career aspirations of the student. Based upon those aspirations, the student and advisor will identify program committee faculty members specializing in the area of the aspirations, then design a program of course work.

CORE REQUIREMENTS (15 SEMESTER HOURS)

- EPSY. 5240-3. Cognition and Instruction
- IT. 5110-3. Instructional Design: Front End Analysis
- IT. 5120-3. Instructional Development: Strategy Selection and Development
- REM. 5300-3. Introduction to Measurement
- REM. 5400-3. Introduction to Evaluation of Programs and Persons
- LC. 5040-3. Multicultural Education or Foundations course

Total Semester Hours — 15

ELECTIVES

21 semester hours of course work selected by the student in consultation with the student's committee.

COMPREHENSIVE EXAMINATION

During the final year of enrollment, the student will complete a four-hour written examination covering the curriculum studied. The comprehensive examination may be repeated once.
Master’s Research Project

During the final semester the student will design, develop, and evaluate an instructional system which reflects the student’s specialization. This might entail developing instructional materials, a support system, instruction/training, or another project. With the assistance and approval of the program committee, the student will identify a problem, two or more solutions to that problem, and systems for solving the problem. The faculty will emphasize the dissemination of this report in a journal or local, regional, or national conference.

COURSES

IT. 5010-3. Instructional Role of the Media Specialist. Analysis of the instructional and curricular role of the media specialist in selecting, identifying, and producing instructional resources and interacting with faculty. Emphasis on instructional design and curriculum development.

IT. 5020-3. Selection/Evaluation of Educational Media. Policies, procedures, selection aids, and evaluation criteria needed to develop and maintain a school library media collection are studied.


IT. 5040-3. Cataloging/Classification of Educational Media. Terminology, philosophy, and practice in the application of cataloging, classification, and filing pertaining to various types of media.

IT. 5050-3. Administration of Library Media Programs. Problems in the organization and administration of educational media programs that are an integral part of the teaching and learning process in the public schools.

IT. 5110-3. Instructional Design: Front End Analysis. Instructional design principles and procedures, including performance analysis, needs assessment, objectives, task analysis, and criterion test design, are required for all instructional technology students.

IT. 5120-3. Instructional Development: Strategy Selection and Development. Instructional development principles and procedures for developing instructional sequences for facts, concepts, procedures, and principles, Application of different instructional and development models.

IT. 5130-3. Instructional Message Design. Principles and practices for designing textual, visual, and auditory instructional messages based upon the behavioral sciences.

IT. 5150-2. Analyzing Learner Characteristics. An introduction to the analysis of learner characteristics and styles and how they impact on learning, with emphasis on instructional design implications. For students in the corporate training and instructional technologist tracks.

IT. 5180-3. Instructional Technology for Teachers. Designed to acquaint students with basic procedures to selecting, producing, evaluating, and utilizing instructional media/technology, including microcomputers and television, in the instructional process. Required only for teacher certification program.

IT. 5310-3. Production of Educational Materials. Design and production of materials such as video, slides, and photo essays to support objectives.

IT. 5360-1. Evaluating and Utilizing Instructional Television. Principles and procedures in evaluating, utilizing, and integrating instructional television into the instructional process.


IT. 5410-3. Designing Instructional Textual Materials. Instructional, structural, and typographic principles and techniques for designing print instructional materials, including programmed instruction, job aids, diagrams, documents, electronic text, and information mapping.

IT. 5510-3. Integrating Computers in the Curriculum. Principles for evaluating and selecting instructional microcomputer software and meaningful integrating it into the curriculum as well as utilization of procedures for locating and processing the software.

IT. 5520-3. Educational Applications of Computer-Based Utility Programs. Utilizing word processing, database management systems, spreadsheets, graphics, and communication software to facilitate learning and managing the instructional process.

IT. 5550-2. Information Storage and Retrieval. Examination of the various types of retrieval systems for use in media programs. Several approaches to information retrieval include (1) manual information retrieval systems, (2) whole document retrieval systems, and (3) computer-based retrieval systems.

IT. 5570-3. BASIC for Educators. How to design and write BASIC programs to facilitate instruction as well as how to teach BASIC to students.

IT. 5580-3. Pascal for Educators. How to design and write Pascal programs on microcomputers to facilitate learning and instruction and how to teach Pascal to students.


IT. 5610-3. Developing Computer-Based Instruction. Principles of instructional design applied to designing computer-based instruction. Programs may be developed in an authoring system or programming language.

IT. 5620-3. Authoring Systems and Language. Hands-on comparison of various authoring systems and languages for creating interactive, microcomputer-based coursework and interactive videodisc instruction.


IT. 5911-1 to 4. Field Experience in Library Media: Elementary. Provides practical experience in the management of a library media program. Includes 80 hours in an elementary school setting.

IT. 5912-1 to 3. Field Experience in Library Media: Secondary. Provides practical experience in the management of a library media program. Includes 80 hours in a secondary school setting.

IT. 5990-1 to 3. Special Topics in Instructional Technology.


IT. 6120-2. Instructional Development Consultation. Interpersonal skills used when working with clients, subject matter experts, or teams during instructional development.


IT. 6190-1 to 4. Advanced Seminar in Instructional Design/Development. Topical seminars to investigate issues, new models, or techniques in the field of instructional design and development.

IT. 6510-3. Computer Graphic Systems. Introduction to electronic graphics technology for educators and instructional designers. Emphasis upon recent advances in computerized processing of imaging data including video capture, image scanning and processing, graphics workstations, computer-aided design (CAD), computer-assisted animation, and desk-top publishing as they
apply to solving problems in education, business, and industry.

IT. 6530-3. Interactive Video. Study and application of systems combining the unique instructional advantages of video and of microcomputers emphasizing levels of interactivity, program design, hardware/ software configurations, data collection, and types authoring systems and programs.

IT. 6610-1 to 3. Advanced Courseware Design Seminar. Exploration of selected topics, issues, and techniques in designing interactive, microcomputer-based instruction and implementation using those techniques.

IT. 6620-3. Applications of Artificial Intelligence to Education. Application of artificial intelligence principles to the design of computer-based instructional systems.

IT. 6710-3. Theoretical Bases for Instructional Technology. Seminar on the theoretical foundations of the field of instructional technology, including behavioral, cognitive, and systems theories. For doctoral students.


IT. 6750-3. Learner Based Technologies. Analysis, design, utilization, and implementation of learner oriented instructional activities (soft design technologies), such as study and cognitive learning strategies, neuro-linguistic programming, suggestopedia, and others.

IT. 7930-1 to 6. Internship in Instructional Development and Training. Placement in an agency or business where you will function in a consultative relationship with the agency to assess needs, design, develop, and evaluate an instructional system to solve some performance problem.


Independent Study

IT. 5840-1 to 4. Independent Study in Instructional Technology.

EDUCATIONAL PSYCHOLOGY

Division Coordinator: Laura D. Goodwin
Office: NC, Fourth Floor
Telephone: 556-3535
Faculty: Professors: William L. Goodwin, Kaoru Yamamoto
Assistant Professors: Elizabeth Doll, Ellen Stevens

The M.A. program in educational psychology prepares students to facilitate the teaching/learning process. Thus, many students pursue the degree to enhance their skills as professional classroom teachers. The degree also provides skills necessary for a variety of roles where knowledge of learning, development, and research is essential. Other students seek the M.A. as preparation for certification in school psychology or for doctoral study in educational psychology. (Students planning to continue graduate work beyond the M.A. level should become familiar, before enrolling, with certificate, specialist, or doctoral degree program prerequisites and requirements so that their master's program can be tailored to assure a smooth transition to such advanced work.)

Areas of Concentration

Five major areas of concentration are available — human learning, child growth and development, research and evaluation, preparation for school psychology, and individualized programs (such as adult learning). Regardless of the concentration area selected, all students must:

1. Take 9 hours of core courses required by the School of Education.
2. Demonstrate competence in educational psychology by successfully completing a minimum of 36 hours of relevant coursework (9 of which are the core).
3. Complete either a master's thesis (4 semester hours, M.A. Plan I) or an independent study project (3 to 4 semester hours, M.A. Plan II), the latter involving the collection of data bearing on a given problem and its analysis and interpretation in writing.
4. Perform satisfactorily on a four-hour written comprehensive examination (typically taken during the last term enrolled in regular courses).
5. Complete the degree on a timely basis, usually within three years.

School Psychology Certification

The program is designed to provide students with the skills and background necessary to provide school psychological services. Certification is available to students admitted to the Education Psychology/School Psychology track. The program involves a minimum of 60 graduate credit hours. Upon completion, the student is recommended to the State Education Department for the School Psychology Certificate.

The program provides students with strong academic preparation in areas such as child development, human learning, multicultural issues, research methodology, and special education. The school psychological services model is one of consultation, individual and group intervention techniques, psychoeducational assessment, and the provision of school psychological services. An early childhood special education track and an infant specialization track are available as specialty training areas in school psychology. The program includes field work in an agency or business where you will function in a consultative relationship with the agency to assess needs, design, develop, and evaluate an instructional system to solve some performance problem.

COURSES

EPSY. 5000-3. Psychological Foundations of Education. A survey of results of psychological inquiry with emphasis on applications to educational practices. Major topics are motivation, behavior, learning, development, measurement, and characteristics of teachers and students.

EPSY. 5020-3. Advanced Psychological Foundations of Education. An examination of selected topics in the field of educational psychology; theoretical issues and current research assume the primary emphasis. The course is intended primarily for students who have had prior professional experiences in teaching and psychoeducational settings. Topic areas addressed include research on intelligence and child development, motivation, objective analyses of behavior, and learning.

EPSY. 5050-3. Children's Thinking. A review of the psychology of thinking with emphasis on developmental changes in modes of thought. Topics include conceptual behavior, problem solving, creativity, humor, play, and others.

EPSY. 5100-3. Advanced Child Growth and Development. A systematic study of the major theories of child growth and development. The course focuses on current research regarding children and the implications of research for education.

EPSY. 5110-3. Human Learning. A review of the research methods and results of the study of human learning, including related topics such as information processing and motivation. Various theories of learning are examined in depth, and their applications to teaching and practices in schools (and in other educational settings) are considered.


EPSY. 5140-3. Advanced Adolescent Growth and Development. A systematic study of the major theories of adolescent growth and development. The course focuses on current research regarding adolescents and the implications of research for education.
EPSY. 5160-3. Behavior Disorders in Exceptional Children. An in-depth study of the psychological, social, and behavioral problems of exceptional learners. Topics to be discussed include identification, etiology, educational assessment and strategies, non-educational intervention, parent programing, and evaluation. Special attention is given to current research and its application for education.

EPSY. 5170-3. Behavior Analysis and Intervention. This is an application level course that focuses on the development of social and affective skills for children and adolescents. Students will gain actual experiences in the analysis and implementation of a variety of behavioral, ecological, and psycho-educational interventions. Topics addressed include historical antecedents, identification, and characteristics of such children, research efforts and measurement issues, and relevant programs and teaching strategies.

EPSY. 5180-3. Psychology of Gifted, Talented, and Creative Children. An examination of the nature of gifted, talented, and creative children from an educational psychology perspective. Topics addressed include historical antecedents, identification, and characteristics of such children, research efforts and measurement issues, and relevant programs and teaching strategies.

EPSY. 5200-3. Social Psychology of Learning. Analysis of social-psychological concepts, such as self-concept, attitude development, person perception, group processes, and related phenomena. Applications to education and other settings are considered.

EPSY. 5220-3. Adult Learning and Education. Survey of theories and principles of adult learning and adult education with emphasis on practical applications and design of programs of instruction for adult learners.

EPSY. 5240-3. Cognition and Instruction. Exploration of recent developments in cognition and the implications for instructional practices. Includes theory and research in cognitive psychology and educational practices resulting from it.

EPSY. 5800-1 to 4. Workshop: School Applications of Educational Psychology. Research, development, and other scholarly activities in educational psychology are studied and reviewed; applications are then made to school settings with student practice and utilization of techniques emphasized.

EPSY. 5920-1 to 4. Readings in Educational Psychology.

EPSY. 6000-3. Proseminar in Educational Psychology. Examination of current and classic research in educational psychology. Consideration of personalities in the field, likely trends, and related topics. Prer., consent of instructor.

EPSY. 6100-3. School Psychology Seminar. An introductory seminar in school psychology. The seminar covers theories and models of school psychological services, legal, legislative, and ethical concerns, as well as other current topics in the field.

EPSY. 6120-3. Family Dynamics. Review and analysis of issues related to families with handicapped or at-risk young children. Topics include coping skills, family involvement, parent-child interaction, and sources of support. Special attention is given to current research and its application to early intervention.

EPSY. 6150-4. Psychoeducational Assessment I. This course focuses on the assessment of child and adolescent psychoeducational skills. Primary emphasis is directed toward cognitive/intellectual evaluation in clinical and school settings. Topics include selection, administration, and interpretation of individual intelligence tests; an introduction to psychological report writing and historical, theoretical, and psychometric issues associated with intelligence. Test administration is required. Prer., EPSY. 5020, REM. 5160.

EPSY. 6160-4. Psychoeducational Assessment II. In-depth study of the major techniques of psychodiagnosis and achievement assessment and their applicability to problems found in psychoeducational settings. Administration and interpretation of individual intelligence, special ability, personality, and achievement tests with attention to case study integration is required. Prer., EPSY. 5020, REM. 5300, EPSY. 6150.

EPSY. 6170-3. Assessment of Handicapped and At-Risk Infants. This course provides classroom and field-based experience in the assessment of young children birth to three years. Topics include selection, administration, and interpretation of a variety of tests. Norm-referenced and criterion-referenced tests and observational methods will be included.

EPSY. 6200-3. Human Development over the Life Span. An inquiry into the experience and meaning of human development over the full span of life. Both analytical and reflective modes of exploration are utilized to approach the study of personhood and the courses and themes of life.

EPSY. 6910-2 to 4. Practicum in Educational Psychology. Field-based experiences in settings (schools, businesses, governmental agencies, special projects, etc.) that are linked closely to the students professional objectives. Requires a minimum of 110, 165, or 220 clock hours under supervision (2, 3, or 4 credit hours respectively). Prer., consent of instructor.

EPSY. 6911-4. School Psychology Practicum. The practicum allows students to integrate theory with school psychology practice. Consultation, psychoeducational assessment, and other school psychological services are stressed. Prer., admission to school psychology program.

EPSY. 6930-4. School Psychology Internship. The internship stresses the professional practice of school psychology in a psychoeducational facility. Field experiences will encompass an array of school psychological services. Prer., admission to school psychology program.


EPSY. 7910-4. Education Psychology Practicum.

Independent Study

EPSY. 5840-1 to 4. Independent Study in Educational Psychology.

RESEARCH AND EVALUATION METHODOLOGY

Division Coordinator: Laura D. Goodwin
Office: NC, Fourth Floor
Telephone: 556-3535
Faculty: Professors: Laura D. Goodwin, William L. Goodwin
Assistant Professor: Alan Davis

This area provides a service to all education master's programs, offering courses in research methods, evaluation, statistics and measurement. There is also a REM emphasis track within the educational psychology master's degree program.

COURSES

REM. 5000-3. Orientation to Research and Measurement in Education. A survey-type course that provides an overview to the research process and to various types of research, and to major concepts and techniques in educational measurement. The emphasis are on: 1) critiquing in educational research studies; and 2) critiquing tests and other measures used in educational research as well as for other assessment purposes. A limited coverage of statistics is included.

REM. 5100-3. Basic Statistics. A first-level course that is oriented to the use and interpretation of descriptive and inferential statistics. Topics covered include frequency distribution, measures of central tendency, measures of variability; contingency tables; chi-square; scattergrams, correlation and regression; t-test and analysis of variance.

REM. 5200-3. Introduction to Research Methods. A survey-type course that examines the purposes of research, the methods and designs of quantitative and qualitative research, and the processes involved in research studies. The methods of research examined include experimental designs, quasi-experimental designs, descriptive surveys, case studies, ethnographies, and correlational designs. Designing a research study is part of the course activities.

REM. 5300-3. Introduction to Measurement. A first-level course that examines the nature and purpose of measurement. Particular attention is paid to the concepts of reliability, validity, norms, interpretation of
scores, response sets, fairness in testing, and norm-referenced vs. criterion-referenced tests. A variety of instruments that are used to measure human attributes and behaviors are studied. 

REM. 5350-3. Workshop in Instrument Development. Oriented toward providing an opportunity to learn the art and technology of developing different measurement tools in education. Students will develop an instrument of their own design. Topics vary.

REM. 5400-3. Introduction to Evaluation of Programs and Persons. A first-level course that examines the models and methods of evaluating programs and persons in education and related fields, such as business and nursing. Particular emphasis is given to the topics of formative and summative evaluation, frameworks for program evaluation, teacher evaluation, merit pay, and the measurement and design problems associated with each topic.

REM. 5910-1 to 3. Practicum in Research and Evaluation Methodology. Supervised work in projects that would provide for experience in data analysis, research, measurement, or evaluation.

REM. 5920-1 to 3. Readings in Educational Statistics.
REM. 5921-1 to 3. Readings in Educational Research.
REM. 5923-1 to 3. Readings in Educational Measurement.
REM. 5924-1 to 3. Readings in Program Evaluation.
REM. 7110-3. Intermediate Statistics. A continuation of REM. 5100 to more advanced methods of analyzing data but still with an emphasis on the use and interpretation of descriptive and inferential techniques. Topics covered are one-way and two-way analysis of variance, power, multiple comparisons, partial correlation, multiple correlation and regression, analysis of covariance, and selected use of packaged statistical programs. Prerequisite: REM. 5100 or equivalent.

Independent Study

REM. 5840-1 to 4. Independent Study in Research and Evaluation Methodology.

SPECIAL EDUCATION: TEACHER 1 AND 2 PROGRAMS

Division Coordinator: Laura D. Goodwin

Program Coordinator: Elizabeth B. Kozleski
Office: NC 4023
Telephone: 556-8449, 556-3372, or 556-2717
Faculty: Assistant Professors: Nancy French, Elizabeth B. Kozleski, Deanna J. Sands

CU-Denver offers masters degree and endorsement only Special Education Programs in the areas of Teacher 1 — Students with Mild/Moderate Needs or Teacher 2 — Students with Severe Affective or Cognitive Needs. These programs are designed for individuals planning to work with students from kindergarten through high school. Teachers completing the Teacher 1 program are trained to work with students who have mild to moderate special education needs across all handicapping conditions. Teacher 2 graduates specialize in either the affective or cognitive area in order to work with students with severe needs.

The Special Education Program emphasizes experiential learning experiences. In addition to traditional practicum, course requirements involve the application of information in school and community-based programs. Students choosing this program must be prepared to try out new ideas in their own classrooms or alternatively participate in a variety of field experiences. Some non-traditional practicum experiences are available on a limited basis. Also, students who already have been teaching in the special education field have the opportunity to request a reduction or waiver of their practicum experience. On-the-job practicums are available in coordination with the students administrative unit.

In fall and spring semesters, University courses are offered in the late afternoon and evening. Most courses are held once per week over 16 week semesters. During the summer terms, courses are offered during the day over four or eight week sessions. Some alternative course scheduling is being conducted, so check with your advisor if you are interested.

Program Philosophy

The division faculty at CU-Denver has a strong commitment to the principles of normalization, community integration, the dignity of risk, and the central role that persons with disabilities and their families must play in making choices about their lives and educational experiences. Students are challenged in each course to translate these ideals into reality in the schools. Individuals choosing the CUDenver program will be expected to demonstrate knowledge and competencies in the following areas:

- Cognitive Developmental Approaches to Learning
- Transition Planning for Life-Long Learning
- Community Referenced Curriculum
- Nonaversive Behavior Management
- Integration of Regular and Special Education Services
- Family-School Partnerships
- Ecological Approaches to Assessment Consultation/Collaboration Skills

Endorsement Programs

Students can receive an endorsement in Teacher 1 in 33 hours. Teacher 1 endorsement students must have or be eligible to hold a Colorado teaching certificate prior to admittance into the program. Individuals seeking a Teacher 2 endorsement must attain or already have a master's degree in a field related to special education. While no Colorado teaching certificate is required by the Colorado Department of Education, the faculty of CU-Denver highly recommend obtaining an Elementary or Secondary teaching certificate prior to enrolling in the Teacher 2 program. The endorsement program for Teacher 2 is 36 hours long with 24 hours of prerequisite courses.

Master's Programs

All master's degree students must complete a 9 semester hour educational psychology core in addition to their special education core and practicum experience. In addition to the educational psychology core and the special education core, Teacher 2 candidates must complete 7-12 hours in their specialty for their masters degrees. An additional 24 hours of Teacher Education prerequisites must have been completed either at the graduate or undergraduate level. Comprehensive examinations or a masters thesis are required for all masters students.

9 hours:
REM. 5100. Basic Statistics
REM. 5200. Introduction to Research Methods
EPSY. 5100. Advanced Child Growth and Development or EPSY. 5140. Advanced Adolescent Growth and Development
Teacher 1 Endorsement

Students must already hold or be eligible to hold a Colorado teaching certificate at the elementary or secondary level. Additionally, students must have completed the following 24 hours of prerequisites.

3 hours in each of the following:

- Teaching Mathematics at the Elementary or Secondary Level
- Foundations of Education
- Human Growth and Development
- Instructional Technology
- Models of Teaching
- Introduction to Special Education

6 hours in Teaching Reading and Writing

Students must then complete the following 24 hours of graduate course work:

LC. 5040. Multicultural Education
SPED. 5010. Teaching Strategies with Students with Special Needs
SPED. 5110. Nature and Needs of Students with Mild/Moderate Disabilities
SPED. 5120. Managing the Special Education Teaching Process
SPED. 5140. Advanced Assessment in Special Education
SPED. 5160. Medical and Physical Challenges in the Special Education Classroom
SPED. 5180. Curriculum Planning for Students with Special Needs
SPED. 5300. Consultation Skills for Special Education
SPED. 5400. Seminar in Special Education.

Students in the Severe Needs: Affective area also must complete 7-12 hours in the following courses.

6 hours:

EPSY. 5160. Behavior Disorders
EPSY. 5170. Behavior Analysis and Intervention

1-6 hours of Practicum Experience:

SPED. 5900. Practicum: Students with Mild/Moderate Disabilities

Teacher 2 Endorsement: Severe Needs Affective or Cognitive

Students must have a graduate degree in special education or a related field. It is highly preferred that students also hold or be eligible to hold a Colorado teaching certificate at the elementary or secondary level. Additionally, students must have completed the following 24 hours of prerequisites.

3 hours in each of the following:

- Teaching Mathematics at the Elementary or Secondary Level
- Foundations of Education

Human Growth and Development
- Instructional Technology
- Models of Teaching
- Introduction to Special Education

6 hours in Teaching Reading and Writing

Students must then complete the following 24 hours of graduate course work:

LC. 5040. Multicultural Education
SPED. 5010. Teaching Strategies with Students with Special Needs
SPED. 5120. Managing the Special Education Teaching Process
SPED. 5140. Advanced Assessment in Special Education
SPED. 5160. Medical and Physical Challenges in the Special Education Classroom
SPED. 5180. Curriculum Planning for Students with Special Needs
SPED. 5300. Consultation Skills for Special Education
SPED. 5400. Seminar in Special Education.

Students in the Severe Needs: Affective area also must complete 7-12 hours in the following courses.

6 hours:

EPSY. 5160. Behavior Disorders
EPSY. 5170. Behavior Analysis and Intervention

1-6 hours of Practicum Experience:

SPED. 5911. Practicum: Severe Needs: Affective

Students in the Severe Needs: Cognitive area also must complete 7-12 hours in the following courses.

6 hours:

SPED. 5900. Nature and Needs of Students with Cognitive Disabilities
SPED. 5380. Methods for Students with Severe Cognitive Needs

1-6 hours of Practicum Experience:

SPED. 5912. Practicum: Severe Needs: Cognitive

COURSES

SPED. 5000-3. Education of the Exceptional Child. Introduction to all the major categories of exceptionality. Emphasis is on historical perspectives, legal aspects, definitions of handicapping conditions, major theoretical viewpoints and service delivery models.

SPED. 5010-3. Teaching Strategies for Students with Special Needs. This methods course is offered as a foundation for both special and regular educators in mainstreaming students with special needs. The course provides general strategies for planning and organizing classroom instruction, evaluating instructional materials, managing individualized instruction, and adapting or modifying existing curriculum. Emphasis is placed on needs based model of service delivery.

SPED. 5090-3. Nature and Needs of Students with Cognitive Disabilities. This course focuses specifically on information relevant to the education of persons with cognitive disabilities. Students receive an in-depth analysis of various theories of cognitive development and their application to this population. Cognition is explored with specific reference to information processing models. Prer., SPED. 5010 and 5120.

SPED. 5100-3. Introduction to Language and Learning Disabilities. Introduction to field of learning disabilities. A historical framework and definitional issues will be considered. Most of the course will focus on current research issues of special interest to the practitioner in the field of learning disabilities and related fields.

SPED. 5110-3. Nature and Needs of Students with Mild/Moderate Disabilities. This class introduces students to the cognitive, psychosocial, and psychomotor needs of students with a variety of handicapping conditions. A focus is placed on a needs based model of assessment, program planning, and evaluation. Instructional strategies are evaluated in terms of their impact on varying disabilities. Prer., SPED. 5010, 5120, and educational psychology core, or consent of instructor.

SPED. 5120-3. Managing the Special Education Teaching Process. This class provides a practical format for developing the necessary skills to manage the environmental, behavioral, instructional, and classroom management issues that confront a special educator. Prer., SPED. 5010 or consent of instructor.

SPED. 5140-3. Advanced Assessment in Special Education. This course provides the practitioner with an understanding of the special education assessment process as specified by federal and state guidelines. Students evaluate normed and informal tests as well as observe and participate in performing assessments. Prer., SPED. 5010, 5120, and one of the nature and needs courses, or consent of instructor.

SPED. 5160-3. Medical and Physical Challenges in the Special Education Classroom. This study of the medical aspects and physical needs of exceptional students provides basic information on the types of spinal cord, neurological, and biochemical dysfunctions and their impact.
on students motoric, sensorimotor, cognitive, and affective systems. The course will provide an overview of chronic medical management in the classroom setting. Topics will include hygiene, medication, catheterization, postural drainage, protheses, adaptations and devices, feeding/eating, handling, lifting, and positioning.

SPED. 5180-3. Curriculum Planning for Students with Special Needs. This course is designed to give teachers a framework for providing functional learning experiences in the domains of education, community access, employment, independent living, and social/recreational skills for students in special education. Emphasis is placed on creating, implementing, and evaluating educational placements for subsequent environments. Prereq., SPED. 5010, 5120, or consent of instructor.


SPED. 5300-3. Consultation Skills for Special Education. Consultation skills are vital for special educators working to integrate successfully special education students. This course focuses on the development of competencies in consultation and collaboration. Prereq., SPED. 5010, 5120, and 5180 or consent of instructor.

SPED. 5320-3. The Uses of Technology in Special Education. Specifically designed for the special educator, this course addresses the uses of computers with students in special education. Issues in augmentative communication, adaptation of software authoring systems, and the adaptive firmware level are covered.

SPED. 5380-3. Methods for Students with Severe Cognitive Needs. This is an application level class designed to give teachers the instructional skills they need to provide quality services to students with cognitive disabilities. Prereq., SPED. 5090 and completion of the special education core, or consent of instructor.

SPED. 5400-3. Seminar in Special Education. This course is designed to allow an opportunity for special educators to compare and contrast the service delivery, funding mechanisms, professional ethics, and underlying assumptions of special and regular education. Trends in the field of special education are examined through review of current research. Prereq., SPED. 5010, 5020, 5110, 5140, 5180, and 5300, or consent of instructor.

SPED. 5800-1 to 4. Workshop: Topics in Special Education.

SPED. 5910-1 to 6. Practicum: Students with Mild/Moderate Needs. Students will complete a 12 week (360 hour) practicum under the direct supervision of a special education teacher with certification as a Teacher 1 or for educationally handicapped students. The practicum will be split between elementary and secondary levels. Students will meet with their University supervisor at least 6 times during the course of the practicum experience. Prereq. completion of special education core or consent of instructor.

SPED. 5911-1 to 6. Practicum: Students with Affective Needs. Students will complete a 12 week (360 hour) practicum under the direct supervision of a special education teacher with certification as a Teacher 2: Affective Needs or for educationally handicapped students. The practicum will be split between elementary and secondary levels. Students will meet with their University supervisor at least 6 times during the course of the practicum experience. Prereq. completion of special education core or consent of instructor.

SPED. 5912-1 to 6. Practicum: Students with Severe Cognitive Needs. Students will complete a 12 week (360 hour) practicum under the direct supervision of a special education teacher with certification as a Teacher 2: Cognitive Needs or for educationally mentally retarded students. The practicum will be split between elementary and secondary levels. Students will meet with their University supervisor at least 6 times during the course of the practicum experience. Prereq. completion of special education core or consent of instructor.

SPED. 5913-1 to 6. Practicum: Students with Communication Needs.


Independent Study

SPED. 5840-1 to 4. Independent Study in Special Education.
The College of Engineering and Applied Science at the University of Colorado at Denver, continuing a sixty-year tradition, is meeting the needs of the Denver metropolitan area by providing nationally accredited engineering education to the urban community at times (evening and daytime) convenient to both students and employers.

CU-Denver is the only institution in the Denver metropolitan area where the working individual can earn both undergraduate and graduate degrees in engineering entirely through evening studies. The College offers degree programs in civil engineering, mechanical engineering, applied mathematics, electrical engineering, and computer science and engineering. The programs are attractive to those students who recognize the tremendous value of simultaneous professional studies and related employment. The urban setting also attracts those students who, for economic reasons, are living at home while they earn their degrees.

Practicing engineers, through evening studies at CU-Denver, can improve and update their professional capabilities as well as earn graduate degrees in the above programs. Technical updating, with or without pursuing an advanced degree, becomes more and more critical each year for changing job responsibilities and future opportunities.

Engineers also can obtain graduate education in management, computer science, behavioral science, or other areas, together with new engineering skills in their field through the special interdisciplinary Master of Engineering degree program. In addition, an interdisciplinary Master of Science in environmental science is offered.

The expertise of the faculty of the College includes soil dynamics, dynamic behavior of structures, transportation, language-based computer architecture, highly parallel computer systems, communications and signal processing, computer graphics, computer-aided design, alternative energy sources, robotics, and bio-mechanics, in addition to the traditional areas in civil, electrical, computer, and mechanical engineering.

The College is pleased to host the executive offices of the Colorado Minority Engineering Association (CMEA). The College is committed to supporting this state-wide CMEA program which is designed to help prepare minorities and women in local junior and senior high schools for entry into university engineering programs.

A listing of the fields in which engineers work would have many hundreds of entries. The following list gives only a brief summary of the fields available at CU-Denver.

Applied mathematics meets the need of modern research which is dependent upon advanced mathematical concepts. Almost all concerns that are engaged in industrial and scientific research today need applied mathematicians, as do organizations involved in computational work, statistical analysis, or stochastic.

Civil engineering offers an interesting and challenging career in the design and construction of buildings, bridges, dams, aqueducts, and other structures; in transportation systems including highways, canals, pipelines, airports, rapid transit lines, railroads, and harbor facilities; in the transmission of water and the regulation of rivers; in the development of water resources for urban use, industry, and land reclamation; in the control of water quality through water purification and proper waste treatment; in the construction and contracting industry; and in the problems concerned with mankind's physical environment and the growth of cities.

Computer science and engineering involves work in the theory, design, and application of computers and computational methods. It includes design and construction of efficient software systems as well as hardware design and manufacture. The application of microprocessors to many areas of engineering has opened new opportunities in computer engineering and computer science.

Electrical engineering offers professional possibilities that include teaching and research in a university; research in development of new electrical or electronic devices, instruments, or products; design of equipment or systems; production and quality-control of electrical products for private industry or government; and sales or management for a private firm or branch of government. There are numerous specialties within electrical engineering. Among them are the design and application of computer systems; electron magnetic fields; communication theory and signal processing; electrical science.
machinery; solid-state, integrated circuits, and electron devices; energy and power control systems; and others.

Mechanical engineering offers a wide range of interesting and challenging career opportunities. Almost every company, government agency, or organization that designs and/or manufactures a product or processes materials, employs mechanical engineers. Mechanical engineers may work in research, design, development, manufacturing, testing, and marketing for either private industry or government. They may work on a wide range of products. Among them are engines, transmissions, compressors, pumps, computer disk drives, CAD/CAE software, oil field drilling rigs, missiles, space satellites, earth moving equipment, container manufacturing machines, medical equipment, and many other products encountered in daily life.

Undergraduate Degree Programs

The College of Engineering at the University of Colorado at Denver offers the following engineering bachelor of science degree programs.

- Applied Mathematics
- Civil Engineering
- Computer Science and Engineering
- Electrical Engineering
- Mechanical Engineering

The civil, electrical, and mechanical engineering programs are currently accredited by the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET).

Availability of Degree Programs

The University of Colorado at Denver will accept for matriculation only those prospective engineering students who designate a degree program awarded by the CU-Denver College of Engineering and Applied Science. For 1990-91, the following engineering degrees are awarded by CU-Denver: civil engineering, computer science and engineering, mechanical engineering, electrical engineering, and applied mathematics. Students desiring degree programs other than those named above must apply to the campus awarding the degree. In some cases, the University campus accepting the student may grant permission to take courses on another CU campus, subject to enrollment limitations. In such cases, the engineering department of the admitting campus will counsel the student in the preparation of course schedules.

At CU-Denver it is also possible for a student to obtain a bachelor's degree in engineering and a bachelor's degree in business in five years plus one or two summer terms. Any of the engineering degree programs can be modified for an excellent premedical program. Students interested in combinations of degree programs, or any other variation of a typical degree program, should see a counselor promptly upon acceptance into the college. Such programs usually require students to begin their degree plans very early.

A second bachelor's degree may be of interest to some students. If liberal arts students elect certain courses in science, mathematics, and engineering as undergraduates, they may earn an engineering degree in four semesters after graduation from the College of Liberal Arts and Sciences.

Graduate Degree Programs

CU-Denver offers graduate degree programs in civil engineering, electrical engineering, and mechanical engineering. Information on courses and requirements is found under the discipline heading in this section of the catalog.

Summer Courses

Summer term courses are offered for regular students and those who must clear deficiencies. Courses also are offered for high school graduates who wish to enter as freshmen and for those who need to remove subject deficiencies. Students should write to the CU-Denver Office of Admissions and Records for the Schedule of Summer Classes.

For some students there are advantages in starting their college careers during the summer term. Most required freshman and sophomore courses and many elective courses are offered at CU-Denver during the summer. The summer term gives students a head start and enables them to take a lighter load during the fall semester or take additional courses to enrich their program.

Computing

The College of Engineering and Applied Science encourages all students to develop their skills in using the computer as a tool, not only for solving technical problems but for use in all other facets of their career. The students are encouraged to explore computer courses other than the fundamental programming course required in their curriculum. Examples are CSC 1950, Computer Mind Tools, and courses in other languages, such as "C" and/or "ADA."

Cooperative Education

Many students who need or prefer to work while completing their degrees are exploring cooperative education offered through full-time work with semesters of full-time school, or work part time year around. Many co-op positions lead to permanent career appointments upon graduation.

This program is available to students who have completed their freshman year and have maintained a grade-point average of at least 2.5. See the Center for Internships and Cooperative Education section in this catalog for further information on this expanding program.

Scholarships, Fellowships, and Loan Funds

The College receives an annual allocation of state funds for Dean's Scholarships; these funds are awarded to students who apply and meet scholarship and community service criteria. Limited additional funds for scholarships and loans are obtained through contributions from alumni and friends to the University Development Foundation. Applications for all these funds are accepted beginning with the fall semester each year; awards are usually made in December. For more information, contact the dean's office, NC 3024.

Student Organizations

A general student organization, known as the Associated Engineering Students (AES), of which all students in the College are members, has supervision of matters of interest to the whole group. Student chapters of the following professional societies are well established at CU-Denver:

- American Society of Civil Engineers (ASCE)
- American Society of Mechanical Engineers (ASME)
- Institute of Electrical and Electronic Engineers (IEEE)
- National Society of Black Engineers (NSBE)
- Society of Hispanic Professional Engineers and Scientists (SHPES)
- Society of Women Engineers (SWE)
These societies meet frequently to present papers, speakers, films, and other programs of technical interest.

The following honorary engineering societies have active student chapters in the College of Engineering and Applied Science:

*Chi Epsilon*, civil and architectural fraternity
*Eta Kappa Nu*, electrical engineering society
*Pi Tau Sigma*, mechanical engineering society
*Tau Beta Pi*, engineering society

Center for Urban Transportation Studies

The Center for Urban Transportation Studies (CUTS), operating under the Department of Civil Engineering, was established (1) to assume a leading role in the Rocky Mountain region in developing research, research facilities, and interdisciplinary graduate programs in urban transportation; and (2) to provide a central resource for information concerning urban transportation problems in the Rocky Mountain region, making available to outside organizations the expertise within the University.

Through CUTS, the departments offer interdisciplinary graduate programs and research opportunities designed to develop professionals who will be capable of dealing with the complex problems of urban transportation in a competent and meaningful manner. Degree programs are available through the College of Engineering and Applied Science, College of Liberal Arts and Sciences, Graduate School of Public Affairs, Graduate School of Business Administration, and School of Architecture and Planning. For more information call (303) 556-2871, or write to CUTS, University of Colorado at Denver, 1200 Larimer St., Campus Box 113, Denver, CO 80204.

OTHER UNIVERSITY CAMPUSES

University of Colorado at Boulder

Six departments of the College of Engineering and Applied Science are located on the campus of the University of Colorado at Boulder. Complete B.S., M.S., and Ph.D. degree programs are offered by the Department of Aerospace Engineering Sciences, the Department of Chemical Engineering, the Department of Civil, Environmental and Architectural Engineering, the Department of Computer Science, the Department of Electrical and Computer Engineering, and the Department of Mechanical Engineering.

Undergraduate and graduate degrees also are offered in applied mathematics and engineering physics. The programs at the Boulder campus are primarily oriented to the full-time student who can attend day classes.

University of Colorado at Colorado Springs

Three departments of the College of Engineering are located on the campus of the University of Colorado at Colorado Springs (UCCS). Complete B.S. degree programs are offered in electrical engineering and computer science, and the M.S. degree is awarded in electrical engineering. Students may complete work for the Ph.D. degree through the University-wide Graduate School. The UCCS Department of Mathematics also is a department of the College of Engineering and offers the B.S. and M.S. degrees in applied mathematics.

**REQUIREMENTS FOR ADMISSION**

The student must meet the admission requirements described in the General Information section of this catalog and of the College of Engineering at which the degree program selected by the student is offered. Persons of sufficient maturity and experience who do not meet the prescribed requirements for admission may be admitted upon approval of the dean.

Beginning students in engineering should be prepared to start analytic geometry-calculus. No credit toward any degree in engineering will be given for algebra, trigonometry, or precalculus mathematics (MATH 1110, 1120, and 1130), but these courses will be offered to allow a student to make up deficiencies. Students who question the adequacy of their pre-college background in mathematics should contact the Department of Mathematics office. Placement tests covering precalculus mathematics are required of new freshmen to select the appropriate beginning mathematics course.

To be prepared for the type of mathematics courses that will be taught, the student must be competent in the basic ideas and skills of ordinary algebra, geometry, and plane trigonometry. These include such topics as the fundamental operations with algebraic expressions, exponents and radicals, fractions, simple factoring, solution of linear and quadratic equations, graphical representation, simple systems of equations, complex numbers, the binomial theorem, arithmetic and geometric progressions, logarithms, the trigonometric functions and their use in triangle solving and simple applications, and the standard theorems of geometry, including some solid geometry. It is estimated that it will usually take eight semesters to cover this material adequately in high school.

Freshmen

**High School Subjects**

<table>
<thead>
<tr>
<th>Required for Admission</th>
<th>Required Units²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Effective Fall 1988</strong></td>
<td></td>
</tr>
<tr>
<td>English (literature, composition, grammar)</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics distributed as follows:</td>
<td></td>
</tr>
<tr>
<td>Algebra</td>
<td>2</td>
</tr>
<tr>
<td>Geometry</td>
<td>1</td>
</tr>
<tr>
<td>Trigonometry and Analytical Geometry</td>
<td>1</td>
</tr>
<tr>
<td>Natural sciences</td>
<td>3</td>
</tr>
<tr>
<td>(to include 1 unit physics and 1 unit chemistry; also to include 2 units of laboratory science)</td>
<td></td>
</tr>
<tr>
<td>Foreign language</td>
<td>2</td>
</tr>
<tr>
<td>Social science</td>
<td>2</td>
</tr>
<tr>
<td>(to include 1 unit of U.S. or world history)</td>
<td></td>
</tr>
<tr>
<td>Electives³</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
</tr>
</tbody>
</table>

Former Students

Former students must meet the readmission requirements outlined in the General Information section of this catalog.

Students who interrupt their degree program for an extended period will be required to follow the degree program in effect at the time of their readmission to the College. If repetition of course work is necessary because of the interruption, the

³Applicants not meeting these requirements will be considered on an individual basis. A student who is not prepared should expect to make up deficiencies.

²A unit of work in high school is defined as a course covering a school year of not fewer than 36 weeks, with five periods of at least 40 minutes per week. Two periods of manual training, domestic science, drawing, or laboratory work are equivalent to one period of classroom work. This is equivalent to 180 actual periods per unit. Fractional credits of value less than one-half unit will not be accepted. Not less than one unit of work will be accepted in a foreign language, elementary algebra, geometry, physics, chemistry, or biology.

³Electives may be chosen from any of the high school subjects (except physical education) which are accepted by an accredited school for its diploma and which meet the standards as defined by the North Central Association.
repeated courses must be taken for no-credit (NC). See the Repetition of Courses policy under Academic Policies in this section of the catalog.

Transfer Students

Students transferring from other accredited collegiate institutions will be considered for admission on an individual basis if they meet the requirements outlined in the General Information section of this catalog and have successfully completed a year each of calculus and physics (calculus based).

Intrauniversity transfers, within the same campus of the University, to the College of Engineering and Applied Science will be considered on an individual basis if both of the following conditions are fulfilled:
1. Enrollment limitations permit.
2. The student's prior academic record includes successful completion of a year each of calculus and physics (calculus based).

Intercampus transfers of students from one campus of the University to another will be considered on an individual basis if the following conditions are fulfilled:
1. Enrollment limitations permit.
2. The student has a minimum of 30 hours toward an engineering curriculum at that campus, not counting transfer hours.
3. If an engineering student, the student is in good academic standing with at least 2.0 cumulative grade-point average for all courses attempted, for all courses taken from the student's major department, and for all courses that count toward graduation requirements. If not an engineering student, the student's academic record fulfills the transfer admission requirements of the College of Engineering and Applied Science.

Intersessional transfers, whether on the same campus or from one campus to another within the College of Engineering, require the approval of both the gaining and losing departments in addition to the intercampus and intrauniversity transfer requirements listed above.

Some course sequences should be completed before transferring to another campus; therefore, it is strongly recommended that students who contemplate transferring campuses see their department advisors on both campuses prior to initiating the transfer request.

Both intrauniversity and intercampus transfers are subject to review by a faculty committee which evaluates the applicant's qualifications for academic success in engineering subjects.

TRANSFER CREDIT

Refer to the General Information section of this catalog for descriptions of University-wide policies on transfer credit. After a prospective transfer student has made application and submitted official transcripts to the University of Colorado, Office of Admissions and Records, that office issues an Applicant Transfer Credit Evaluation listing those courses that are acceptable by University standards for transfer. A copy of this evaluation is sent to the student and to the dean's office by the Office of Admissions and Records and is made a part of the permanent record.

A specified engineering faculty department transfer advisor will use this form to indicate which courses and credit hours listed are acceptable toward the 128-hour graduation requirement for the student's degree program. The decisions will be recorded on both the Applicant Transfer Credit Evaluation form and the department's Study Program for B.S. form and signed and dated. Both forms are reviewed by the dean's office and signed and dated. Any modification to the initial evaluation must be by petition, have the recommendation of the transfer advisor and department chair, and have approval of the dean's office. All documents will become a part of the student's master file in the dean's office. All transfer credit must be validated by satisfactory achievement in subsequent courses.

NONTRANSFERABLE CREDITS

The following guidelines have been established for students desiring to transfer credits from engineering technology programs.

Courses on basic subjects such as mathematics, physics, literature, or history may be acceptable for direct transfer or credit if they were taught as part of an accredited program for all students and were not specifically designated for technology students.

Students who have taken technology courses (courses with technology designations) that may be valid equivalents for engineering courses have these options:
1. They may petition faculty advisors to waive the requirement for the course. The requirement for a course can be waived if students demonstrate that, by previous course work, individual study, or work experience, they have acquired the background and training normally provided by the course. No credit is given toward graduation for a waived course, but students may benefit from the waiver by being able to include more advanced work later in their curriculum. Other students may profit by taking the course at this College instead and thus establish a fully sound basis for what follows.
2. Students may seek credit for the course by examination.

UNDERGRADUATE CORE CURRICULUM — UNIVERSITY OF COLORADO AT DENVER

The faculty of the College of Business Administration, College of Engineering and Applied Science, and the College of Liberal Arts and Sciences have established a new core curriculum for undergraduate students. Beginning with the Fall 1990 Semester, all undergraduate students entering CU-Denver will be required to complete the undergraduate core curriculum independent of their college or major. Undergraduate students admitted prior to Fall 1990 will have a choice of either the new core curriculum or the requirements of their college in effect at the time of admission to the college.

The new undergraduate core curriculum seeks to provide all baccalaureate students with basic intellectual competencies in mathematics and computation, writing, oral communication, information literacy, and critical thinking. It also requires all students to come to terms with the basic knowledge areas of the natural and physical sciences, behavioral sciences, social sciences, humanities, and arts. Furthermore, the core curriculum promotes an awareness of cultural and racial diversity. The majority of the new core curriculum is designed to be completed during a student's freshman and sophomore years in order to provide the foundation for specific training in a student's major discipline.

The new undergraduate core curriculum for CU-Denver is outlined in the table below. Each college may augment the campus core curriculum. For example, the College of Liberal Arts and Sciences may require competency in a foreign language for the Bachelor of Arts degree. Additionally, a student's major may change the course requirements directly associated with a specific major. For example, engineers may have different core courses in the natural and physical sciences area.

Details concerning the core curriculum will be available in the advising office for each college by the beginning of the Fall 1990 Semester. Students should contact their college advising office for core requirements specific to their college and for a list of courses designed to satisfy core requirements.
CU-Denver Undergraduate Core Curriculum

1. Intellectual Competencies
   a. Writing/Speech 9 hours 6-9 hours in English with library component, 3-0 hours in Communication
   b. Mathematics 3 hours any computation course or by examination

2. Knowledge Areas
   a. Natural and Physical Sciences 8 hours two courses with laboratory, in one or two disciplines
   Biology, Chemistry, Geology, and Physics
   Behavioral Sciences AND Social Sciences 9 hours minimum one course in Behavioral and Social, maximum two in a discipline
   b. Behavioral Sciences 3-6 hours one or two courses in one or two disciplines
   Anthropology, Communication, and Psychology
   c. Social Sciences 3-6 hours one or two courses in one or two disciplines
   Economics, Geography, Political Science, and Sociology
   d. Humanities 6 hours two courses in one or two disciplines
   History, Languages, Literature, and Philosophy
   e. Arts 3 hours
   Fine Arts, Music, and Theatre
   f. Multicultural Diversity 3 hours one upper division course from approved list

ACADEMIC POLICIES

Refer to the General Information section of this catalog for descriptions of University-wide policies.

The following policies apply specifically to the College of Engineering and Applied Science.

Advanced Placement

Advanced placement credit may be granted by special examination of the department involved or by College Entrance Examination Board (CEEB) tests. If the applicant has scored 3, 4, or 5 on the CEEB Advanced Placement Examination, credit toward graduation may be awarded. Students who have scored 3 may be considered for advanced placement by the department concerned. All advanced placement and transfer credit must be validated by satisfactory achievement in subsequent courses, in accordance with standard transfer policies of the College.

Attendance Regulations

Successful work in the College of Engineering and Applied Science is dependent upon regular attendance in all classes. Students who are unavoidably absent should make arrangements with instructors to make up the work missed. Students who, for illness or other good reason, miss a final examination must notify the instructor or the dean’s office no later than the end of the day on which the examination is given. Failure to do so will result in an F in the course.

Changing Departments

Students who wish to change to another department within the College of Engineering and Applied Science must apply for transfer by submitting a Change of Major for Undergraduate Degree Students form which must have the approval of both departments concerned. (See also discussion of interdepartmental transfer requirements under Transfer Students.)
College-Level Examination (CLEP) Credit

Prospective students may earn college-level credit through the College-Level Examination Program (CLEP) subject examinations, provided that they score at the 67th percentile or above. The department's transfer advisor will advise students of the credits accepted for such courses toward a degree program. A list of subjects in which CLEP examination credit will be accepted may be obtained from the College of Engineering and Applied Science office. (See also College Level Examination Program in the General Information section of this catalog.) (CLEP general examinations are not acceptable.)

Counseling

Freshman students are counseled by the dean's office and by representatives from each academic department. These representatives are readily available to assist students with academic, vocational, or personal concerns.

Students are assigned specific departmental advisers for academic planning and should contact the departmental office for advising appointments.

Course Load Policy

Full-time Students. Undergraduate students employed less than 10 hours per week should register for the regular work as outlined in the departmental curricula. Additional courses may be allowed when there is satisfactory evidence that the student has the capability to handle the added load. Permission to take more than 21 hours may be granted only after written petition and approval of the departmental chairman and the dean.

Employed Students. Suggested maximum course loads for undergraduate students employed 10 or more hours per week are as follows:

- Employed 40 or more hours per week — two courses
  (maximum of 9 semester hours)
- Employed 30 hours per week — three courses
  (maximum of 12 semester hours)
- Employed 20 hours per week — four courses
  (maximum of 15 semester hours)
- Employed 10 hours per week — five courses
  (maximum of 18 semester hours)

Freshman Year

Fundamentals taught in the freshman year are of critical importance in the more advanced classes, and every effort is made to register a beginning freshman in the proper courses. (Course requirements for freshmen are detailed within the curriculum given under each department.)

All freshmen are urged to consult their instructors whenever they need help in their assignments.

Repetition of Courses

Students are expected to successfully complete (C or higher) their courses in a timely manner (first attempt). Students may not register for credit in a course in which they already have received a grade of C or higher. Students must repeat a course in which a grade of D+ or lower was earned if that course is a prerequisite to another required course. An F grade in a required course necessitates a subsequent satisfactory completion of the course. If students do not successfully complete (i.e. receive a grade of C or higher) an engineering class on the second attempt, they must obtain written approval from their major department to enroll for the course for the third time.

No Credit

An engineering student must petition for approval before enrolling no credit (NC) for any course. Required courses may not be taken for no credit. Once a course has been taken NC, the course cannot be repeated for credit.

Work Experience

It is the policy of the College of Engineering and Applied Science that any credits accrued in the official records of the student that were awarded for work experience will not apply as part of the hours required for an engineering degree.

College Policy on Academic Progress

An engineering student must maintain a cumulative grade-point average of 2.0 or better, in all hours attempted at the University of Colorado, in those courses required toward graduation requirements, and in all courses taken from the student's major department in order to remain in good standing in the College of Engineering and Applied Science. Grades earned at another institution are not used in calculating the grade point average at the University of Colorado. However, grades earned in another school or college within the University of Colorado will be used in determining the student's scholastic standing and progress or lack of progress toward the Bachelor of Science degree in the College of Engineering and Applied Science.

Students whose average falls below 2.0 in any of the three categories listed above will be placed on probation for the next semester in which they are enrolled in the College and will be so notified. If, after the probationary semester the student's average is still below 2.0, the student will be suspended from the College.

The following is additional information and interpretation of the policy:

1. Students are suspended indefinitely and may not enroll at any University of Colorado campus during any regular academic year, September through May, but may enroll in summer terms and/or may take correspondence courses for credit through the Division of Extended Studies.

2. Students who have been suspended may apply for readmission if they bring their University of Colorado cumulative average up to a 2.0 through summer term, and/or correspondence work applying to engineering degree requirements. Students, upon satisfactorily completing at another college or university a minimum of 12 semester hours of acceptable work appropriate to an engineering curriculum subsequent to suspension, may apply for readmission as a transfer student during the second semester following their suspension.

3. Students, upon satisfactorily completing at another college or university a minimum of 12 semester hours of acceptable work appropriate to an engineering curriculum subsequent to suspension, may apply for readmission as a transfer student during the second semester following their suspension.

4. Applicants for readmission to the University of Colorado cannot be assured readmission.

5. During a probation semester the student must complete a normal load, i.e., 12 hours or more (see employed student suggested course load) of courses counting toward graduation requirements. Physical education courses do not count; if the student has previously completed 6 hours of ROTC courses, ROTC courses do not count; if the required hours of humanities and social science subjects have been completed, such subjects do not count.

6. Students who have been on probation or suspension at any time in the past will automatically be suspended if their overall average again falls below 2.0. (No additional probationary semester is permitted.)

Details of the probationary and suspension status and of the conditions for return to good academic standing will be stipulated in the letters of probation and suspension. Information regarding these matters may be obtained in the Office of the Dean, NC 3020.
In addition to College policies, departments within the College may set standards of progress within their department and students should make a point of knowing them.

Academic Ethics (Dishonesty, Cheating)

Students are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Cheating, plagiarism, illegitimate possession and disposition of examination, alteration, forgery, or falsification of official records, and similar acts or attempts to engage in such acts are grounds for suspension or expulsion from the University.

In particular, students are advised that plagiarism consists of any act involving the offering of the work of someone else as the student's own. It is recommended that students consult with their instructors as to the proper preparation of reports, papers, etc., in order to avoid this and similar offenses.

At CU-Denver there is a Student Academic Honor Code. The code is published in a brochure available from the Student Enrollment and Services office. Information regarding all student grievance procedures may be obtained in that office, NC 2204.

In addition, the College has a Committee on Discipline which hears cases of alleged violations of academic ethics and recommends disciplinary action when and if appropriate. Students who suspect or observe violations of academic ethics should report them to their instructor, the department chairman, or the Office of the Dean.

Grading System, Incompletes, Pass/Fail and Drop/Add Procedures

See the General Information section of this catalog for the University of Colorado uniform grading system and for additional pass/fail information and drop/add procedures. Also see the current Schedule of Classes.

GRADING SYSTEM

It is particularly important to note that in the College of Engineering and Applied Science courses to be counted toward fulfilling the graduation requirements cannot be taken no credit (NC).

Final grades as reported by instructors are to be considered permanent and final. Grade changes will be considered only in cases of documented clerical error and must be approved by the dean.

INCOMPLETES

An incomplete may be given by the instructor for circumstances beyond the student's control, such as a documented medical or personal emergency. When it is given, the student, the dean's office, and the departmental office are informed, in writing, by the instructor who states what the student is to do in order to remove the incomplete and the date the tasks are to be completed. The instructor may assign only the I/F grade. The student is expected to complete the course requirements, e.g., the final examination or term paper, within the established deadline and not to retake the entire course. The grade will be converted automatically to a grade of F after one year unless the specified work is completed.

PASS/FAIL

The primary purpose for offering courses on a pass/fail grade basis is to encourage students, especially juniors and seniors, to broaden their educational experience by electing challenging upper division humanities and social sciences elective courses without serious risk to their academic records. In general, pass/fail should be limited to 3000- or 4000-level humanities and social sciences courses. Students must process the pass/fail form during the first two weeks of the semester. Engineering students cannot take required courses pass/fail. Below are specific pass/fail regulations for the College of Engineering and Applied Science:

1. A maximum of 16 pass/fail hours may be included in a student's total program. A maximum of 6 hours may be taken in one semester, but it is recommended that not more than one course at a time be taken pass/fail.
2. Courses that a student may elect to take pass/fail shall be designated and approved in advance by the student's major department. If courses not so designated are taken, the earned grade will be recorded in place of the P. An engineering student who has not designated a major field will not be allowed the pass/fail option without approval through the dean's office.
3. A transfer student may count toward graduation one credit hour of pass/fail for each 9 credit hours completed in the College; however, the maximum number of pass/fail hours counting toward graduation shall not exceed 16, including courses taken in the Honors Program under that program's pass/fail grading system.

DROP/ADD

See the General Information section of this catalog for drop/add procedures and deadlines. Only under very extenuating circumstances will petitions for dropping courses be considered after the tenth week of the semester.

Sequence of Courses

Full-time students should complete the courses in the department in which they are registered according to the typical curriculum shown under their major department in this catalog. Part-time students should modify the order of courses with advisor approval.

The course requirements during the freshman year are detailed within the curriculum given under each department.

Some of the sophomore year is common to all, and the remainder of the courses begin to point to the various fields of engineering; real specialization begins, however, in the junior year and carries on through the senior year. A fifth year of study leading to the master's degree is strongly urged for qualified students of more than usual ability who feel they can profit from additional study.

Students who receive a grade of D+ or lower in a course that is prerequisite to another may not register for the succeeding course unless they have written permission of both the department and the instructor of the succeeding course. If written permission is not in the student's file, the course will not apply to the hours required for an engineering degree.

Students may enroll for as much as 50 percent of their courses in work that is not a part of the prescribed curricula of the College of Engineering and Applied Science, provided they have at least a 2.0 grade average in all college work attempted. Exceptions to this policy may be made by petition and may be made for students admitted to double degree programs.

Graduation with Honors

In recognition of high scholarship and professional attainments, Honors, Special Honors, or With Distinction may be awarded at graduation (at the discretion of the student's major department). These honors are recorded on the diploma of the graduate and indicated in the commencement program. Grades earned during the semester of graduation will not be considered.

For Special Honors, a student must have a cumulative grade-point average of
at least 3.80 and for Honors an average between 3.60 and 3.79. With Distinction is awarded at the discretion of the committee.

Transfer students to be considered for honors will be expected to complete a minimum of one-half of their work at the University of Colorado. Grades earned at other institutions will not be considered. Transfer students must have completed at least 50 hours at CU before their last semester and must have a minimum of 64 hours completed at graduation.

Humanities and Social Sciences Component of the Engineering Curriculum

The intent of the humanities and social sciences (HSS) component of an engineering program is to provide the student with a coherent and well-structured exploration of a substantive issue or theme appropriate to the engineering profession and/or of interest to the student from the disciplines within the social sciences, humanities, and fine arts areas. This component of the engineering program should be planned in consultation with an engineering faculty advisor to be sure that all College and departmental requirements are satisfied.

The faculty of the College of Engineering and Applied Science requires that 18 semester hours shall be considered the minimum of humanities and social sciences content of the degree-granting departments. However, some departments may require more than 18 hours and some departments specify particular courses that must be taken.

The 18 hours of required humanities and social sciences electives must include both breadth and depth, must include advanced level course work, and should be planned in consultation with the advisor from a list of humanities and social sciences courses approved by and available from the major department. A random selection of lower division courses will not satisfy the humanities and social sciences elective requirement.

The humanities and social sciences courses are taken from the following disciplines:

- Literature, Philosophy, and Humanities
- Anthropology, Economics, History
- Political Science, and Sociology
- Fine Arts and Music (critical or historical)
- Courses such as accounting, contracts, management, elementary foreign languages, public speaking, and technical writing are not acceptable as humanities and social sciences electives, but with prior departmental approval may be used as technical electives.

PLANNING AN ENGINEERING PROGRAM

- It is the responsibility of all students:
  - to plan and be sure they fulfill all the requirements of their degree program;
  - to set up an appointment with their department transfer credit advisor if appropriate;
  - to set up an appointment with their department senior check-out advisor prior to their last 30 hours of course work to formalize a graduation contract that will be reviewed by the dean's office;
  - to fill out an Application for Diploma card during the first two weeks of their last semester; and
  - to keep their senior check-out advisor informed of any changes in the student's plans throughout their last year.

In order to become eligible for one of the bachelor's degrees in the College of Engineering and Applied Science, a student, in addition to being in good standing in the University, must meet the following minimum requirements:

Courses. The satisfactory completion of the prescribed and elective work in any curriculum as determined by the appropriate department.

Hours. A minimum of 128 hours, of which the last 30 shall be earned after matriculation and admission as a degree student in the College of Engineering and Applied Science at CU is required for students in the four-year curriculum; however, many students may need to present more than the minimum hours because of certain departmental requirements and because they may have enrolled in courses which do not carry full credit toward a degree. The hours required for students in any double degree program may vary by department; as a guide, 158 semester hours are considered a minimum, but most students follow programs that bring the total above this figure.

Grade Average. A minimum grade-point average of 2.0 (C) for all courses attempted, for all required courses, and for all courses taken from the student's major department. A department may require a minimum of C in all major courses.

Faculty Recommendation. The recommendation of the faculty of the department offering the degree and the approval of the faculty of the College of Engineering and Applied Science.

Incompletes and Correspondence Courses. It is the student's responsibility to ensure that all incompletes and correspondence courses are officially completed before the tenth week of the student's final semester in school.

Simultaneous Conferring of Degrees. For any double degree program, both bachelor's degrees must be conferred at the same commencement.

Commencement Exercises. Commencement exercises are held in May. Students finishing in December and August are encouraged to attend commencement the following May but may request diplomas be mailed.

UNDERGRADUATE DEGREES

In addition to the standard four-year degree programs previously listed, the College is involved in double degree programs.

Business and Engineering

Undergraduates in the College of Engineering and Applied Science with career interests in administration may complete all of the requirements for both a B.S. degree in engineering and a B.S. degree in business administration by extending their study programs to five years, including one or two summer terms. The 42 semester hours of business courses required by the College of Business and Administration may be started in the second, third, or fourth year, depending upon the curriculum plan for the particular field of engineering in which the student is enrolled.

Students taking these undergraduate programs are not required to submit formal application for admission to the College of Business. However, before enrolling in any business courses, the student must have approval from a College of Business advisor.

Requirements for the undergraduate business degree and engineering degree must be completed concurrently. At least a 2.0 grade average must be earned in all courses undertaken in the College of Business. No fewer than 30 semester credits in business courses must be earned to establish residency credit. Courses offered or required by the College of Business may be used in lieu of electives required for undergraduate engineering degrees, subject to the approval of the individual department.

Before deciding upon the business option, a student should carefully consider, in consultation with departmental
advisors, the relative advantages of the B.S. business-B.S. engineering curricula, the degree program of the Graduate School of Business Administration, and the Master of Science or the Master of Engineering degree program in the student's own engineering discipline.

The required non-business courses are listed in the College of Business and Administration section of this catalog. The business course requirements for this program are as follows:

**Required Business Semester Hours Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT. 2000. Introduction to Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ISMG. 2000. Business Information</td>
<td>3</td>
</tr>
<tr>
<td>Systems and the Computer</td>
<td>3</td>
</tr>
<tr>
<td>FNCE. 3300. Basic Finance</td>
<td>3</td>
</tr>
<tr>
<td>MKTG. 3000. Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 3300. Management and Organization Behavior</td>
<td>3</td>
</tr>
<tr>
<td>BLAW. 3000. Business Law</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4110. Business and Society</td>
<td>3</td>
</tr>
<tr>
<td>OPMG. 3000. Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>MGMT. 4500. Business Policy and Strategic Management</td>
<td>3</td>
</tr>
</tbody>
</table>

Twelve (12) hours of specified courses in an area of emphasis in one of the following fields: accounting, finance, human resources management, information systems, international business, management, marketing, operations management, or transportation and distribution management. All course work in the area of emphasis must be taken in the University of Colorado College of Business and Administration. Total: 42

The student should note that for some courses, and for some areas of emphasis, there are prerequisites which must be met. Since some of the courses may be taken as engineering electives, it is possible to obtain the two degrees in as few as 158 semester hours; however, most students will require more.

**Joint Engineering Degrees**

A student may obtain two engineering degrees by meeting the requirements and, by petition, obtaining the approval of both departments concerned and the dean. Thirty hours of elective or required subjects in addition to the largest minimum number required by either of the two departments must be completed. Of the 30 additional hours for the second degree, a minimum of 24 hours, with no fewer than 16 hours of design content, shall be in courses in the department concerned or in courses approved in writing in advance by the department as substitutes.

**Premedicine Option**

A professional school in a field such as medicine requires a student to have a college education prior to pursuing its professional courses. In practically all cases, medical students are university graduates, although occasionally a student may enter medical school after three years of university training. A student can prepare for medical school either in the College of Liberal Arts and Sciences or in the College of Engineering and Applied Science.

The desirability of obtaining an engineering education prior to undertaking a study of medicine is increasing continually, as medicine itself is evolving. A great deal of additional equipment, most of it electronic, is being developed to assist the medical practitioner in treatment of patients. Bio-engineering, engineering systems analysis, probability, and communication theory are highly applicable to medical problems. Improved communication techniques also are allowing the storage and retrieval information not previously available to the medical doctor. An advanced knowledge of basic mathematics and computing techniques, along with increased understanding of physical chemistry, are improving the scientific base upon which medical knowledge rests. It is therefore desirable that the medical practitioner and researcher in the future be well equipped with the tools which engineering can offer.

To provide at least a minimum of the necessary knowledge, the additional courses listed below are prescribed and must be completed with superior grades. General overall requirements for entry into most medical schools are given. Students can meet these requirements by careful substitution of electives in the engineering curriculum. In some cases where additional hours may be required, interested students should consult with the engineering department chairman.

**General chemistry** (CHEM. 2031, 2038, 2061, 2068) 2 sem. (8-10 sem. hrs.)
**Organic chemistry** (CHEM. 3411, 3421, 3418, 3440) 2 sem. (8-10 sem. hrs.)
**General biology** (BIOL. 2051-2061) 2 sem. (8 sem. hrs.)
**English composition** 1 sem. (3 sem. hrs.)
**Literature** 2 sem. (6 sem. hrs.)

To prepare for a career in medicine in the College of Engineering and Applied Science, it is strongly recommended that the student follow a full four-year college program and earn a B.S. degree.

The Admissions Committee of the University of Colorado School of Medicine welcomes inquiries and visits from prospective students, particularly at the time of their first interest in medicine as their chosen profession.

Students desiring to enter a premedicale program should consult the representative of the department involved. At CU-Denver premedical advising is available through the Health Careers Advisor, NC 3411, 556-2689.

**GRADUATE STUDY IN ENGINEERING**

The College of Engineering and Applied Science at CU-Denver offers graduate programs in civil engineering, electrical engineering, and mechanical engineering. Course work toward the M.S. degree in computer science may also be taken at CU-Denver, but the degree is awarded by CU-Boulder.

For information regarding courses and requirements leading to the degrees Master of Science, Master of Engineering, Master of Environmental Science, or to the Ph.D. degree, see the appropriate discipline heading in this section. For graduate admission information and policies see The Graduate School section of this catalog.

**Education for Employed Professional Engineers**

Continuing education for employed engineers grows more important each year. Therefore, the College puts great emphasis upon making graduate courses available through night and televised courses. The Master of Engineering degree permits graduate students more flexibility in defining specialized inter-disciplinary fields that meet their professional needs. This degree has standards full equivalent to those of the Master of Science degree.

In addition to credit course work, the College works jointly with the Division of Extended Studies to offer noncredit courses of interest to practicing engineers.

**Concurrent B.S. and M.S. Degree Program in Engineering**

Students who plan to continue in the Graduate School after completing the requirements for the B.S. degree may apply for admission to the concurrent degree program through their department early in the second semester of their junior year (after completion of at least 80
background requirements as electives in their undergraduate programs. Seniors in engineering who have such intentions and appear likely to qualify for admission to graduate study in business may be permitted to register for graduate fundamentals courses which are designed to provide qualified students with needed background preparation in business. Students must see an advisor from the College of Business for approval.

Programs of Study

Courses listed in the following curricula are typical illustrations only. Changes in specific courses may be necessary to accommodate students' needs and/or changes in institution requirements.

APPLIED MATHEMATICS

Coordinator: Weldon A. Lodwick
Office: DR 620
Telephone: 556-8442

Administrative Officer: Max Morstad
Office: NC 3024
Telephone: 556-2870

The College of Liberal Arts and Sciences offers all courses in mathematics, both required and elective, for undergraduate and graduate students in the College of Engineering and Applied Science. Three curricula leading to the degree B.S. (A. Math.) are offered. In Option I, the student takes an approved minor from a CU-Denver engineering department. In Option II, the student takes distributed course work in engineering departments, including a solid grounding in mechanics, circuits, and materials. Option III is a joint mathematics-computer science program. Regardless of the option chosen, each student is expected to complete a minimum of 45 semester hours of course work in mathematics beginning with MATH 1401.

The undergraduate curriculum is designed to give training in mathematics and in engineering and science. The use of numerical methods and computers is included.

Students should plan a complete program and obtain the approval of a departmental coordinator and the engineering dean's office at the beginning of the sophomore year and before registering for their last 30 hours.

The B.S. degree in applied mathematics requires the completion of a minimum of 128 credit hours of course work with an average grade of C or better (a 2.0 grade-point average) and a grade of C or better in all mathematics courses.

Typical Curriculum for B.S. (Applied Mathematics)

FRESHMAN YEAR

Fall Semester
MATH. 1401. Analytic Geometry and Calculus I. 4
CHEM. 1130. General Chemistry or CHEM. 2031 and 2038. 5
Humanities and social sciences elective (see note 1) 3
CSC. 1410. Fundamentals of Computing (see note 5) 3
Total 15

Spring Semester
MATH. 2411. Analytic Geometry and Calculus II. 4
PHYS. 2311. General Physics I. 4
PHYS. 2321. General Physics Lab I. 1
Humanities and social sciences elective (see note 1) 3
Approved electives (see notes 3 and 4) 5
Total 17

SOPHOMORE YEAR

Fall Semester
MATH. 2421. Analytic Geometry and Calculus III. 4
PHYS. 2331. General Physics II. 4
PHYS. 2341. General Physics Lab II. 1
Humanities and social sciences elective (see note 1) 3
Approved electives (see notes 3 and 4) 8
Total 17

Spring Semester
MATH. 3000. Introduction to Abstract Mathematics 3
MATH. 3191. Applied Linear Algebra 3
Approved electives (see notes 3 and 4) 8
Humanities and social sciences elective (see note 1) 3
Total 17

JUNIOR YEAR

Fall Semester
MATH. 3200. Elementary Differential Equations 3
MATH. 3810 or 4381. Probability Theory 3
ENGR. 3012. Thermodynamics 3
Approved electives (see notes 3 and 4) 8
Total 17

Graduate Work in Business

Undergraduates in engineering who intend to pursue graduate study in business may complete some of the business
**Spring Semester**
- MATH. 4310, Advanced Calculus I
- and/or MATH. 4408, Applied Graph Theory (see note 3) 3
- Approved electives (see notes 3 and 4) 11
- Humanities and social sciences elective (see notes 1 and 2) 3
- Total 17

**SENIOR YEAR**
- Full Semester
  - Approved electives (see notes 3 and 4) 12
  - Humanities and social sciences elective (see notes 1 and 2) 3
  - Total 15

**Notes for B.S. (Applied Mathematics)**
1. Six semester hours of literature are recommended but 18 semester hours of advisor-approved humanities and social sciences electives that provide both breadth and depth from the areas of humanities, social sciences, and fine arts are required. A random selection of introductory courses will not satisfy the requirement.
2. Students may take upper division humanities and social sciences electives pass/fail, subject to the regulations of the College of Engineering and Applied Science.
3. A minimum of 45 semester hours of course work in mathematics is recommended beginning with MATH. 1401. Students considering an advanced degree should definitely take both MATH. 4310 and 4320, Advanced Calculus I and II. A two-semester sequence from either MATH. 4408-4409, or MATH. 4650-4660, or MATH. 4576-4577 is required for option 3. One or both of the following courses is strongly recommended for all options: MATH. 4791, Math Modeling, or MATH. 4779, Math Clinic.
4. In addition to CSC. 1410, ENGR. 1025 and 3012, the student must take a minimum of 18 hours of approved engineering or computer science courses excluding chemistry, mathematics, and physics courses. Furthermore, the student who does not have a strong interest in applications of mathematics to engineering is encouraged to consider a major in mathematics in the College of Liberal Arts and Sciences.
5. Students in either Option 1 or 2 may take CSC. 1100 or 1410; however, any student planning to take additional CSC courses must take CSC. 1410.

## CIVIL ENGINEERING

**Chair:** David W. Hubly  
**Staff Assistant:** Jean Smith  
**Office:** NC 3027  
**Telephone:** 556-2871  

**Faculty:** Paul E. Bartlett, Nien-Yin Chang, William C. Hughes, John R. Mays, William S. Pollard, Jr.  
**Associate Professors:** James C. Y. Guo, David W. Hubly, Lynn E. Johnson, Oren G. Strom, Tsong H. Wu  
**Assistant Professors:** Judith J. Stainaker, Andreas S. Vlahinos  
**Emeritus:** Ernest C. Harris, Martin L. Moody

Civil engineers are prime movers in creating our living environment. For example, we are responsible for the planning, design, analysis, and construction of buildings, bridges, and other structures; transportation systems including highways, airports, railroads, and pipelines; water distribution and wastewater collection systems; water resource systems which include dams and reservoirs; and environmental management systems including water and wastewater treatment plants. A civil engineer is part mathematician, chemist, physicist, architect, planner, soil scientist, and economist. Their broad scientific education provides civil engineers with diverse career opportunities and is the reason civil engineers are often good managers and policy makers. Our graduates find challenging positions with consulting engineering firms, government agencies, and various industries.

**Undergraduate**

The CU-Denver civil engineering curriculum and faculty focus on the areas of structural, geotechnical, transportation, water quality, and water resource engineering. The student receives instruction in the planning, design, and analysis methods used in each of these areas. The program also includes studies in mathematics and the basic sciences (physics, geology, and chemistry); in the engineering sciences such as statics, dynamics, thermodynamics, materials science, and fluid mechanics; and in the humanities and social sciences. The curriculum emphasizes the development of design and communication skills. Micro and main frame computer skills are taught early in the program of study and used frequently in subsequent courses.

**Typical Curriculum for B.S. (Civil Engineering)**

The required program of study for the Bachelor of Science degree in Civil Engineering is shown below. A minimum of 128 semester hours is required. The faculty provide advising on request to help the student plan an acceptable program of study. To receive the Bachelor of Science degree in Civil Engineering, the student must satisfactorily complete all the...
course work in the curriculum shown below, satisfy all University graduation requirements, and maintain at least a 2.0 grade-point average in the civil engineering courses.

1. Basic Science (34 semester hours)
   MATH. 1400-4. Calculus I
   MATH. 2401-4. Calculus II
   MATH. 2402-4. Calculus III
   MATH. 3020-4. Linear Algebra / Differential Equations
   PHYS. 2301-4. Physics I (calculus based)
   PHYS. 2351-4. Physics II (calculus based)
   CHEM. 1101-5. General Chemistry
   or CHEM. 2031 and 2038

2. Humanities/Social Sciences (18 semester hours)
   Each student develops a study plan in the humanities and social sciences in consultation with a faculty advisor that contains a primary, secondary, and minor focus areas and conforms with the College guidelines.

3. Communications (6 semester hours)
   Select two from:
   ENGL. 1020-3. Writing Workshop II
   ENGL. 3154-3. Technical Writing
   CMMU. 2101-3. Speech Making

4. Basic Engineering (12 semester hours)
   CSC. 1100-3. Introduction to Computing (Fortran)
   ENGR. 3023-3. Thermodynamics
   EE. 3030-3. Electric Circuits and Systems
   ENGR. 4000-0. Senior Seminar

5. Basic Civil Engineering (30 semester hours)
   CE. 2121-3. Analytical Mechanics I (Statics)
   CE. 2212-3. Plane Surveying
   CE. 3111-3. Analytical Mechanics II (Dynamics)
   CE. 3121-3. Mechanics of Materials
   CE. 3141-2. Materials Testing Laboratory
   CE. 3154-2. Water Quality Laboratory
   CE. 3313-3. Theoretical Fluid Mechanics
   CE. 3323-3. Applied Fluid Mechanics
   CE. 3505-3. Structural Analysis
   CE. 3602-3. Transportation Engineering
   CE. 3708-3. Soils/Foundation Engineering
   CE. 4718-2. Intermediate Soils Engineering (Soils Laboratory)

6. Civil Engineering Design (21 semester hours)
   CE. 3414-3. Design of Water and Wastewater Systems
   CE. 4067-3. Senior Design Projects

Select two of the following:

CE. 4427-3. Municipal Design Projects
CE. 4602-3. Highway Engineering
CE. 4738-3. Intermediate Foundation

Select two of the following:

CE. 4565-3. Timber Structure Design
CE. 4575-3. Design of Steel Structures
CE. 4585-3. Reinforced Concrete Design
7. Civil Engineering Electives (3 semester hours)
   Senior level and certain graduate level CE courses not included above as required courses.

8. General Electives (4 semester hours)
   Senior level and certain graduate level CE courses not included above as required courses, advanced mathematics or basic science courses, or advanced social sciences or humanities courses in the student’s primary interest area.

A typical four year program of study is shown below.

FRESHMAN YEAR

Fall Semester
   MATH. 1401. Analytic Geometry and Calculus I ................. 4
   Communications elective (see note 5) ... 3
   CSC. 1100. Introduction to Computing ... 3
   CHEM. 1130. Engineering General Chemistry (see note 2) ... 5

Total .......... 15

Spring Semester
   MATH. 2411. Analytic Geometry and Calculus II ................. 4
   PHYS. 2311. General Physics I ................. 4
   PHYS. 2321. General Physics Lab I ... 1
   CE. 2212. Plane Surveying ... 3
   ENGR. 1025. Graphics and Computer Aided Engineering ... 3

Total .......... 15

SOPHOMORE YEAR

Fall Semester
   MATH. 2421. Analytical Geometry and Calculus III ................. 4
   PHYS. 2331. General Physics II ................. 4
   Communications elective (see note 1) ... 3
   Humanities and social sciences elective (see note 3) ... 3
   CE. 2121. Analytical Mechanics I ................. 3

Total .......... 17

Spring Semester
   MATH. 3020. Elementary Differential Equations and Linear Algebra ................. 4
   Humanities and social sciences elective (see note 3) ... 3

Total .......... 16

Notes for B.S. (Civil Engineering)

1. Civil engineering students must either receive a C grade or better in ENGL. 1020 or pass an equivalency test administered by the English department, and must complete 6 hours of communication courses selected from the following:
   ENGL. 1020, ENGL. 3154, or CMMU. 2101.
2. Or CHEM. 2031 and 2038. CHEM. 2031 is required for students wishing to take CHEM. 2061 and CHEM. 2068 as a general elective.
3. Each student develops a study plan in the humanities and social sciences in consultation with a faculty advisor that contains primary, secondary, and minor focus
areas and conforms with the College guidelines. The study plan must include at least 18 credit hours, and also must include at least one upper division course in the student's primary focus area.

4. Civil engineering design elective courses are chosen by selecting two courses from each of the two groups shown below.

STRUCTURES GROUP:
CE. 4565. Timber Structure Design
CE. 4575. Design of Steel Structures
CE. 4585. Reinforced Concrete Design

MUNICIPAL/TRANSPORTATION/GEOTECHNICAL GROUP:
CE. 4427. Municipal Design
CE. 4602. Highway Engineering
CE. 4738. Foundation Engineering

5. Any upper division or higher civil engineering course which is not required may be used as a civil engineering elective.

6. Graduate electives may be senior level and certain graduate level CE courses not included as required courses, advanced mathematics or basic science courses not included as required courses, or advanced humanities or social sciences courses in the student's primary interest area.

Graduate

The CU-Denver Department of Civil Engineering offers the Master of Science degree in the areas of structural, geotechnical, transportation, water resources, and water quality engineering. The program is designed for practicing engineers with all courses being offered in the evenings or on Saturday. In addition, the Master of Engineering and Ph.D. degrees are offered in some of the above areas in cooperation with the CU-Boulder Department of Civil, Environmental and Architectural Engineering. The Master of Engineering degree is described under a separate heading in the catalog, and the Ph.D. degree is described in the University of Colorado at Boulder Catalog.

REQUIREMENTS FOR ADMISSION

Applicants for the CU-Denver civil engineering programs must satisfy the requirements of the Graduate School described in The Graduate School section of this catalog, have an ABET accredited undergraduate civil engineering degree, and have an undergraduate grade-point average of 3.0 (4 point scale) or better. Applicants whose previous work was in a field other than civil engineering also may be admitted; however, such applicants must take undergraduate basic science and/or civil engineering courses as required by the Department of Civil Engineering and the student's graduate advisor.

DEGREE REQUIREMENTS

Two M.S. degree programs are available in civil engineering—a thesis option (Plan I), and a non-thesis option (Plan II). The Plan I program requires the completion of 21 semester hours of graduate level course work and a research thesis (4 semester credits), and the Plan II requires the completion of 27 semester hours of graduate level course work and an engineering report (3 semester hours). The courses are selected by agreement among the student, a graduate advisor, and a graduate advisory committee. The research or report topics are selected by the graduate advisor; however, most advisors will consider the student's interests in selecting the topic. Each student also must satisfy the degree requirements of The Graduate School and the College of Engineering and Applied Science.

Courses

CE. 2121-3. Analytical Mechanics I. A vector treatment of force systems and their resultant, equilibrium of trusses, beams, frames, and machines; including internal forces and three dimensional configurations; static friction; properties of areas, including first and second moments; distributed loads; hydrostatics. Prer. or coreq., MATH. 2421.

CE. 2272-3. Structural Analysis I. Survey of structural analysis, forces on immersed bodies, structural properties of commonly used structural materials, such as steel, aluminum, timber, and concrete, and the testing and research techniques necessary to obtain these properties. Prer. or coreq., CE. 3121.

CE. 3154-2. Water Quality Laboratory. Lect. and lab. weekly, discussing techniques and making measurements of water quality parameters. Prer., CHEM. 1130, or 2031 and 2038. Prer. or coreq., MATH. 2411.

CE. 3313-3. Theoretical Fluid Mechanics. An introduction to the fundamentals of fluid mechanics. Subject matter includes fluid properties, hydrostatics, the continuum principle, the energy principle, the momentum principle, similitude and dimensional analysis, forces on immersed bodies, and laminar and turbulent flow in a closed conduit. Prer., CE. 2121.


CE. 3411-3. Design of Water and Wastewater Systems. Covers the design of water distribution and wastewater collection systems. Topics include the design process, estimation of water demand and sewage flows, analysis of pipe networks and sewer systems, cost estimating, and design selection. Field trips are required. Prer. or coreq., CE. 3323.


CE. 3602-3. Transportation Engineering. Introduction to the technology, operating characteristics, and relative merits of highway, airway, waterway, railway, pipeline, and conveyor transportation systems. Recent transportation system innovations. Prer., junior standing or consent of instructor.

CE. 3708-3. Introduction to Soils Mechanics and Foundation Engineering. Introduction to physical and mechanical properties of soils; seepage, consolidation, shear strength, bearing capacity, lateral earth pressure, stability, and pile behavior, with preliminary analysis of structures affected by soil properties. Prer., CE. 3121; prer. or coreq., CE. 3313.

CE. 4067-3. Senior Design Projects. Senior civil engineering students, working in teams, are assigned significant open-ended design problems requiring the synthesis of material learned in previous engineering courses for solution. Design teams work independently under the supervision of a civil engineering faculty member. Prer., senior standing.

CE. 4087-3. Engineering Contracts. Laws met by the practicing engineer, types of contracts, specification writing, laws on contracts, agency, partnership, sales, and property, with primary emphasis on rights and duties of the engineer. Prer., senior standing.


CE. 4427-3. Municipal Design Projects. Analysis and design of municipal public works, including street systems; drainage and flood control systems; water collection, treatment, and distribution systems; sewage collection and treatment systems. The interplay between these systems and their correlation with land characteristics and use. Prer., CE. 3602; pre- or coreq., CE. 3414.

CE. 4494-3. Introduction to Environmental Pollution. A multi-disciplinary examination of the problems of environmental pollution. The course focuses particularly on the chemical, social, biological, economic, and engineering aspects of environmental pollution: composition and sources; health and social costs; methods of reduction and control. Open to any nonengineering or engineering student having at least junior standing. Prer., upper division standing.


CE. 4718-2. Intermediate Soils Engineering. Continuation of CE. 3708 into selected topics in soils engineering. Laboratory experiments are performed to assess index properties of soils including gradation, soil consistency, and specific gravity; moisture-density relations; soil classification, permeability; compressibility; and shear strength of soils. These soil parameters are then used in a design project required for the course. Prer. or coreq., CE. 3708.


CE. 480X-483X-1 to 6. Special Topics for Seniors. Supervised study of special topics of interest to students under guidance of instructor. Prer., consent of instructor.

Note: Courses at the 5000 level are open to qualified seniors subject to departmental approval. Not all graduate courses are offered each year.


CE. 5333-3. Applied Hydrology. Engineering application of the principles of hydrology. Subject matter includes precipitation measurement and data analysis, stream flow measurement and water budget analysis, evaporation and evapotranspiration, infiltration and rainfall-runoff relationships, hydrograph properties and unit hydrograph analysis, flood frequency analysis and flood routing. Prer., graduate standing or consent of instructor.

CE. 5334-3. Groundwater Hydrology. Topics include groundwater occurrence, hydrologic cycle and budget, interactions with surface waters, principles of groundwater flow, well hydraulics, well field design, regional flow systems, water and pollutant chemistry, computer modeling, and groundwater management. Emphasis is on quantitative analysis methods for groundwater resource inventory, design and management. Prer., graduate standing or consent of instructor.

CE. 5335-3. Advanced Hydrology. Focuses on state-of-the-art hydrologic modeling with emphasis on the rainfall-runoff system and the associated processes of precipitation, infiltration and abstraction, runoff hydraulics and flow routing. Course work includes both reviews of basic theory and hands-on simulations using HEC-1 and similar software. Prer., graduate standing or consent of instructor.

CE. 5343-3. Open Channel Hydraulics. Engineering analysis and design of natural and artificial open channels. Application of uniform flow concept to design of erodible and nonerodible channels. Application of energy and momentum principles to conditions of gradually varied flow, spatially varied flow and rapidly varied flow. Prer., CE. 3323 or consent of instructor.

CE. 5344-3. Computational Hydraulics. Derivation of basic principles of unsteady open channel flow. Application of Kinematic wave, Diffusive wave and dynamic wave approaches to open channel flow including overland flow and flow in a drainage or river network. Introduction of numerical finite difference method, characteristic method and simplified analytical method to the solutions of unsteady open channel flow. Evaluation of some computer simulation models such as DWOPER including requirements of input data and sensitivity to parameters. Prer., CE. 5343.

CE. 5383-3. Geographic Information Systems and Facilities Management. This graduate seminar course provides exposure to and experience with various aspects of GIS/FM technology and its uses for resource planning and infrastructure management. The course provides detailed information on key phases of the GIS project, including justification, definition of hardware/software, data base design, data conversion, and staffing management. Hands-on use of GIS/FM...
workstation(s) and computer facilities is an integral part of the course. GIS/FM technology is multidisciplinary, having application to all fields of engineering (civil, electrical and computer science, mechanical), planning, geography, and management. Prer., graduate standing or consent of instructor.


CE. 5394-3. Water Resource Systems. Course addresses the concepts, general processes, and quantification methods used in planning and analysis of water resource systems. Topics include review of water resource system planning and operations problems and goals, analysis methods, computer simulation and optimization. Prer., graduate standing and consent of instructor.


CE. 5414-3. Physical Processes in Water Quality Engineering. Design and analysis of physical processes used in treatment of water and waste water. Prer., graduate standing or consent of instructor.


CE. 5455-3. Engineering Project Management. Project management approaches appropriate to public and private sector engineering practice. Topics covered will include engineering project organization, planning, budgeting, scheduling, resource allocation, monitoring, control, evaluation, and termination. Case studies will range from research and development projects through major engineering design projects, to manufacturing and construction projects. Prer., graduate standing or consent of instructor.


CE. 5457-3. Administration of Public Works. A descriptive course concerned with the administration of engineering and planning aspects of urban public works. Prer., graduate standing in civil engineering or public administration, or consent of instructor.

CE. 5504-3. Public Health Engineering. Environmental engineering methods used in the protection of public health and the management of our environment. Topics include water pollution control, air pollution control, hazardous waste management, health effects, and public health protection. Prer., graduate standing or consent of instructor.

CE. 5515-3. Introduction to Finite Element Analysis. Systematic formulation and application of the finite element approximation to the solution of engineering problems. Topics include one- and two-dimensional elasticity problems, two-dimensional heat flow and irrotational fluid flow. Elements considered include triangular and quadrilateral elements formulated by elementary and isoparametric techniques. Prer., graduate standing or consent of instructor.


CE. 5565-3. Prestressed Concrete Design. Design of prestressed concrete members, ultimate strength, load balancing, prestress losses, anchorage design, shear design, slabs, continuous members, deflections. Prer., CE. 4585 or consent of instructor.

CE. 5575-3. Advanced Topics in Structural Steel Design. Plate buckling, plate girder design, and other topics determined by class interest. Prer., CE. 4575.


CE. 5622-3. Urban Transportation Planning. Definition of urban transportation problems, sociology of urban regions, history of urban growth, models of urban growth, population forecasts, land use surveys and planning, trip generation characteristics, distribution and assignment, modal split, system evaluation, CBD transportation planning. Prer., graduate standing or consent of instructor.

CE. 5632-3. Airport Planning and Design. National Airport System Plan, air travel demand, geometric design of airport facilities, design of airport pavement and drainage structures, and airport environmental impact. Prer., CE. 3602 and graduate standing or consent of instructor.

CE. 5642-3. Urban Traffic — Characteristics. Human and vehicular characteristics, speed and volume studies, origin and destination studies, traffic flow theory, stream characteristics, intersection characteristics, signalized intersections, accident characteristics, parking characteristics, highway lighting, and miscellaneous topics. Prer., CE. 3602 and graduate standing or consent of instructor.

CE. 5652-3. Urban Traffic — Operations. Traffic control devices, traffic signal timing and equipment, signal systems, computer applications to traffic control, urban operations, freeway operations, traffic applications of linear programming. Transportation problems, dynamic programming, surveillance, and control. Prer., CE. 5642 and graduate standing or consent of instructor.

CE. 5662-3. Transportation System Safety. Safety aspects of highway, railroad, and airway transportation systems. Accident analysis, accident prevention, economic consequences of accidents. Prer., CE. 3602 and graduate standing or consent of instructor.

CE. 5682-3. Pavement Design. Design of flexible and rigid pavements for highways and airports, stress analysis in flexible and rigid pavements; design of joints and reinforcing steel for rigid pavements; principles of subgrade stabilization. Prer., CE. 3602 and 4718.


CE. 5708-3. Advanced Soils Engineering. A unified treatment of the foundation of soil engineering analysis. Topics include stress-strain-strength of soils; generalized limiting equilibrium analysis; stability analyses of earth retaining structures, slopes, and shallow foundations; probabilistic approach of stability assessment; computation of settlement of foundations in sand and clay and time-rate of consolidation and critical state concept. Special attention is directed toward the illustration of theory through practical examples. Prer., CE. 3708 and 4718, plus graduate standing or consent of instructor.

CE. 5718-3. Engineering Properties of Soils. Engineering properties of soils, including index properties, permeability, stress-strain behaviors, shear strength, compressibility, critical state soil models and their application in interpreting soil behaviors. Attention also is directed to laboratory and in-situ tests to examine the validity of shear strength and compressibility theories and their application to stability and settlement.

CE. 5738-3. Foundation Engineering.
Methods of subsurface exploration and sampling of soils, lateral support in open cuts, control of groundwater, analysis and design of shallow foundations, analysis and design of deep foundations, bridge abutments and coferdams, underpinning, and application of modern computational techniques to analysis and design of foundations. Prer., CE. 5708 and 5718, plus graduate standing or consent of instructor.

Theory, design, and construction of earth embankment. Use of published data, field exploration, and laboratory tests on soils and rock in investigating foundations and construction materials. Principles of compaction and settlement. Slope stability analysis, landslide recognition and control, use of benches and beams. Prer., CE. 3708 and 4718, plus graduate standing or consent of instructor.

Course will discuss geotechnical perspectives of hazardous wastes problems, issues in wastes disposal, and measures required to mitigate and solve the problems. Topics will include waste characterization; site investigation; geotechnical and chemical parameters required in the design of waste containment structures; current regulations including CERCLA and RCRA; design and construction of clay liners; effects of various chemicals on permeability, compressibility and strength of soils; design and construction of geomembranes; principles and case histories for remedial designs at existing sites; contaminant migration through advection, dispersion, and diffusion; principles of risk assessment; and waste disposal issues in Colorado. Prer., graduate standing or consent of instructor.

Nature of rock masses, geological exploration, deformability and strength of rock and joint materials, slope stability in hard rocks, physical models in geological engineering, in-situ tests of deformability and strength, in-situ stresses and deformation, rock hydraulics. Prer., CE. 3708 and 4718, plus graduate standing or consent of instructor.

Surface exploration and characterization of rock masses, slope stability, analysis of rock masses; rock mass reinforcement; tunnel and shaft designs, design of underground rock chambers; foundations on rocks, and dam design. Prer., CE. 5768, plus graduate standing or consent of instructor.

CE. 5788-3. Foundation Design on Expansive Soils.
Topics discussed in this course include formation and distribution of bentonite soils; effects of clay minerals, climatic conditions, and moisture migration on swelling potential and pressure of soils; laboratory and field evaluations of swelling potential and pressure; design of drilled piers and post-tensioned slabs on bentonite soils; soil improvement and stabilization methods used in reducing swelling potential and pressure; case histories for evaluating foundation systems on bentonite soils; and litigation and how to avoid it. Prer., graduate standing or consent of instructor.

Principles of vibrations, and wave propagation in elastic, homogeneous, isotropic media; laboratory and in situ measurements of soil properties; applications of these principles and properties to the design of foundations subject to dynamic loading generated by machinery, earthquakes, or blasts. Prer., CE. 5708 and 5718, plus graduate standing or consent of instructor.

CE. 580X to 583X-1 to 3. Selected Topics (Master's Level).
Typical topics include:
- Computer-aided Structural Engineering
- Nonmatrix Structural Analysis
- Structural Planning
- Spreadsheet Applications
- Field Instrumentation
- Hazardous Wastes Engineering
- Advanced Steel Design II
- Hydraulic Transients

CE. 5950-variable credit. Master's Thesis.

CE. 5960-variable credit. Master's Report.

CE. 6111-3. Dynamics of Structures.


Buckling of columns, beams, frames, plates, and shells in the elastic and plastic range. Post-buckling strength of plates. Analysis by exact and approximate methods with special emphasis on practical implications and application of solutions. Prer., CE. 3121 and MATH. 3020.

Design of small dams including reservoir sizing, spillways, and energy dissipators. Design of urban drainage and flood control facilities such as culverts, transitions, roadside ditches, street inlets, detention/retention ponds, storm sewer system, drainage channels, and channel erosion controls including vegetation, concrete, riprap protection. Design of floodplain encroachment, natural channel improvement, and bridge hydraulics. Prer., CE. 5333 and 5343.

CE. 6738-3. Finite Element Method in Geotechnical Engineering.
The principles and applications of finite element methods in geotechnical engineering. Topics include review of fundamental finite element analysis procedures; finite element analyses of seepage and ground water flow, consolidation, earth embankment, excavation, and soil-structure interaction; nonlinear solution techniques; constitutive models of geologic materials and their implementation in finite element methods; special analytical procedures associated with geotechnical engineering problems such as limited tension behavior, sequential construction operation, and soil-structure interface behavior. Prer., CE. 5515 and 5708, plus graduate standing or consent of instructor.

CE. 780X to 783X-0 to 3. Selected Topics (Doctoral Level).
Credit and subject matter to be arranged. Prer., variable.

CE. 7990-variable credit. Doctor's Thesis.

Independent Study

CE. 1840/2840/3840/4840-1 to 6. Independent Study (Undergraduate).
This category is intended for topics which students may wish to pursue on their own initiative, with guidance from a professor who agrees to limited consultation on the work and to award credit when the project is completed. Departmental approval is required.

CE. 5840-1 to 6. Independent Study (Master's Level).
Available only through approval of the graduate advisor. Subjects arranged to fit needs of particular student.

CE. 7840-1 to 6. Independent Study (Doctoral Level).
Available only through approval of the graduate advisor. Subjects arranged to fit needs of particular student.

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Chair: Joe E. Thomas
Associate Chair (EE): Donald S. Gage
Staff: Christy Mourning
Office: NC 2615
Telephone: 556-2872
Associate Chair (CSC): Douglas A. Ross
Staff: Marcia McCandless
Computer Science Office: NC 2605
Telephone: 554-4314

Faculty: Professors: John R. Clark, Jochen Edrich, Donald S. Gage, Arun K. Majumdar, William D. Murray, Joe E. Thomas
Associate Professors: Marvin F. Anderson, Jan Bialasiewicz, Douglas A. Ross, Pankaj K. Sen, William Wolfe
Assistant Professor: Gita Alaghband
Senior Instructors: Ravel Ammerman, Brian Atkinson, Wilbur Goltermann, Carol Keene, Paul Novak, Jay Oplinger, Ellen Phelps, Valentine E. Riegert, Jay Rothman, Richard O. Taylor
Emeritus: Herb Reno, Edward T. Wall

Undergraduate

COMPUTER SCIENCE AND ENGINEERING PROGRAM

The Bachelor of Science in computer science and engineering prepares students for creative work and graduate study in computer science, software engineering, and computer engineering. The emphasis is on fundamental concepts and basic principles with a long useful life. This distinguishes the program from more vocationally oriented programs which emphasize current technology. In this rapidly changing field, current technology is obsolete after only a few years, after which the vocational graduate is ill prepared to grow technically. Graduates of this program will be able to keep abreast of current technology as it evolves over the years, due to their strong grounding in fundamentals.

Early in the program, emphasis is placed on development of the conceptual foundations of computer science. Topics such as algorithm development, programming language concepts, information representation, and the structure of computers are presented from both a practical and conceptual standpoint. Later portions of the program focus on computer architecture; the interrelationship of hardware and software; and software design, theory, and practice.

COMPUTER SCIENCE AND ENGINEERING CURRICULUM

The curriculum in computer science and engineering is planned to give breadth of background in computer science and engineering after establishing a solid foundation in mathematics and science. Each student will take electives emphasizing computer-related areas. Those who wish to study computers with a heavier emphasis on electrical engineering should consider the electrical engineering program with electives from computer science, or consider a second degree in electrical engineering.

To be awarded the B.S. in computer science and engineering, a student must have at least a 2.0 average in all computer science and electrical engineering courses applied to the degree. To be in good standing in the program (see Policy on Academic Progress in the College of Engineering introductory section of this catalog) a student must maintain a 2.0 average in all computer science and electrical engineering courses attempted. All students are required to set up an appointment with the department senior checkout advisor before registering for the last 30 hours of their program.

Typical Curriculum for B.S. (Computer Science)

FRESHMAN YEAR

Fall Semester | Semester Hours
--- | ---
MATH. 1401. Analytic Geometry and Calculus I | 4
Science electives (see note 1) | 3
ENGL. 1020. Writing Workshop I (see note 2) | 3
Total | 15

Spring Semester

MATH. 2411. Analytic Geometry and Calculus II | 4
CSC. 1510. Logic Design | 3
CSC. 2614. Discrete Math I | 3
CMMU. 2101. Speechmaking (see note 2) | 3
Humanities and social sciences electives (see note 3) | 3
Total | 16

SOPHOMORE YEAR

Fall Semester

MATH. 2421. Analytic Geometry and Calculus III | 4
CSC. 2421. Data Structures and Program Design I | 3
CSC. 3614. Discrete Math II | 3
Science electives (see note 1) | 4
Total | 16

Spring Semester

CSC. 2525, Assembly Language & Computer Organization | 3
CSC. 2431. Data Structures & Program Design I | 3
Science electives (see note 1) | 5
Humanities and social sciences electives (see note 3) | 6
Total | 17

JUNIOR YEAR

Fall Semester

MATH. 3810. Probability Theory | 3
CSC. 3401. Analysis of Algorithms | 3
CSC. 3415. Principles of Programming Languages | 3
Area elective (see note 4) | 3
Science elective (see note 1) | 1
Humanities and social sciences electives (see note 3) | 3
Total | 18

Spring Semester

CSC. 3453. Operating System Concepts | 3
CSC. 4591. Computer Architecture | 3
Area elective (see note 4) | 3
Science elective (see note 5) | 3
Total | 16

SENIOR YEAR

Fall Semester

CSC. 4739. Software Design Project | 3
Area electives (see note 4) | 6
General elective (see note 5) | 3
Total | 15

Spring Semester

CSC. 4739. Software Design Project | 3
Area electives (see note 4) | 9
Humanities and social sciences elective (see note 3) | 3
Total | 15

Notes for B.S. (Computer Science)

Students should refer to the section on Academic Policies of the College of Engineering and Applied Science. All students must make appointments with their assigned advisor at least once per year. Lists of faculty and their advises are posted outside the CSC office which is located in NC 2605.

1. A total of 18 hours of the curriculum are devoted to A) a two-semester sequence in a laboratory science for science majors and B) two additional courses in science. Among these courses must be PHYS. 2311-4 and CHEM. 2031-4 (or equivalent).
2. Communication Skills: A) Written Communications — Students must pass ENGL. 1020, Writing Workshop I, with a C- or better or have English composition transfer credit which is acceptable to the department. With department approval, ENGL. 3154, Technical Writing, may be
used to complete the written portion of the communication requirement if the student has passed the equivalency test. (This written communications requirement must be completed prior to taking CSC. 2421.) B) Oral Communications: Students must pass CMMU. 2101, Speechmaking, or have speech transfer credit which is acceptable to the department. (This oral communications requirement must be completed prior to taking CSC. 4739.)

3. The humanities and social sciences electives must include both depth and breadth. Of the total of 24 hours devoted to this portion of the CSC program, at least 6 semester hours (a minimum of 2 courses) must be upper division. In agreement with the Rules of the College of Engineering, a student may elect to take an upper division humanities and social sciences course pass/fail. A three course sequence must be taken in one field with at least one of those being upper division. Two courses must be taken in a second field. One course must be taken in a third field. Assuming a course normally carries 3 hours of credit, two more courses must be taken to complete the requirement. Courses taken to satisfy the humanities and social sciences electives requirement may be any of those approved by the department. A list of approved courses is available through the CSC office in NC 2605.

4. The area electives account for 21 hours of the CSC program. The student must take any three of the four courses: CSC. 4555, CSC. 4287, CSC. 4202, CSC. 4656. These courses are Compiler Design, Database System Concepts, An Introduction to Artificial Intelligence, and Numerical Analysis I, respectively. The student must choose the remaining courses from among the following areas of study: computer science, mathematics, and engineering. These secondary area electives must be part of a plan approved by the department prior to taking the courses.

5. General electives are selected from any course acceptable to the College of Engineering and Applied Science. The student should note that skills courses, performance courses, and remedial courses are not acceptable).

**ELECTRICAL ENGINEERING PROGRAM**

The professional possibilities in electrical engineering include teaching and research in a university; research and development of new electrical or electronic devices, instruments, systems, or products; design of computers, computer interfaces, communications and control systems, or power systems and machines; production and quality-control of electrical products or systems for private industry or government; and sales or management for a private firm or branch of government.

The electrical engineering course of study begins with principles of physics, chemistry, mathematics, and computers, then follows with an intensive training in the theory and laboratory application of logic and electrical circuits, electromagnetic fields, transmission theory, linear systems, electrical machines and transformers, and electronics and microprocessors. Throughout the entire course of study, students reinforce their understanding of theory through laboratory experience and extensive design projects.

**ELECTRICAL ENGINEERING CURRICULUM**

To be able to graduate and to be in good standing in the program (see Policy on Academic Progress in the College of Engineering introductory section of this catalog), a student must maintain at least a 2.0 grade-point average in all EE. and CSC. courses attempted. All students are required to set up an appointment with the department senior check-out advisor before registering for the last 30 hours of their program.

**Combined Degree Options**

More specific information on combined degree requirements may be obtained from the EE office, 556-2872.

**Typical Curriculum for B.S. (Electrical Engineering)**

**FRESHMAN YEAR**

<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Semester Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH. 1401. Analytic Geometry and Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM. 1130. Engineering General Chemistry (see note 3)</td>
<td>5</td>
</tr>
<tr>
<td>CSC. 1510. Logic Design</td>
<td>3</td>
</tr>
<tr>
<td>ENGL. 1020. Writing Workshop II (see note 1)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

**Spring Semester**

| MATH. 2411. Analytic Geometry and Calculus II | 4 |
| PHYS. 2311. General Physics I | 4 |
| PHYS. 2321. General Physics Lab. I | 1 |
| CSC. 1410. Fundamentals of Computing I | 3 |
| Humanities and social sciences elective (see note 2) | 3 |
| Total | 15 |

**SOPHOMORE YEAR**

<table>
<thead>
<tr>
<th>FALL SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS. 2331. General Physics II</td>
</tr>
<tr>
<td>MATH. 2421. Analytic Geometry and Calculus III</td>
</tr>
<tr>
<td>EE. 2132. Circuit Analysis I</td>
</tr>
<tr>
<td>EE. 2532 Sophomore Lab. I</td>
</tr>
<tr>
<td>CMMU. 2101. Speech Making (see note 1)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPRING SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH. 3020. Elementary Differential Equations and Linear Algebra</td>
</tr>
<tr>
<td>Physics elective (see note 4)</td>
</tr>
<tr>
<td>EE. 2142. Circuit Analysis II</td>
</tr>
<tr>
<td>EE. 2542. Sophomore Lab. II</td>
</tr>
<tr>
<td>EE. 2651. Assembly Language and Computer Organization</td>
</tr>
<tr>
<td>Humanities and social sciences elective (see note 2)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**JUNIOR YEAR**

<table>
<thead>
<tr>
<th>FALL SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE. 3133. Electromagnetic Fields I</td>
</tr>
<tr>
<td>EE. 3215. Electronics I</td>
</tr>
<tr>
<td>EE. 3715. Electronics Lab</td>
</tr>
<tr>
<td>EE. 3724. Power Lab</td>
</tr>
<tr>
<td>Computer elective (see note 5)</td>
</tr>
<tr>
<td>EE. 3164. Energy Conversion</td>
</tr>
<tr>
<td>Humanities and social sciences elective (see note 2)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPRING SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE. 3143. Electromagnetic Fields II</td>
</tr>
<tr>
<td>EE. 3225. Electronics II</td>
</tr>
<tr>
<td>EE. 3316. Linear Systems Theory</td>
</tr>
<tr>
<td>EE. 3735. Junior Lab</td>
</tr>
<tr>
<td>EE. 3817. Probability Theory</td>
</tr>
<tr>
<td>Humanities and social sciences elective (see note 2)</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
SENior YEAR
Fall Semester
EE. Specialty (see note 6) .......... 3
EE. 4309, Senior Design Seminar
(seenote 9) ....................... 2
Senior EE. Lab. elective (see note 7) ... 2
Professional elective (see note 8) .... 3
Engineering science elective
(seenote 10) ........................ 3
Humanities and social sciences elective
(seenote 1) .......................... 3
ENGR. 4000, Senior Seminar ......... 0
Total ................................ 16

Spring Semester
EE. Specialty (see note 6) .......... 6
EE. 4319, Senior Design Project
(seenote 9) ....................... 3
Senior EE. Lab. elective (see note 7) ... 2
Professional elective (see note 8) .... 3
Humanities and social sciences elective
(seenote 2) .......................... 3
Total ................................ 17

Notes for B.S. (Electrical Engineering)

All students must satisfy this curriculum if their graduation date is May 1991 or later.
Students should refer to the section on Academic Policies of the College of Engineering and Applied Science. In addition to planning for sequences of courses based on prerequisites, students should plan to complete sophomore level courses before taking junior level courses and should have completed their junior level EE courses before starting their senior level EE electives.

1. Communication Skills (6 semester hours): A) Written Communications - Students must pass ENGL. 1020, Writing Workshop II, with a C- or better or have English composition transfer credit which is acceptable to the department. With department approval, ENGL. 3154, Technical Writing, may be used to complete the written portion of the communication requirement if the student has passed the equivalency test. (This written portion of the communication requirement must be completed prior to taking EE. 2142 and 2542 in the EE program.) B) Oral Communications: CMML. 2101, Speechmaking. This requirement must be completed prior to taking EE. 3735 in the EE program.

2. Humanities and social sciences courses (18 semester hours). These electives must include both breadth and depth. In agreement with the Rules of the College of Engineering and Applied Science, the courses should be chosen to form a coherent, well-structured exploration of a substantive issue or theme. In addition, a student may elect to take an upper division humanities and social sciences course pass/fail. Consult the department office for additional information.

3. Or CHEM. 2031 and 2038.

4. The following courses may be taken to satisfy the physics elective requirement.

PHYS. 2811, Modern Physics; PHYS. 3211, Analytical Mechanics; or PHYS. 3411, Thermal Physics. If PHYS. 3211 is taken, the required engineering science elective (see note 10) is ENGR. 3012, Thermodynamics; if PHYS. 3411 is taken the required engineering science elective is CE. 3131, Applied Mechanics.

5. To satisfy the computer elective any of the following courses may be taken:

CSC. 2421, Data Structures and Program Design; EE. 3511, Computer Interfacing; or EE. 3651, Digital Hardware Design. Additional information concerning options is available in the EE office.

6. For the EE specialty courses a student must take 3 of: EE. 4136, Control Systems; EE. 4184, Power Systems Analysis; EE. 4225, Digital Electronics; EE. 4247, Communication Theory; EE. 4591, Computer System Design.

7. The senior EE lab elective requirement may be satisfied by taking two of the following labs, not in the same area: EE. 4406-2(S), EE. 4411-2 (D), EE. 4423-2 (C), EE. 4435-2 (E), EE. 4444-2 (P), or EE. 4453-2 (F), or EE. 4467-2 (C).

8. Professional electives are to be selected from approved upper division courses in business, computer science, engineering, mathematics, or physics.

9. All EE. students must satisfactorily complete the EE. 4309, Senior Design Seminar, and EE. 4319, Senior Design Project, in succeeding semesters.

10. The engineering science elective may be satisfied by taking either of the two following courses: CE. 3131, Applied Mechanics, or ENGR. 3012, Thermodynamics. If ENGR. 3012 is chosen as the engineering science elective, then the physics elective must be fulfilled by either PHYS. 2811, Modern Physics, or PHYS. 3211, Analytical Mechanics; if CE. 3131, Applied Mechanics, is chosen as the engineering science elective, then the physics elective must be fulfilled by either PHYS. 2811, Modern Physics, or PHYS. 3411, Thermal Physics.

Graduate

REQUIREMENTS FOR ADMISSION

A student wishing to pursue graduate work in electrical engineering or computer science should read carefully the Requirements for Advanced Degrees section in this catalog, and also should obtain a copy of the specific degree requirements by writing to Graduate Admissions, Department of Electrical Engineering and Computer Science, University of Colorado at Denver, 1200 Larimer St., Campus Box 110, Denver, CO 80204.

COURSES

CSC. 1100-3. Computing with FORTRAN. A first course in computer programming using the FORTRAN language. Basic language grammar, program structure, and problem solving techniques. (Credit toward a degree is not allowed for both CSC. 1100 and CSC. 1410.) Prere., MATH. 1120.

CSC. 1410-3. Fundamentals of Computing. A first course in computing for those who will take additional computer courses. Covers the capabilities of a computer, the elements of a computer language, and the basic techniques for solving problems using a computer and a programming language. The PASCAL programming language is used as a vehicle for teaching these concepts. Prere. or coreq., MATH. 1401. (Credit toward a degree not allowed for both EE. ./ CSC. 1100 and EE. ./ CSC. 1410.)

CSC. 1510-3. Logic Design. The design of combinational and sequential switching circuits. Topics include Boolean algebra, minimization techniques, circuit analysis and synthesis, and finite state machines. Prere., MATH. 1120 or equivalent.

CSC. 1708-3. Computing with C I. A first introduction to programming using the C language. The focus of the course is on using C and on the fundamentals of developing programs. Prere., high school algebra. (This course may not be used by ESC majors for graduation credit.)


CSC. 1950-3. Computer Mind Tools I. Development of proficiency in the use of the Macintosh as a generalized, state-of-the-art learning tool through completion of weekly projects in word processing, including use of a dictionary, thesaurus, and formatting tools; authored (free-form) graphics; structured graphics (elementary CAD); spreadsheets with graphical presentations; database with query, selection, reporting, and merging; integration of results among tools; project scheduling; and HyperMedia, including elementary object-like scripting to control text, graphics, animation, and sound. One-hour lecture/demonstration plus two 75 minute laboratory sessions per week. Requires additional 4–6 hours to complete weekly project.

CSC. 2421-3. Data Structures and Program Design I. The second semester of a three-semester sequence in computing. Topics include the conclusion of the study of a block structured language, a first look at algorithm analysis, the software development process, abstract data types, and basic
techniques such as sorting, searching, and recursion. Programming exercises are assigned throughout the semester. Prer., CSC 1410 and ENGL. 1020. CSC. 2614 recommended.

CSC. 2431-3. Data Structures and Program Design II. The third semester of a three-semester sequence in computing. Topics include an extension of the discussions on the software design and implementation process, algorithm analysis, sorting, searching, recursion, and dynamic data structures. New areas of discussion will include file systems, and operating system software. Programming exercises are assigned throughout the semester. Some of the assignments will require that the student use a specified operating system and/or hardware. Prer., CSC., 2421; coreq., CSC. 3614.

CSC. 2525-3. Assembly Language and Computer Organization. (EE. 2651.) Topics include computer architecture, program execution at the hardware level, programming in assembly language, the assembly process, hardware support of some high-level language features, and a program's interface to the operating system. Programming exercises are assigned in this course. These exercises involve the use of specific hardware in designated laboratories. Prer., CSC. 1410 and 1510.

CSC. 2614-3. Discrete Mathematics I. (MATH. 2614.) First course of a two-semester sequence providing discrete mathematics concepts needed in computer science. Topics include symbolic logic, methods of proof, mathematical induction, principles of counting, functions and relations. CSC. applications and use of programming in problem solving are emphasized. Prer., CSC. 1410.

CSC. 2701-3 Macintosh Hypermedia. Intensive study and application of the revolutionary product, HyperCard, and its declaratory, object-oriented scripting language, HyperTalk. Applications as a front-end to the operating system and other programs; as a file manager and database management system in its own right; as a presentation tool with animation and sound; and as an intellectual tool (the "Knowledge Navigator"). Prer., CSC. 1950 or advanced Macintosh experience.

CSC. 280X-283X-variable. Special Topics. CSC. 3401-3. Analysis of Algorithms. Introduction to design and analysis of algorithms requiring advanced data structures (trees, heaps, graphs, matrices). Includes design concepts such as divide and conquer and analysis concepts such as correctness and computational complexity. Applications include sorting, searching, and graph algorithms. Prer., CSC. 2431 and 3614.

CSC. 3415-3. Principles of Programming Languages. An introduction to programming languages, e.g., FORTRAN, ALGOL, PASCAL, ADA, and LISP. Elementary and structured data types, control structures, scope, formal syntax specification, and language design issues. Prer., CSC. 2421 and 2525.

CSC. 3453-3. Operating Systems Concepts. A review of the principles of computer operating systems and the essential components of an operating system. Interfaces with compilers, interpreters, hardware and user programs will be considered. Prer., CSC. 3401.

CSC. 3607-2. Computer Laboratory. This course will provide computer science students a laboratory experience with digital computer subsystems and with complete computer subsystems. Prer., CSC. 2525, EE. 2532, and ENGL. 1020.

CSC. 3614-3. Discrete Mathematics II. (MATH. 3614.) Second course of a two-semester sequence providing discrete mathematics concepts needed in computer science. Topics include probability, recurrence equations, trees, graphs, and matrix algebra. CSC. applications and use of programming in problem solving are emphasized. Prer., CSC. 2411.

CSC. 3708-3. Computing With C II. An introduction to problem solving using the C language. Approximately one fourth of the course is devoted to C program syntax and semantics. During the remainder of the course, problem solving techniques, algorithms, and program design techniques will be discussed. Prer., 2 semesters of software development courses or appropriate industrial experience.

CSC. 3718-3. Computing with ADA. A first course in programming in the ADA language. Topics include ADA's program structure, syntax and semantic issues, data structures and data types, ADA packages, control structures, exception handling, and concurrent execution. Prer., CSC. 3415.

CSC. 3939-1. Cooperative Education. Faculty/employer supervised employment in industry. Enrollments is limited to students who fully complete a Contract for Cooperative Education Credit by the last day of the drop/add period. Prer., CSC. 2521.


CSC. 4134-3. Applied Graph Theory. (MATH. 4134.) An introduction to discrete structures and their applications. Major emphasis is on applications of graph theory to computer science, engineering, and operations research. Topics include connectivity, coloring, trees, Euler and Hamiltonian paths and circuits, matching and covering problems, shortest route, and network flows. Prer., MATH. 3000.

CSC. 4202-3. Introduction to AI. Introduction of AI system implementations using the Lisp programming language. Application of expert systems and natural language techniques will be covered in detail. Examination of non-numeric processing, AI systems architectures, user interfaces, intelligent databases, and specific Lisp development environments. Prer., CSC. 3401, 3415, and 3453.


CSC. 4508-3. Introduction to Software Engineering. This course introduces the CSC student to project planning, requirement analysis, design methodologies, real-time system design, and testing and verification methods. Prer., CSC. 3415 and 3401.


CSC. 4591-3. Computer Architecture. This course is concerned with computer arithmetic units, memory systems, control systems, and input-output units. The emphasis is on logic structure rather than electronic circuitry. Prer., CSC. 2525, prer., or coreq., CSC. 3453.


CSC. 4701-3. Data Communications I. This course is an introduction to computer networks including some well known systems and standards. Emphasis is placed on concepts such as modulation, routing algorithms, and protocol services. Each layer of the ISO OSI model is presented, from physical to application layer. Prer., senior standing.

CSC. 4711-3. Data Communication and Networks II. This course pulls together the concepts from CSC. 4701. The AppleTalk network, the AppleTalk network, is examined in detail. The students' projects will encompass everything from session establishment to routing table calculation. Prer., CSC. 4701.

CSC. 4739-3. Software Design Project. A project laboratory in which students undertake a significant hardware design, software design, or simulation. The objective is the understanding of the specification-design-test cycle. Prer., senior standing in computer science, ENGL. 1020 and CMMU. 2101, CSC. 4508.
CSC. 480X-483X-1 to 3. Special Topics (Undergraduate). Credit and subject matter to be arranged. Prer., variable.

CSC. 4939-1. Cooperative Education. Faculty/employer supervised employment in industry. Enrollment is limited to students who fully completed a Contract for Cooperative Education Credit by the last day of the drop/add period. Prer., CSC. 3415.

GRADUATE COURSES

Graduate courses are offered by the Department of Electrical Engineering and Computer Science and by the Department of Mathematics. The courses listed are not offered each semester. Check the department offices for tentative listings for future semesters.

CSC. 5144-3. Applied Combinatorics. (MATH. 5409.) Major emphasis is on applied combinatorics and graph and combinatoric algorithms. Topics include general counting methods, generating functions, recurrence relations, inclusion-exclusion, Polya's enumeration theory, and network algorithms. Prer., graduate standing.


CSC. 5464-3. Theory of Automata. (MATH. 5446.) Studies the relationships between classes of formal languages (regular, context-free, context-sensitive, phrase-structure) and classes of automata (finite-state, pushdown, turing machines). Additional topics include decidability and computability issues. Prer., CSC. 3401 and MATH. 3000 or 3010.


CSC. 5552-3. Nonnumerical Techniques for Digital Computers. A study of the methods used for implementing processors for numerical problems such as artificial intelligence, dynamic storage allocation, list processing, recursive programming, and search. Special purpose languages such as LISP and Prolog will be studied along with their implementations. Prer., CSC. 3415.

CSC. 5565-3. Translation of Programming Languages. (EE. 5561.) An introduction to the design and construction of compilers: lexical analysis, syntax analysis, semantic analysis, symbol tables, LL (1) grammars, LR parsing, code generation, and error analysis. Prer., CSC. 3401 and 3415; coreq., CSC. 5535.

CSC. 5573-3. Operating Systems. (EE. 5571.) Investigates the logical design and organization of operating systems, and the interactions of their components. Topics will include IO devices, file systems, scheduling, memory management, deadlock, and concurrent programming constructs and languages. Prer., CSC. 3401 and 3415.

CSC. 5582-3. Artificial Intelligence. (EE. 5581.) The design of machines and systems that have been created to perform tasks that are considered to require intelligence. Includes elements of speech, vision, and language understanding systems. Prer., CSC. 5532.

CSC. 5593-3. Advanced Computer Architectures. A broad scope treatment of the important concepts in the structural design of computer systems will be covered by studying unique features of several key computer systems. Techniques used in super computers and a number of advanced architectures will be studied in depth. Prer., CSC. 4531.

CSC. 5606-3, 5616-3. Numerical Analysis II. (MATH. 5660, 5661.) This is a full year, graduate level survey course in numerical analysis. The essential topics of the course include error analysis, direct and iterative methods of solution of systems of linear equations, solution of nonlinear equations and systems of equations, interpolation and approximation, numerical differentiation and integration, numerical solution of ordinary and partial differential equations. Prer., MATH. 3191, 3200, and programming experience.


CSC. 5656-3. Non-Linear Optimization. (MATH. 5665.) This course presents mathematical foundations of optimization with focus on nonlinear forms. Topics include convexity and optimality conditions. Concepts of algorithm design and analysis are developed from these basic topics and elements of fixed point theory. Particular algorithms are considered for unconstrained, linearly constrained, and nonlinearly constrained models. Prer., MATH. 4120.


CSC. 5728-3. Software Engineering. First-hand study of problems connected with

the development of large programs. Small groups of students will be involved in the analysis and design of large software projects. Prer., CSC. 3401 and 3415.

CSC. 580X to 583X-1 to 9. Special Topics (Master's Level). From time to time courses are offered covering recent developments in an aspect of computer science. For graduate students only.

CSC. 6551-3. Parallel Computation and Architectures. This course will examine a range of topics involved in using parallel operations to improve computational performance. Parallel architectures, parallel algorithms, and parallel programming languages will be discussed. Interconnection networks and their relations to specific computer architectures will be covered. Prer., graduate standing and MATH. 4650 or CSC. 4656.

CSC. 6930-variable credit. Master's Thesis.

CSC. 8990-variable credit. Doctoral Thesis.

Independent Study

CSC. 484X-variable credit. Independent Study (Undergraduate). For seniors majoring in computer science.

CSC. 584X-variable credit. Independent Study (Master's Level).

ELECTRICAL ENGINEERING COURSES

EE. 180X/3X. 280X/3X-1 to 3. Special Topics (Lower Division). Credit and subject matter to be arranged.


EE. 2532-1. Sophomore Laboratory I. Basic electrical circuit measurements and experimentation using oscilloscopes, various meters, and function generators. Experiments in digital logic analysis and design. Prer. or coreq., EE. 2132; prer., CSC. 1510.


EE. 2651-3. Assembly Language and Computer Organization. (CSC. 2525.) Topics include computer architecture.
program execution at the hardware level, programmer's interface to the operating system. Program- ming exercises are assigned in this course. These exercises involve the use of specific hardware in designated laboratories. Prereq., CSC. 1410 and 1510.


EE. 3133-3. Electromagnetic Fields I. Maxwell's equations postulated for free space and developed for material regions: boundary conditions. Uniform plane waves. Static and quasi-static electric and magnetic fields. Prereq., EE. 2142 and MATH. 3020 or 3191.


EE. 3225-3. Electronics II. BJT and FET models at high frequencies, multi-stage amplifiers, frequency response of amplifiers, feedback, operational amplifiers, oscillators, power amplifiers, and introduction to power electronics. Prereq., EE. 3215.

EE. 3316-3. Linear System Theory. Analysis of linear systems by the use of transfer functions, impulse response, step-function response, and convolution. Consideration of both continuous and discrete systems using linear differential equations and linear difference equations as models. Applications to electric circuits and systems. Transform techniques including the bilateral Laplace transform, Fourier transform, and Z-transform. Introduction to state variable methods for both continuous and discrete systems. Prereq., EE. 2142; MATH. 3020 or (MATH. 3191).

EE. 3511-3. Computer Interfacing. This course covers the use of the computer as a component in instrumentation and signal processing systems. Topics covered include high-level/low-level language interface, hardware device drivers, data acquisition and signal conditioning, serial/parallel communications, plus signal processing and computer display techniques. Prereq., CSC. 1410, 1510, and 2525 (or EE. 2651).

EE. 3651-3. Digital Hardware Design. The specification and design of digital hardware using medium scale, large scale, and very large integrated circuits. Technology of TTL, MOS, and ECL logic families. Combinational and sequential logic. Prereq., CSC. 1510 and 2525 (or EE. 2651).

EE. 3715-1. Electronics Laboratory. Design and experimentally verify operation of filter circuits, power supply circuits, transistor amplifier circuits, and FET circuits. Prereq., EE. 2542; Prereq. or coreq., EE. 3215.

EE. 3724-1. Power Laboratory I. Basic electro-mechanical energy conversion concepts as applied to the synchronous machine, induction machine and d.c. machine; the transformer; applications. Prereq., EE. 2542. Prereq. or coreq., EE. 3164.

EE. 3753-2. Junior Laboratory. Design and measurement of several nonlinear or amp circuits, a single-stage amplifier, and a complementary-symmetry output stage. Prereq. or coreq., EE. 3225. Prereq., EE. 3715 and CMMU. 2101.

EE. 380X/3X, 480X/3X-1 to 3. Special Topics (Upper Division). Credit and subject matter to be arranged.


EE. 4191-1. Cooperative Education. Faculty/employer supervised employment in industry. Enrollment is limited to students who fully complete a Contract for Cooperative Education Credit by the last day of the drop/add period. Prereq., EE. 2142.


EE. 4174-3. (P) Industrial Power Electronics. Power electronics fundamentals and applications in power systems: SCR; power diodes; JFET, FET and GTO; converter design; HPM motors; motor speed control and applications. Prereq., EE. 3164, 3225, 3724, and 3735.


EE. 4247-3. (C) Communication Theory. Introduction to the principles of traditional analog and modern digital communication systems. The spectral density of random signals is used to compare the noise performance of AM, FM, and various digital modulation methods such as phase shift keying. Discussion of information and the channel capacity of transmission systems. Prereq., EE. 3316 and 3817 (or MATH. 3810).


EE. 4309-2. Senior Design Seminar. The focus is the design process itself. Included are economic and reliability considerations. Students are formed into design groups. Each group works with the project's sponsor to organize the project and agree upon its specifications. A written report is required of each student. The project will be completed in EE. 4319. Prereq., EE. 3143, 3164, 3225, 3316, and 3735; no more than one of these may be taken as a co req.

EE. 4319-3. Senior Design Project. Completion of the design project initiated in EE. 4309 including written and oral presentations. Prereq., EE. 4309.

EE. 4406-2 (S) Control Systems Laboratory. Independent design projects in servomechanism control. Design of PID position and velocity controllers by classical methods. Design of modern control systems using digital computer. Prereq., EE. 3225 and 3735; Prereq. or coreq., EE. 4136 or 4276.

EE. 4411-2 (D) Computer Systems Laboratory. This laboratory provides students with experience in the use of microprocessors as a component in larger systems. Topics include microprocessor logical organization, interfacing, timing, and programming. Prereq., EE. 2651, 3225, and 3735.

EE. 4423-2. (P) Microwave Laboratory. Microwave design and matching of coaxial and waveguide devices, transmission lines, and systems. Devices include attenuators, directional couplers, antennas, ferrites, detectors, mixers, oscillators, and amplifiers. Systems are represented by modern X band transceivers and multiband satellite systems. Project in microwave computer-aided design
of microwave transistor amplifiers. Prer., EE.
3143, 3225, and 3735.
EE. 4435-2 (E) Advanced Electronics
Laboratory. Projects related to digital logic,
analog and digital switches, A/D and D/A
converters, and design of signal filters. Prer.,
EE. 3225 and 3735; prer. or coreq., EE. 4225.
EE. 4444-2 (P) Power Systems Labora-
tory. Power laboratory system utilized
to investigate the design, testing, and operation
of standard distribution system apparatus,
including synchronous machines, induction
machines, transformers, power rectifiers, cir-
cuit breakers, fuses, and instrumentation.
Preparation of a report of a power systems
related topic and oral presentation to class.
Tours of local power facilities and class
presentations by local power systems design
engineers. Prer., EE. 3164 and 3724; coreq.,
EE. 4184 or 4174.
EE. 4453-2 (f) Electro-Optics Labora-
tory. Lasers, light emitters, detectors,
polarization effects upon reflection and
refraction. Diffraction, interference, imaging,
spatial filtering. Optical modulation, detec-
tion. Projects are selected from fiber optics,
electro-optical system, optical communica-
tions, acousto-optical effects. Prer., EE.
3143, 3316, and 3735.
EE. 4467-2 (C) Communications
Laboratory. Analysis and design in three
main areas: traditional analog communica-
tions at low and medium frequencies, digital
communications, and microwave communica-
tions systems. Extensive use of spectrum
analysis from low frequencies up to micro-
wave range. Projects include noise, AM, FM,
PM, PLL, sampling quantizing/encoding,
TDM, FSK, QPSK, 16 QAM, transceivers and
satellite communications systems. Prer., EE.
3225, 3735, and EE. 3316.
EE. 4591-3 (D) Computer System
Design. The design of computer systems
using off-the-shelf microcomputers and
micro-processors. The emphasis is on the
architectural features of modern computer
systems and on the design of micro-
processor/microcomputer based systems
implementing those features. Topics covered
include: CPU architecture, processor selec-
tion, bus structures, memory management,
virtual memory, bus peripherals, user inter-
dface, data communication and multi-
processor systems. Prer., EE. 2142 (or 3030)
and EE. 2651.
EE. 4601-2 (D) Computer Laboratory.
(Replaced by EE. 4411.)
EE. 4615-2 (E) Electronics Laboratory
III. (Replaced by EE. 4435.)
EE. 4633-2 (F) Transmission Labora-
tory. Experiments concerned with transmis-
sion lines and waveguide systems using
slotted lines, bolometer power bridges, cavity
frequency meters, and crystal detectors.
The artificial line. Use of time domain reflect-
tometers, directional couplers, and hybrid
tees. Sub impedance matching, Antenna
and antenna array patterns. Prer., EE. 3143
and 3735.
EE. 4939-1. Cooperative Education.
Faculty/employer supervised employment in
industry. Enrollment is limited to students
who fully complete a Contract for
Cooperative Education Credit by the last
do of the drop/add period. Prer., EE. 3735.

GRADUATE COURSES

The department offers between 10 and
12 graduate courses each fall and each
spring. Check the department office for a
tentative listing of offerings for future
semesters.

Note: Most 5000-level graduate courses
are open to qualified undergraduates to
meet the requirements for technical or
professional electives under the prior
curriculum.

To register for 5000-level courses, an
undergraduate must be a senior with a B
average or have consent of the department.

EE. 5134-3. (F) Electromagnetic Radia-
tion. Incoherent radiation, including the
black body radiation law, is studied first,
concluding with derivation of some of the fun-
damental antenna laws. Radiation from
electrical charge in motion is considered
next. Then these concepts are specialized to
broadly applicable formulations for radiation
and impedance characteristics of several
types of antennas and antenna systems.
Prer., EE. 3143 or equivalent.
EE. 5163-3. (F) Microwave Devices and
Systems. Circuit theory is applied to
waveguide systems containing filters and
other passive devices for micro- and
millimeter waves. Non-reciprocal ter-
rmadic devices like circulators and
isolators are treated. Non-linear microwave
components include Schottky barriers,
avanching, and tunneling in the semi-
conductors and superconductors. Manley Rowe
equations are solved for active varactor
device like paramaps and converter. Design
concepts of microwave systems for bioelec-
tromagnetics, satellite communications, radar
and radiometry. Prer., EE. 3143.
EE. 5183-3. (F) Bioelectromagnetics.
Exposure of man to electromagnetic waves
from communications, radar, microwave
heating, and medical systems. Propagation of
waves in biological materials including sub-
cutaneous penetration, thermal and nonther-
mais effects. Safe exposure limits. Naturally
emitted fields of the human body. Medical
applications studied include electro-
and magneto-encephalography and cardiography,
magnetic resonance imaging, diathermy,
hyperthermia, microwave- and infrared-
themogrophy. Prer., EE. 3143.
EE. 5210-3. Numerical Methods for
Engineers. (ME. 5110.) An introduction to
numerical analysis. Solution of linear and
nonlinear equation systems. Numerical
methods for ordinary and partial differential
equations. Engineering applications. Prer.,
MATH. 3020 and CSC. 1100 (or 1410).
EE. 5220-3. Methods of Engineering
Analysis I. (ME. 5210.) Selected topics from
real analysis with applications to engineering
analysis. Topics include ordinary differential
equations, special functions, partial differen-
tial equations, and boundary value problems.
Prer., graduate standing or consent of
instructor.
EE. 5230-3. Methods of Engineering
Analysis II. (ME. 5130.) Selected topics in
complex analysis with applications to engi-
neering analysis. Topics may include basics
of complex variables. Complex functions,
complex integration, conformal transforma-
tions with applications as appropriate. Prer.,
graduate standing or consent of instructor.
EE. 5436-3. (S) Nonlinear Control
Systems 1. Analysis and synthesis of non-
linear feedback control systems. Linearization
and stability in the small. Equivalent linearization
and the describing function. The
dual input describing function. Stability
in the large and the second method of
Lyapunov. Stability of time-varying systems.
Popov's method and extensions. Prer.,
EE. 4136 (or 4276).
EE. 5446-3. (S) Introduction to Modern
Control Theory. Introduction to modern
control theory. State space representation
of dynamic systems. Canonical forms. Fre-
quency domain analysis. Controllability and
observability. Design by state space methods:
pole-placement. Linear observers separation
principle. Robustness. Linear, quadratic
optimum control. Prer., EE. 4136 or 4276.
EE. 5456-3. (S) Sampled Data and Digital
Control Systems. Sampled data and digital
control systems. Elements of sampling
theory. Overview of design approaches via
transform methods. Analysis and design in
state space. Optimal control systems.
Emphasis will be placed on computer aided
design projects. Prer., EE. 4276.
EE. 5496-3. (S) Adaptive Control System
Design. Basic concepts in adaptive feedback
control. Overview of application areas.
Elements of stability analysis and hyperstability
approach to the design of adaptive
systems. Positivity concept. Topics in
modern adaptive control such as model
reference adaptive systems, self-turning
regulators, adaptive control of uncertain
plants, and neurodynamic adaptive systems.
Emphasis will be placed on design projects.
Prer., EE. 4136 or 4276.
EE. 5476-3. (S) Optimal State Estimation.
The continuous and discrete variational
calculus, the maximum principle, and the
Hamilton-Jacobi theory will be studied. The
optimal state estimation and combined
estimation and control, such as the linear
quadratic Gaussian problem, will be
presented. Optimal system control problems
will be treated. Prer., EE. 4136 (or 4276).
EE. 5486-3. (S) Modeling and System
Identification. Linear time-invariant and
time-varying models. Non-linear state space


EE. 5511-3. (D) Hardware-Software Interface. Computer engineering methods in hardware and software design applied to problems drawn from the mini- and microcomputer systems field. Hardware and software techniques will be compared and related, and general techniques for the design of a combined hardware-software system will be developed. Interface between a computer system and external digital devices will be developed. Real time programming techniques are considered. Prer., EE. 4591 or 4411.


EE. 5561-3. Translation of Programming Languages. (CSC. 5565.) An introduction to the design and construction of compilers. Lexical analysis, syntactic analysis, semantic analysis, symbol tables, LL (1) grammars, LR parsing, code generation, and error analysis. Prer., CSC. 3401 and 3415; coreq., CSC. 5535.

EE. 5571-3. (D) Operating Systems. (CSC. 5573.) Investigates the logical design and operation of operating systems, and the interactions of their components. Topics will include I/O devices, file systems, scheduling, memory management, deadlocks, and concurrent programming, constructs and languages. Prer., CSC. 3401 and 3415.

EE. 5581-3. (D) Artificial Intelligence. (CSC. 5582.) The design of machines and systems created to perform tasks that are considered to require intelligence. Languages for artificial intelligence programming, expert systems, sensors and patterns, and applications are considered. Prer., CSC. 4034 or 3415.

EE. 5591-3. (D) Advanced Computer Architecture. A broad-scope treatment of the important aspects of the structural design of computer systems will be covered by studying unique features of several key computer systems. Techniques used in supercomputers and a number of advanced architectures will be studied in depth. Prer., EE. 4591.

EE. 5617-3. (C) Noise and Random Processes. Brief review of probability theory; sequences of random variables, specification of stochastic processes, stationary, correlation functions and spectral densities, linear mean-square estimation, nonstationary random processes. Prer., EE. 3316 and 3817 (or MATH. 4810).


EE. 5657-3. (C) Detection and Extraction of Signals from Noise. Introduction to detection and extraction methods used in signal processing. Decision theory, detection of known and random signals, optimum receiver design, estimation theory. Wiener filtering, Kalman-Bucy filtering, applications to communication systems. Prer., EE. 5517.

EE. 5687-3. (C) Optical Communication Systems. Systems aspects of optical communication system design. Basic principles of sources, channels, detectors, amplifiers, and coding with regard to the performance limitations they place on the communication system. Prer., EE. 3143, 4247; EE. 5517 recommended.


EE. 5724-3. (P) Energy Systems Analysis II. Application of symmetrical components to faults on transmission systems, determination of system constants, measurement of sequence quantities, relaying philosophies, power-flow studies; computer methods in power systems. Prer., EE. 4184.


EE. 580X/3X, 680X/3X-1 to 3. Special Topics (Master's Level). Credit and subject matter to be arranged.


EE. 780X-783X-1 to 3. Selected Topics. (Doctoral Level). Courses of variable title and variable credit, usually offered once by guest lecturers. See current departmental notices for details.

EE. 899X-variable credit. Doctor's Thesis.

Independent Study

EE. 284X, 384X, 484X-1 to 3. Independent Study (Undergraduate). An opportunity for students to do independent, creative work. Prer., consent of instructor. EE. 584X-1 to 6. Independent Study (Master's Level). Affords an opportunity for students to do independent, creative work. Prer., consent of advisor.

EE. 784X-1 to 6. Independent Study (Doctoral Level). Affords an opportunity for students to do independent, creative work. Prer., consent of advisor.
MECHANICAL ENGINEERING

Chair: R. Wayne Adkins
Staff Assistant: Faye Waitman
Office: NC 3502
Telephone: 556-8516
Faculty: Professors: R. Wayne Adkins, William H. Clohessy, James C. Gerdeen
Associate Professors: B. Thomas Arnberg, J. Kenneth Ortega, John A. Trapp

Undergraduate

The mechanical engineer is a professional person concerned with satisfying the needs of society using a combination of material, human, and economic resources. Mechanical engineering covers a very wide spectrum of activities in the engineering profession. These activities include the conversion and transmission of energy and associated power processes; the kinematic, dynamic, strength, and wear considerations as well as economic aspects of the development, design and use of machines and processes; the analysis, synthesis, and control of entire engineering systems.

The mechanical engineering curriculum begins with a strong emphasis on mathematics, physics, and chemistry. It continues with a concentration in engineering sciences including solid and fluid mechanics; thermodynamics, heat and mass transport; materials; and systems analysis and control. It concludes with laboratory and design courses which demonstrate the ways in which scientific knowledge is applied in the design and development of useful devices and processes.

The mechanical engineering program may be roughly subdivided into two-year groupings. In the first two years, the program emphasizes the fundamentals of mathematics and basic science that are essential for an understanding of most branches of professional engineering. In the last two years of the program, the department emphasizes engineering science and design and provides technical electives in the following areas:

- Thermodynamics
- Heat Transfer
- Fluid mechanics
- Solid mechanics
- Power
- Dynamics and controls
- Design
- Thermomechanical systems

To be awarded the B.S. (M.E.) a student must satisfy all University graduation requirements and maintain at least a 2.0 in all mechanical engineering courses. All students are required to set up an appointment with the senior check-out advisor before registering for the last 30 hours of their degree program.

Typical Curriculum for B.S. (Mechanical Engineering)

FRESHMAN YEAR

Fall Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH. 1401. Analytic Geometry and Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM. 1130. Engineering General Chemistry (see note 1)</td>
<td>5</td>
</tr>
<tr>
<td>CSC. 1100. Introduction to Computing</td>
<td>3</td>
</tr>
<tr>
<td>Humanities and social sciences elective (see note 2)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

Spring Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH. 2411. Analytical Geometry and Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS. 2311. General Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS. 2321. General Physics Lab I</td>
<td>1</td>
</tr>
<tr>
<td>ENGR. 1025. Graphics and Computer Aided Design</td>
<td>3</td>
</tr>
<tr>
<td>ENGL. 1020. Writing Workshop II (see note 5)</td>
<td>3</td>
</tr>
<tr>
<td>Humanities and social sciences elective (see note 2)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
</tr>
</tbody>
</table>

SOPHOMORE YEAR

Fall Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH. 2421. Analytic Geometry and Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>PHYS. 2331. General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS. 2341. General Physics Lab II</td>
<td>1</td>
</tr>
<tr>
<td>Humanities and social sciences elective (see note 2)</td>
<td>3</td>
</tr>
<tr>
<td>ME. 2023. Statics (see note 3)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

Spring Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH. 3020. Elementary Differential Equations and Linear Algebra</td>
<td>4</td>
</tr>
<tr>
<td>ME. 2033. Dynamics (see note 3)</td>
<td>3</td>
</tr>
<tr>
<td>EE. 3030. Electric Circuits and Systems</td>
<td>3</td>
</tr>
<tr>
<td>ENGR. 3012. Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>Humanities and social sciences elective (see note 2)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

JUNIOR YEAR

Fall Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME. 3024. Introduction to Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME. 3022. Thermodynamics II</td>
<td>3</td>
</tr>
<tr>
<td>ME. 3017. Measurements</td>
<td>2</td>
</tr>
<tr>
<td>ME. 3020. Engineering Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Spring Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME. 3037. Measurements Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>ME. 4024. Mechanical Behavior of Materials</td>
<td>3</td>
</tr>
<tr>
<td>ME. 3123. Vibration Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ME. 3065. Introduction to Mechanisms</td>
<td>3</td>
</tr>
<tr>
<td>ME. 3034. Properties of Engineering</td>
<td>1</td>
</tr>
<tr>
<td>ME. 3031. Fluids/Thermal Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>Humanities and social sciences elective (see note 2)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

SENIOR YEAR

Fall Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME. 4026. Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ME. 4025. Mechanical Engineering Design I</td>
<td>3</td>
</tr>
<tr>
<td>Technical electives (see note 4)</td>
<td>4</td>
</tr>
<tr>
<td>Humanities and social sciences elective (see note 2)</td>
<td>3</td>
</tr>
<tr>
<td>ENGR. 4000. Senior Seminar</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

Spring Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME. 4035. Mechanical Engineering Design II</td>
<td>3</td>
</tr>
<tr>
<td>ME. 4027. Mechanical Engineering Lab</td>
<td>3</td>
</tr>
<tr>
<td>Technical electives (see note 4)</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

Notes for B.S. (Mechanical Engineering)

1. CHEM. 2031 and 2038 may be substituted.
2. A minimum of 18 semester hours is required in the areas of humanities, fine arts and social sciences, with at least one course in each of the three areas of study. Two- and three-course sequences also are required in disciplines identified within the above areas of study, with at least one course in the upper division. (See also Humanities and Social Sciences Component in the College of Engineering general information section of this catalog.) These sequences should be selected to address an issue or theme that is of interest to the student. A departmental advisor should be consulted to be sure that all College and departmental requirements are adhered to.
3. CE. 2121 and 3111 may be substituted for ME. 2023 and 2033.
4. A list of approved technical electives is maintained in the department office. The design content of each course is indicated. The technical elective plan of each student must be approved by an
advisor and the plan must contain six hours of design credit. The department will offer at least one technical elective with a full three-hour design credit each semester.

5. A student must pass ENGL. 1020 with a C or better, or pass the equivalency test. If the student passes the equivalency test, then ENGL. 3154 or CMMU. 2101 must be taken to complete the communication requirement.

Graduate

The Department of Mechanical Engineering offers graduate courses and a Master of Science degree program. The degrees of Master of Engineering, and Ph.D. in Mechanical Engineering are offered through a coordinated program with the Department of Mechanical Engineering, University of Colorado at Boulder. The areas of research interest in which a student may undertake studies at CU-Denver include manufacturing processes, fluid mechanics, solid mechanics, heat transfer, bioengineering, thermodynamics, and mechanical design.

DEGREE REQUIREMENTS

At the M.S. degree level, students following Plan I (24 hours of formal course work plus 6 hours of thesis) are required to take 9 hours of core courses which include engineering analysis and a selection from thermodynamics, mechanics, and design. Students following Plan II (30 hours of formal course work) are required to take 15 hours of core courses in thermodynamics, elasticity or fluid mechanics, dynamics, and engineering mathematics. The remainder of the program is developed by the student in consultation with the advisor.

For admission to Ph.D. candidacy the student must pass a comprehensive examination to demonstrate a general competence in mechanical engineering at an advanced level. In addition, second-year college-level reading proficiency must be demonstrated in Scientific French, German, Russian, or other foreign language approved by the department upon petition by the student.

COURSES

ME. 1208-1298-1 to 3. Special Topics.
ME. 2023-3. Statics. (CE. 2121.) A vector treatment of dynamics of particles and rigid bodies including rectilinear translation, central-force, and general motion of particles, kinematics of rigid bodies; the inertia tensor; plane motion of rigid bodies; energy and momentum methods for particles, systems of particles, and rigid bodies. Prer., M.E. 2033.
ME. 2208-2298-1 to 3. Special Topics in Mechanical Engineering and Mechanics. Subject matter to be selected from topics or current technological interest. Credit to be arranged. Prer., consent of instructor
ME. 3024-3. Introduction to Materials Science I. The development of the physical principles relating the structural features of materials to their observed properties. Prer., PHYS. 2311 and 2321.
ME. 3031-1. Fluids-Thermal Laboratory. Laboratory exercises in compressible and incompressible fluid flow; steady state and transient heat transfer. Prer., ME. 3022; coreq., ME. 3021.
ME. 3034-1. Properties of Engineering Materials. Experiments to determine material properties and the effect of processing on properties important in mechanical design. Materials include metal, polymers, and composites. Loadings include tension, compression, and bending under static, dynamic, impact, and creep states. Prer. or coreq.; ME. 3043 or 3024.
ME. 3037-2. Measurements Laboratory. Self-paced, open laboratory, providing hands-on experience. Includes a variety of instruments and components illustrating fundamental experimental concepts for measurement systems. Prer., ENGR. 3012.
ME. 3208-3298-1 to 3. Special Topics in Mechanical Engineering and Mechanics. Subject matter to be selected from topics of current technological interest. Credit to be arranged. Prer., consent of instructor
ME. 4025-3. Mechanical Engineering Design II. Review of mechanics of materials and stress analysis; detailed design of various machine elements such as fasteners, springs, brakes and gears. Includes design project. Prer., ME. 3024.
ME. 4027-3. Mechanical Engineering Laboratory. Students perform individual projects encompassing designing, planning, testing, and reporting. Oral reports are given bi-weekly and a final written report is required. Prer., ME. 3022; coreq., ME. 3037.
ME. 4035-3. Mechanical Engineering Design II. Capstone design course. Team projects to design engineering components and systems. Design methodology, product specs, creativity, design review, presentations, and report writing are emphasized. Prer., ME. 4025.

ME. 4121-3. Fluid Mechanics. Viscous incompressible fluid flows. Topics include derivation of equation governing viscous compressible fluid motion; specializations to simple flows; boundary-layer theory; similarity solutions; introduction to turbulence and Reynolds stresses. Prer., ME. 3021.

ME. 4122-3. Air Conditioning. Thermodynamic laws of water vapor and air mixtures; basic principles of heating and ventilating; determination of heating and cooling loads; design of heating and cooling systems. Includes design project. Prer. or coreq.; ME. 3042.

ME. 4130-3. Analytical Methods of Engineering II. Foundations of complex analysis applied to engineering problems. Subjects may include complex functions, complex series, complex integration (contour integration), conformal transformations and selected applications. Prer., MATH. 3020 or 3191 and 3200, or consent of instructor.


ME. 4135-3. Mechanical Systems Design. Detailed engineering design of mechanical systems. Students work in teams on a project selected for entire class. Projects are similar to typical ones from industry. Course stresses creativity, synthesis, design judgement, and analysis of real world problems. Oral and written presentation are required. Prer., ME. 4025.


ME. 4155-3. Air Conditioning Design. Design and layout of heating, ventilating, air conditioning systems. Prer., ME. 4122 or consent of instructor.

ME. 4160-3. Introduction to Operations Research. Introduction to operations research including mathematical programming models, models for decision alternatives and for procurement and inventory and also for queuing operations. Prer., MATH. 3020.

ME. 4162-3. Energy Conversion. World energy sources and reserves; conventional steam and gas power cycles and equipment; nuclear, solar, and alternative energy systems; advanced concepts of combined cycles and cogeneration. Includes design project. Prer., ME. 3022.


ME. 4208-4298-1 to 3. Special Topics in Mechanical Engineering and Mechanics. Subject matter to be selected from topics of current technological interest. Credit to be arranged. Prer., consent of instructor.

Note: Courses at the 5000 level are open to qualified seniors subject to departmental approval. Not all graduate courses are offered each year.


ME. 5120-3. Methods of Engineering Analysis I. (EE. 5220.) Selected topics from real analysis with applications to engineering analyses. Topics include ordinary differential equations, special functions, partial differential equations and boundary value problems. Prer., graduate standing or consent of instructor.

ME. 5121-3. Introduction to Fluid Dynamics. Physical properties of gases and liquids; kinematics of flow fields; equations describing viscous, heat conducting Newtonian fluids. Exact solutions and rational approximations for low and high speed dissipative flows, surface and internal waves, acoustics, stability, and potential flows. Coreq., ME. 5210 and 5123 or equivalent.


ME. 5124-3. Yield-Limited Behavior of Materials. Analysis of material behavior within the “elastic range” with emphasis on the phenomenon of yield and factors that influence it. Introduction to the theory of plasticity; examination of the theory of dislocations; study of strengthening mechanisms in solids. Consideration of various time-dependent but reversible (inelastic) deformation phenomena. Presentation of appropriate engineering case studies to augment various topics. Prer., ME. 4024 or equivalent.

ME. 5130-3. Methods of Engineering Analysis II. (EE. 5230.) Selected topics in complex analysis with applications to engineering analysis. Topics may include basics of complex variables, complex functions, complex integration, conformal transformation, probability functions, approximations with applications as appropriate. Prer., graduate standing or consent of instructor.


ME. 5144-3. Plasticity and Creep. Inelastic deformation of materials such as metals, alloys, glasses, composites, polymers etc., from the phenomenological and structural point of view. Case studies of plastic and creep deformations in engineering materials. Prer., ME. 4124 or equivalent.

ME. 5153-3. Advanced Strength of Materials. Review of basic equations governing a linear elastic material and associated boundary-value problems. Deduction of
approximate theories for elementary structures with techniques of solution of resulting practical problems. St. Venant torsion. Prer., ME. 3043 or equivalent.

**ME. 5161-3. Compressible Flow.** Energy, continuity, and momentum principles applied to compressible flow; one-, two-, and three-dimensional subsonic, supersonic, and hypersonic flows. Normal and oblique shocks; method of characteristics. Prer., ME. 5121 or equivalent.


**ME. 5163-3. Dynamics.** Elements of vector analysis, particle motion, kinematics of a rigid body, rotating axes, rigid body motion, and Euler's equations and applications. Introduction to analytical mechanics. Hamilton's principle, Lagrange's equations for holonomic and non-holonomic systems. Prer., graduate standing or consent of instructor.


**ME. 6163-3. Advanced Dynamics.** Tractable problems or particle and rigid body dynamics. Dissipative and non-holonomic systems. The principle of least action, Hamilton-Jacobi equation, small amplitude vibration theory. Prer., ME. 5163.

**ME. 7208-7298-1 to 4. Selected Topics.** Credit and subject matter to be arranged. Advanced graduate-level courses are available upon demand in the following subjects: theory of plates, theory of shells, theory of hydrodynamic stability, advanced continuum mechanics. Outlines of these courses are available in the departmental office.

**Independent Study**

**ME. 484X-1 to 3. Independent Study (Undergraduate).** This category is intended for upper division level special topics which students may wish to pursue on their own initiative, with guidance from a professor who agrees to limited consultation on the work and to award credit when the project is completed.

**ME. 5840-1 to 3. Independent Study (Master's Level).** Available only through approval of the graduate advisor. Subjects arranged to fit needs of the particular student. Prer., graduate standing.

**ENGINEERING — NON-DEPARTMENTAL**

**Undergraduate**

The following courses are offered as required for the various degree programs (see the typical curricula for degree programs as listed in previous College of Engineering sections).


**ENGR. 4000-0. Senior Seminar.** Offered each fall and spring semester. Required of all CE, EE, and ME majors graduating May 1990 and thereafter. Each student shall take the state administered Engineer-in-Training examination. Optional lectures to review topics covered on the E.I.T. exam. This course must be taken in the semester prior to the semester of graduation. Prer., senior standing.

**ENGINEERING, MASTER OF**

The Master of Engineering degree program is administered by the system-wide Graduate School through the departments of engineering. The requirements for admission and for quality and quantity of academic work are essentially the same as for the Master of Science degree awarded in the College of Engineering and Applied Science.

The principal difference between the Master of Engineering degree and the Master of Science degree is that the Master of Engineering is intended especially to meet the needs of those practicing engineers who wish to follow an integrated, interdisciplinary program of studies in engineering or in engineering and allied subjects related to the individual student's professional work. Examples of such interdisciplinary programs include engineering and business administration, engineering and social sciences, engineering and biological sciences, engineering and public administration. Appropriate non-engineering course work must be available on the campus where the student attends.

The degree will be especially valuable for continuing education programs for engineers in industry. It will provide a framework for such persons to work toward significant goals fitted to their particular interests. The program can include courses which are made available on video tape or on live television.

The Master of Engineering degree is not intended as a means to permit a random, unguided selection of courses. Each prospective student is required to present a well-defined objective in order to be admitted to the program. In consultation with the faculty advisors, an academic program is developed to meet this objective.

The admission of students to graduate study, the approval of their degree programs, admission to candidacy for the degree, and the approval of the awarding of a degree are to originate through a specific department of the College of Engineering and Applied Science, in the same manner as for the Master of Science program. An advisory committee, will be appointed for all students by their department. The advisory committee guides the student, and is responsible for approving the individual's degree program and admission to candidacy; and approves the student's written report and the awarding of the degree.

**Degree Requirements**

The requirements for the degree are 30 credit hours plus a written report on a creative investigation which may be related to the student's professional work. The report will be of the same general quality as that required for the Master of Science thesis and must be defended orally. It may be based upon work done for credit under independent study.
least 15 credit hours must be in engineering at the 5000 level or above. As many as 15 credit hours may be taken outside of engineering. Credit in courses below the 4000 level will not apply toward degree requirements.

Additional information about the degree may be obtained from the College of Engineering and Applied Science department offices.
College of Liberal Arts and Sciences

Dean: Marvin D. Loflin
Administrative Officer: Sheryl Bain
Associate Deans: John Lanning, Carolyn Simmons
College Administrative Office: DR,
First Floor
Administrative Office Telephone: 556-2557
College Advising Office: NC 2024
Advising Office Telephone: 556-2555
Community Advisory Council, 1989-90
Ed Alexander, Health Care Consultant,
Alexander Lucey, Inc.
Kay H. Barnett, Personnel Analyst, Personnel Department, State of Colorado
Gerry G. Boyle, Esq., Labor Lawyer,
Hornbein, MacDonald and Fattor
Stephen Coonts, Esq., Lawyer and Novelist
Eugene L. Copeland, Esq., Lawyer and Senior Vice President of Security Life Center
Claudia Czajkowski, President, One Hour Optical
Mary DeGroot, City Councilwoman
Mary Lynn Demis, American Institute of Banking
Susan Duncan, Former Denver Election Commissioner
William W. Grant, Chairman of the Board, Colorado National Bank
Carl Miller, Political Editor, The Denver Post
Jerome K. Nagel, Retired from R.N.L., P.C.
(Architecture and Urban Planning)
Lael Porter, CU-Denver Alumna
Claire Villano, Director of Consumer Fraud, Office of the District Attorney
Jon J. Walkwitz, Esq., Staff Attorney, Colorado Court of Appeals

INFORMATION ABOUT THE COLLEGE

The beauty of an education in the liberal arts is in its simultaneous diversity and specialization. Its effectiveness and power are in the scholarship and talent of its faculty and students. Students in the College are able to both specialize in a major such as chemistry, fine arts, or psychology and experience the integration of knowledge through general education requirements.

The broad educational foundation of the arts and sciences prepares students to begin or to change careers in mid-life, to pursue advanced study in a discipline, or to study for a professional career such as law or medicine and, in general, to lead a rewarding and productive life. The liberal arts curriculum helps students increase substantive knowledge, learn such skills as logical argument and clear expression, gain insights about relationships in nature and society, develop critical thought and interpretive ability, solve complex problems rationally, and heighten aesthetic appreciation.

The College of Liberal Arts and Sciences coordinates undergraduate programs with CU-Denver's professional schools, through which it is possible to combine technical expertise with the broad critical and analytical skills essential to complex decision making. A dedicated faculty with strong academic credentials is committed to highly motivated students representing a broad range of age and experience. The curriculum of the College maintains traditionally high university academic standards while providing numerous flexible learning opportunities to meet the varied objectives of university students from the Denver metropolitan area.

The College’s programs strive to remain close to the needs of the community. The curriculum offers opportunities to study urban programs, confront contemporary issues, participate in off-campus working internships and, in general, make use of the resources of the city. Advisory committees from the community work with each department in the College to strengthen community ties. Cultural and historical efforts in Denver are supported and enhanced by academic programs in the College. Social science disciplines also apply their knowledge to the practical problems of the surrounding community, while the physical sciences are engaged in applied research relating to environmental problems in Denver and Colorado. Many students enroll in the College of Liberal Arts and Sciences to study the liberal arts and participate in the general education associated with the B.A. or B.F.A. degree as an end in itself. After receiving a degree, some students decide to continue study at the graduate level. Others set aside further formal study and initiate careers. Because a liberal education provides a broad foundation in the problem-solving skills and substantive knowledge that can be widely applied, graduates of the College have careers in a variety of positions in industry, commerce, and government. Other students enroll in the College of Liberal Arts and Sciences specifically to prepare themselves for admission to a professional school such as business, education, law, or medicine.

The faculty of the College provide instruction at the undergraduate level through three broad areas of knowledge: arts and humanities, natural and physical sciences, and social sciences. Each area of study offers a wide variety of curricula including traditional undergraduate major programs, interdisciplinary studies, and pre-professional programs. However, in addition to teaching knowledge and skills requisite to achievement in the disciplines of the liberal arts, the faculty of the College have the goals of instilling both the love of learning and the tolerance not to block the way of inquiry.

Undergraduate Programs

Students can earn the Bachelor of Arts (B.A.) degree in the following areas.

- Anthropology
- German
- Applied Math/Physics
- History
- Biology
- Mathematics
- Chemistry
- (includes computer science)
- Communication and Theater
- Music (B.S.)
- Economics
- Philosophy
- English
- Physics
- Fine Arts (B.A. or B.F.A.)
- Political Science
- French
- Psychology
- Spanish
- Geology
- Sociology
- Writing

Individually structured majors are available for those students who desire a unique program tailored to meet a specific objective. Interested students should consult the College-wide Interdisciplinary Academic Programs section of this catalog and contact the College Advising Office, 556-2555, for program details.

The College also provides the necessary course work to prepare students for further study and careers in the following health science fields: child health...
associate, dental hygiene, dentistry, medical technology, medicine, nursing, optometry, osteopathy, pharmacy, physical therapy, podiatry, and veterinary medicine.

MINOR PROGRAMS

Most CU-Denver departments have developed minor programs. A minor program is not required for graduation. Students interested in completing a minor should contact the individual departments regarding requirements or the College Advising Office at 556-2555.

DOUBLE MAJORS

Students may graduate with more than one major (e.g., mathematics and French) by completing all requirements for each major.

SECOND DEGREES

Students who have been awarded a bachelor's degree (either from the College or elsewhere) may be granted a second bachelor's degree provided that (a) all general requirements for that degree have been met; (b) the major for the second bachelor's degree is different from the major for the first; and (c) the College and major department residence requirements are satisfied.

DOUBLE DEGREES

Students may earn two degrees from two different schools or colleges at the University of Colorado simultaneously by fulfilling all requirements for both degrees. For example, the College of Business and the College of Liberal Arts and Sciences have a double-degree program leading to a B.S. in business administration and a B.A. in the student's chosen major. The College of Liberal Arts and Sciences requires that a student complete at least 90 liberal arts credits and 150 total credits in order to be granted two bachelor's degrees.

Students planning one of these multiple programs should consult with the College Advising Office at the earliest possible date in order to get approval for a double-degree program.

Graduate Programs

Graduate degree programs offered by the faculty of the College through The Graduate School include the following:

The Master of Arts (M.A.) in:
- Anthropology
- Biology
- Communication and Theatre
- Economics
- English
- History
- Mathematics
- Political Science
- Psychology
- Sociology

The Master of Science (M.S.) in:
- Applied Mathematics
- Chemistry
- Environmental Science
- Technical Communications

The Master of Basic Science (M.B.S.)
The Master of Humanities (M.H.)
The Master of Social Science (M.S.S.)

Significant course work can be taken at the Denver campus in the following master's degree programs:
- Fine Arts
- Geology
- Journalism
- Philosophy

The Doctor of Philosophy (Ph.D.) in:
- Applied Mathematics

Significant course work toward the doctorate is available at the Denver campus in the programs listed below. Students can be resident on the Denver campus studying in these areas in order to take advantage of the multi-campus activities of The Graduate School. It is usually advised that a student complete some course work at another campus of the University.
- Biology
- Chemistry
- English
- Psychology
- Communication

Requirements for Admission

NEW FRESHMEN

Students planning to enter the College of Liberal Arts and Sciences must meet the requirements described in the General Information section of this catalog under Admission Policies and Procedures. Applicants to the College are considered for admission according to the following schedule:

Additionally, students must meet the College requirements for Minimum Academic Preparation Standards (MAPS) instituted by the University of Colorado. Students seeking admission to the College are required to satisfy 15 units of high school level courses in English, foreign language, mathematics, sciences, humanities, and social sciences. Students are eligible for admission to the College with up to two units of deficiency in a foreign language and no more than one additional deficiency in the remaining areas. The College will allow graduation credit toward the bachelor's degree for courses satisfying MAPS deficiencies only if these courses are allowed for graduation credit under current College policy.

TRANSFER STUDENTS

Students who have attended another college or university are expected to meet general requirements for admission of transfer students as described in the General Information section of this catalog. Applicants who have been away from a college environment for a period of time will be considered on the basis of all factors available: high school record, test scores, original college admission status.

If: And: Or Then
Your Rank in High School Class Is Your ACT Composite Is Your Combined SAT Score Is Your Status for Admission Is
Upper½ 23 or higher 1,000 or higher Assured admission
Upper 2/3 18-23 800 or higher Considered on an individual basis
Lower½ Below 18 Below 800 Considered by Admissions Committee

This schedule corresponds to the general requirements described in the General Information section, but more detail is provided here for prospective College of Liberal Arts and Sciences students.
MUSIC AUDITION

All entering freshmen and transfer students in music must complete an audition. Music students should contact the Department of Music, 556-2727, for audition applications.

Academic Policies

Students are referred to the General Information section of this catalog for a description of academic policies that apply to all undergraduate students at CU-Denver. The policies which follow apply specifically to the College of Liberal Arts and Sciences.

Music students should see the section on academic policies in the School of the Arts portion of this catalog.

CU-DENVER/MSC POOLED COURSES

Courses offered by the School of Letters, Arts, and Sciences at Metropolitan State College and by the College of Liberal Arts and Sciences at the University of Colorado at Denver form a common pool of resources available to students at both institutions. Credits earned in common pool courses that meet appropriate academic criteria will apply to the credits required for a bachelors degree from either institution. Students should check with the College and departmental advisors to verify that common pool courses satisfy graduation requirements.

CU-Denver students must satisfy the following restrictions concerning common pool courses:

1. CU-Denver graduate students are not eligible to register for MSC common pool courses.
2. MSC courses will not be included in the University of Colorado grade-point average. MSC courses will appear on the University of Colorado transcript and will count in the hours toward graduation.
3. The last 30 semester hours applied toward the baccalaureate degree must be taken in residence at CU-Denver. MSC common pool courses will not satisfy this residence requirement.

Students who have academic reasons for waiving the common pool restrictions in their major or minor must obtain prior written approval from the department chair.

ACADEMIC ETHICS

Students are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Therefore, the faculty assumes that term papers, reports, studio work, results of laboratory experiments, and examinations submitted by the student represent the student's own work. Students are referred to the Statement of Academic Honesty of the College of Liberal Arts and Sciences, available from the Office of the Dean, for guidance on generally acceptable limits on cooperation in the preparation of academic work, and for a discussion of what constitutes academic honesty.

Academic dishonesty, such as plagiarism or cheating, is a serious charge which, if substantiated, may result in course failure, probation, suspension, or expulsion from the University. The Academic Ethics Committee, composed principally of faculty and students, is charged by the faculty of the College with considering evidence in contested cases, determining guilt or innocence, and assessing penalties. Special rules of the committee, available from the Office of the Dean, have been designed to ensure due process.

ACADEMIC ADVICE AND INFORMATION

Students in the College are expected to assume responsibility for planning their academic programs in accordance with College policies and major requirements. To assist students, the College maintains a College Advising Office, NC 2024, 556-2555. Students are urged to consult with the staff of this office concerning individual academic problems and progress toward their degrees.

As soon as students have determined a major, they should meet with a department advisor. The department advisor will be responsible for the student's major advising and for certification of the completion of the major program for graduation.

Students planning to earn a degree from one of the professional schools should see an advisor in that school. Each professional school has certain specific requirements. Preprofessional health science students should see the Health Careers Advisor during their first year in the College. For further information contact 556-2555.

The College has a prelaw advisor for CU-Denver students who are interested in careers in law. This advisor has a library of law school catalogues, prelaw handbooks, and other relevant documents, advises individual students, interviews students who need to secure a dean's letter for application to certain law schools, and sponsors meetings at which information of interest to prelaw students is shared. Students may contact the prelaw advisor through the College Advising Office, 556-3396.

Career counseling is available to all students in the College. Assistance in skills analysis, resume preparation, and career exploration is available through the College Advising Office, 556-2555.

ACADEMIC PROBATION AND SCHOLASTIC SUSPENSION

Good academic standing in the College requires a cumulative grade-point average (GPA) of 2.0 on all University of Colorado course work. Grades earned in another college or school within the University of Colorado are used in determining the student's scholastic standing and progress toward the degree. However, grades earned at other institutions are not used in calculating the grade-point average at the University of Colorado.

Academic Probation

Students whose cumulative grade-point average falls below a 2.0 at the end of an academic term will be placed on academic probation for the following semester. Students on academic probation will be informed in writing concerning a minimum 2.2 grade-point requirement. Students must continue to meet the required grade-point average of 2.2 each semester until their cumulative grade-point average is at least a 2.0. At that time students will be removed from probation.

Scholastic Suspension

Students on academic probation who do not meet the 2.2 minimum required grade-point average in the succeeding semester will be suspended from the College. Students are informed in writing of scholastic suspension.

In attempting to raise a grade-point average while suspended, a student may register for courses in the University of Colorado summer term on any campus, for correspondence study through the University, or for credit courses offered through the Division of Extended Studies.

First Suspension

The normal period of suspension is two regular semesters (one academic year excluding summer term), after which the
PETITIONING FOR SPECIAL REQUESTS OF EXCEPTIONS TO STANDING ACADEMIC POLICY

The Academic Standards Committee is responsible for the administration of the academic policies of the College as established by the faculty. This committee constitutes the bridge between the faculty in its legislative capacity and the students upon whom the legislation comes to bear. The committee alone is empowered to grant waivers of exemptions from and exceptions to the academic policies of the College. Students wishing to submit a petition to the committee should meet with the advising staff first to discuss the petition.

Procedures for appealing a grade before the Academic Standards Committee are available for review in the College Advising Office.

The Office of Admissions and Records establishes deadlines each semester for registering, adding courses, dropping courses, selecting the pass/fail option, and withdrawing from the University. These deadlines are clearly identified in each term’s Schedule of Classes. Students seeking to waive these deadlines must petition the associate dean of the College. Instructions for deadline petitions are available from the College Advising Office, 556-2555.

COURSE LOAD

The normal full-time course load for students is 12 to 18 credit hours each semester. Students registered for fewer than 12 hours are regarded as part-time students. Students desiring to register for 19 hours or more must obtain approval from the associate dean. The designation as a part-time student depends only upon courses taken for credit in the University or interinstitutionally with another college. Correspondence courses and noncredit courses are not included in the course load. To receive credit, the student must be officially registered for each course.

For the summer term, 8 credit hours is considered full time. Students registering for more than 13 hours must obtain approval from the associate dean. Since the summer courses vary from 5 to 10 weeks in length, the recommended course load can be substantially less than in the fall and spring semesters.

Students who are employed while enrolled in the College should register for course loads they can expect to complete without unusual difficulty. Recommended course loads for working students are given in the table below; however, students must assess their own abilities, course requirements, employment responsibilities, and family obligations in determining an appropriate course load. The College assumes that all courses selected will be completed.

<table>
<thead>
<tr>
<th>Employment (hr/wk)</th>
<th>Course Load</th>
<th>Course Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-20</td>
<td>9-12</td>
<td>6-8</td>
</tr>
<tr>
<td>20-40</td>
<td>6-9</td>
<td>3-6</td>
</tr>
<tr>
<td>40+</td>
<td>6 or less</td>
<td>3 or less</td>
</tr>
</tbody>
</table>

EARNING ACADEMIC CREDIT — SPECIAL OPTIONS

Students in the College may earn credit toward a degree for knowledge gained prior to enrollment in the College or for knowledge gained outside traditional college courses. Specific programs by which credit is awarded are described below. In addition, credit may be earned for ROTC. Students should contact the College Advising Office for specific details of these programs.

Hours earned in these special option courses are acceptable for elective credit and will not fulfill College core curriculum requirements. For credit in a student’s major or minor, the appropriate department must be consulted.

Advanced Placement

Students who have taken advanced courses in high school and who have earned high scores on the advanced placement standardized exams may be eligible for university credit. Individual departments establish advanced placement criteria for credit. Students should contact the department advisor or the Admissions Office for specific details concerning advanced placement credit.

Credit by Examination

Students with sufficient experience and knowledge may receive credit for a specific course by taking a comprehensive examination given by the faculty. Students seeking credit by examination should consult with the department advisor concerning department policy and with the Records Office for procedure details. Prior to taking the examination, students must pay tuition costs and fee charges for the course. Students who successfully complete the credit by examination requirements receive credit for the course, but no letter grade.
Cooperative Education

Students seeking academic credit from employment experience should consult the Center for Internships and Cooperative Education section of this catalog.

Correspondence Study

Students in the College of Liberal Arts and Sciences, with the approval of the associate dean, may take work in correspondence study offered by the University’s Division of Extended Studies. A maximum of 30 hours of correspondence work may count toward the degree.

Credit for Courses in the Professional Schools and in Physical Education

Students may count toward the Bachelor of Arts and Bachelor of Fine Arts degrees as many as 24 semester hours of course work from curricula leading to degrees other than the B.A. (business, engineering and applied science, architecture and planning, journalism, and education). College of Liberal Arts and Sciences students desiring elementary or secondary school certification will be allowed to apply up to 15 graduate credits from the certification program of the School of Education as part of their total required hours for the Bachelor of Arts degree. Vocational and technical courses from a two-year program may not be included. Activity courses in physical education, up to a maximum of 8 semester hours, will count toward the 120 hours required for the degree.

Credit for Independent Study

Students who are juniors, seniors, or graduates may register for independent study with the written approval of the appropriate faculty member and associate dean. The amount of credit to be given for an independent study project (not to exceed 6 credits per semester) shall be arranged at the time of registration. A maximum of 12 credits taken on an independent study basis may apply toward the bachelor’s degree. Independent study credit may not be used to satisfy the College core curriculum requirements.

College Level Examination Program (CLEP)

An exciting challenge is available to College of Liberal Arts and Sciences students who want to earn university credit by examination in subject areas in which they have obtained college-level proficiency. Interested students are encouraged to take appropriate subject examinations provided in the College Level Examination Program of the College Entrance Examination Board Testing Service. The College will award credit for the following subjects if a student scores at the 67th percentile:

- American government
- American history
- American literature
- Analyses and interpretation of literature
- Biology
- Western civilization I and II
- Calculus with elementary function
- English literature
- General chemistry
- Introductory psychology
- Micro and macro economics

These hours are acceptable for elective credit only and will not fulfill the core curriculum requirements. For credit in a major, consult the major department advisor.

Summary

Following is a listing of the types of credit and the maximum number of hours that may be earned for nonclassroom work.

<table>
<thead>
<tr>
<th>Types of Credit</th>
<th>Maximum Credit Hours Allowed Toward the B.A. Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Placement Credit</td>
<td>No limit</td>
</tr>
<tr>
<td>College-Level Examination Program (CLEP)</td>
<td>30 semester hours</td>
</tr>
<tr>
<td>Correspondence study</td>
<td>30 semester hours</td>
</tr>
<tr>
<td>Credit by examination</td>
<td>No limit</td>
</tr>
<tr>
<td>Independent study</td>
<td>12 semester hours</td>
</tr>
<tr>
<td>Internship/cooperative education</td>
<td>9 semester hours</td>
</tr>
</tbody>
</table>

Graduation Requirements

Students graduating from the College of Liberal Arts and Sciences must fulfill requirements from the College and from the major department. Residence requirements apply to both College and major requirements. A checklist of graduation requirements is located at the end of this section.

Students graduating with a Bachelor of Science degree in music have different graduation requirements. Music students should consult undergraduate degree requirements in music in the School of the Arts section of this catalog.

STUDENT RESPONSIBILITIES

Students are responsible for knowing the requirements for their degree and for fulfilling these requirements. Upon completion of the College and major requirements, the student will be awarded the appropriate degree.

Undergraduate Core Curriculum — University of Colorado at Denver

The faculty of the College of Business Administration, College of Engineering and Applied Science, and the College of Liberal Arts and Sciences have established a new core curriculum for undergraduate students. Beginning with the Fall 1990 Semester, all undergraduate students entering CU-Denver will be required to complete the undergraduate core curriculum independent of their college or major. Undergraduate students admitted prior to Fall 1990 will have a choice of either the new core curriculum or the requirements of their college in effect at the time of admission to the college.

The new undergraduate core curriculum seeks to provide all baccalaureate students with basic intellectual competencies in mathematics and computation, writing, oral communication, information literacy, and critical thinking. It also requires all students to come to terms with the basic knowledge areas of the natural and physical sciences, behavioral sciences, social sciences, humanities, and arts. Furthermore, the core curriculum promotes an awareness of cultural and racial diversity. The majority of the new core curriculum is designed to be completed during a student’s freshman and sophomore years in order to provide the foundation for specific training in a student’s major discipline.

The new undergraduate core curriculum for CU-Denver is outlined in the table below. Each college may augment the campus core curriculum. For example, the College of Liberal Arts and Sciences may require competency in a foreign language
for the Bachelor of Arts degree. Additionally, a student's major may change the course requirements directly associated with a specific major. For example, engineers may have different core courses in the natural and physical sciences area. Details concerning the core curriculum will be available in the advising office for each college by the beginning of the Fall 1990 Semester. Students should contact their college advising office for core requirements specific to their college and for a list of courses designed to satisfy core requirements.

### CU-Denver Undergraduate Core Curriculum

**1. Intellectual Competencies**

- **Writing/Speech** 9 hours 6-9 hours in English with library component, 3-0 hours in Communication
- **Mathematics** 3 hours any computation course or by examination

**2. Knowledge Areas**

- **Natural and Physical Sciences** 8 hours two courses with laboratory, in one or two disciplines
  - Biology, Chemistry, Geology, and Physics
  - Behavioral Sciences AND Social Sciences 9 hours minimum one course in Behavioral and Social, maximum two in a discipline
- **Behavioral Sciences** 3-6 hours one or two courses in one or two disciplines
  - Anthropology, Communication, and Psychology
- **Social Sciences** 3-6 hours one or two courses in one or two disciplines
  - Economics, Geography, Political Science, and Sociology
- **Humanities** 6 hours two courses in one or two disciplines
  - History, Languages, Literature, and Philosophy
- **Arts** 3 hours
  - Fine Arts, Music, and Theatre
- **Multicultural Diversity** 3 hours one upper division course from approved list

### College Requirements

**LIBERAL EDUCATION PROGRAM: THE CORE CURRICULUM**

The requirements of the College of Liberal Arts and Sciences core curriculum are consistent with those of the University-wide core curriculum. Please see the Advising Office for details.

Beginning Spring Semester 1982, the College established new graduation requirements, called the core curriculum.

*Contact college advising offices for specific courses that meet these requirements.*

Students who have been admitted and taken courses in the College prior to spring 1982 will have a choice of completing their degree programs with either the new requirements or those in effect at the time they were admitted.

In order to qualify for a B.A. or B.F.A. degree from the College of Liberal Arts and Sciences, students must complete the liberal education program which consists of core curriculum requirements, writing and computation proficiencies, and a foreign language requirement.

1. **Core Curriculum.** The College requires course work in each of three broad areas of knowledge: arts and humanities, natural and physical sciences, and social sciences. Students are required to take at least 12 semester hours of core courses in the two broad areas which do not contain the department of their major field. In the area which does contain the department of their major field, students are required to take only 6 semester hours of core course work, but these 6 hours cannot be in the department of the student's major. The total course work required is 30 semester hours distributed as follows:
Courses designated for core curriculum credit have special residence requirements. Appropriate courses completed at another institution before the student is admitted to the College of Liberal Arts and Sciences may apply toward core curriculum credit. Courses transferred into the core curriculum must meet the approval of the advisor in the College Advising Office. 

2. **Composition.** The College requires that students either complete ENGL 1021 taken at the University of Colorado with a grade of C (2.0) or higher, or that they pass an examination demonstrating that they have mastered the elements of writing at this level. Students are expected to have completed this requirement by the time they have passed 60 semester hours. No transfer course will substitute for this requirement.

3. **Computation.** The College requires that students satisfy a computation requirement. There are three ways to do this: (a) by passing an examination (CU-Denver MATH. 1000); (b) by completing any 3-hour mathematics course at CU-Denver numbered higher than 1010, with a grade of C (2.0) or better (or transfer an equivalent course from another school); or (c) by completing with a grade of C (2.0) or better the course in computer application (MATH. 1350). Students are expected to have completed this requirement by the time they have passed 60 semester hours.

4. **Foreign Language.** The College requires elementary proficiency in a foreign language. This requirement is satisfied if the student has completed a Level III, third year, high school course in any classical or modern foreign language. (One full year at the high school level is equivalent to one semester of foreign language study at the college level.) Students who have not met the requirement prior to admission to the College may do so either by completion of a third-semester course in the College, or by demonstration of a third-semester proficiency by examination.

**UPPER DIVISION REQUIREMENT**

Students must complete at least 45 semester hours of upper division work (courses numbered 3000 or higher) to be eligible for the bachelor's degree. Any student may register for upper division courses providing he or she has satisfied the prerequisites or has the approval of the discipline in which the course is offered.

Courses transferred from a community college generally carry lower division credit. Agreements between the University and community colleges in the state of Colorado, however, have resulted in some upper division transfer possibilities. See the transfer guides in the College Advising Office.

**TOTAL CREDIT-HOUR AND GRADE-POINT REQUIREMENTS**

To qualify for the Bachelor of Arts degree in the College of Liberal Arts and Sciences, students must pass at least 120 semester hours with an average of at least 2.0 in all courses attempted at the University of Colorado.

**Major Requirements**

In addition to completing the College requirements outlined above, students in the Bachelor of Arts degree program must declare a major and fulfill requirements of the major department. Department requirements include at least 30 semester hours of work in the major with a grade of C (2.0) or higher and at least 16 semester hours in the major at the upper division level with a grade of C (2.0) or higher. The grade-point average in the major must be at least 2.0. Not more than 48 semester hours in one department may be applied toward the 120 hours required for the Bachelor of Arts degree.

The department is responsible for determining when a student has successfully completed the major requirement and for certifying the completion to the dean of the College.

**DECLARATION OF MAJOR**

It is important that students declare a major as early as possible in order to receive proper advising toward departmental requirements. Students in the College must declare a major by the start of their junior year (greater than 60 hours). Transfer students to the College with junior or senior standing must declare a major in their first semester at CU-Denver. Students failing to comply may be prevented from registering until a major is declared. Students are allowed to change their major at any time.

**Residence Requirements**

A certain minimum number of credit hours must be earned in residence in the College of Liberal Arts and Sciences. It is not the intent of residence requirements to impede the academic progress of any student enrolled in the College. Students may petition the College Academic Standards Committee concerning the interpretation of residence requirements.

All students have College and major residence requirements. Students should check with their major department to ascertain residence requirements for the major. Transfer students into CU-Denver must pay particular attention to residence requirements.

The CLAS core curriculum has special residence requirements, and all students should consult Liberal Education Program: The Core Curriculum in this section of the catalog.

**PROVISION FOR ENTERING FRESHMEN**

The following residence requirements apply to students who are admitted to CU-Denver, or any campus of the University of Colorado, as a first-term freshman.

1. A student must earn the last 30 credit hours while enrolled as a degree student in the College of Liberal Arts and Sciences.

2. Twenty-one of the last 30 semester hours must be in CLAS courses taught by University of Colorado faculty.

**PROVISION FOR TRANSFER STUDENTS**

Residence requirements for transfer students apply to any student transferring credits to CU-Denver from another institution. Students transferring academic credit from Metropolitan State College should see the College Advising Office for special consideration of residence credit. The College Advising Office must be contacted for specific details on residence requirements for transfer students.

1. Students transferring from other institutions of higher education will be evaluated in accordance with established guidelines governing transfer of credit.

2. Transfer students have graduated residence requirements in the areas of
upper division credit and core curriculum credit based on the total number of hours accepted by CU-Denver. The minimum college residence requirements are given below.

**Residence Requirement**

<table>
<thead>
<tr>
<th>Hours</th>
<th>CU-Denver</th>
<th>last 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS hours</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Upper Division hours</td>
<td>15-21</td>
<td></td>
</tr>
<tr>
<td>Core Curriculum hours</td>
<td>6-15</td>
<td></td>
</tr>
</tbody>
</table>

3. A minimum of 30 semester hours must be letter graded as opposed to pass/fail.

**General Requirements**

1. A total of 120 semester hours passed.
2. A 2.0 cumulative grade-point average.
3. A total of 45 semester hours of upper division work (courses numbered 3000 or above).
4. The last 30 semester hours while registered as a student in the College of Liberal Arts and Sciences.
5. A minimum of 30 semester hours with letter grades.

Note: Not more than 48 hours (excluding ENGL 1002, 1010 and 1021) in any one department and not more than 24 hours outside the College can be included in the 120 hours for the B.A. degree.

**LIBERAL EDUCATION REQUIREMENTS**

1. 30 hours of core curriculum courses.
2. Writing or composition requirement.
3. Computation or mathematics requirement.
4. Third semester proficiency in a foreign language.

**MAJOR REQUIREMENTS**

1. 30 to 48 semester hours in major field.
2. A minimum of 30 hours of C (2.0) grade or higher in the major.
3. A 2.0 grade-point average in the major.
4. A minimum of 16 semester hours of upper division courses in the major with a grade of C (2.0) or higher.
5. Special requirements as stipulated by the major department.

**SPECIAL NOTES:**

1. A maximum of 6 semester hours may be completed with a grade of P (on P/F option) and included in the 45 semester hours.
2. All credit courses which are completed through the Division of Extended Studies may be included in the 45 semester hours.
3. In calculating the minimum total of 45 semester hours, part of a semester will not be counted but, instead, all courses in a semester will be included.

**DEPARTMENTAL HONORS**

Most departments in the College offer programs through which students can qualify for Latin honors: *cum laude*, *magna cum laude*, or *summa cum laude*. Determination of the level of honors is made by the department. Detailed information can be obtained from the College Advising Office or from an individual department.

**HONORS IN HUMANITIES**

Students may enroll in a cocurricular program that leads to graduation with Honors in Humanities for those students who complete it with a 3.0 GPA or better. The program is open to all CU-Denver students, but it is specially designed for students majoring in non-humanities disciplines (such as business, engineering, the sciences, and social sciences). This interdisciplinary program acquaints students with the methodologies and knowledge of humanistic studies (art, drama, history, literature, philosophy) and provides advanced training in writing. The program is intended for students interested in the study of the development of human values and their relationship to human experience at large and to scientific and technological knowledge specifically. For detailed information, contact the director of Honors in Humanities, 556-2649.

**DEAN’S LIST**

The College publishes and displays each semester a Dean’s List, honoring students who receive a 3.75 or better grade-point average. To earn a place on the list, students must achieve the 3.75 GPA for the semester, in a minimum of 6 hours in CLAS courses, while taking a load that consists of a maximum of 6 nongraded hours (P, W, I). For details, consult the College Advising Office.

**CENTER FOR INTERNSHIPS AND COOPERATIVE EDUCATION**

**Director:** Janet Michalski  
**Office:** 1047 Ninth St.  
**Phone:** 556-2832

Because experience is often an effective educator, the Center for Internships and Cooperative Education exists to provide students with an opportunity to supplement their classroom learning with on-the-job work experiences related to their academic studies. Students are placed either as paid co-op trainees or volunteer co-op interns with corporations, business, or government agencies in positions that complement their academic studies. Cooperative education offers students:

1. The opportunity to test classroom theory by applying what is learned on campus to a work situation.
2. Early exposure to a variety of professions.
3. Valuable work experience that can lead to a permanent career position upon graduation.

**Summary Checklist of Graduation Requirements**

**GENERAL REQUIREMENTS**

1. A total of 120 semester hours passed.
2. A 2.0 cumulative grade-point average.
3. A total of 45 semester hours of upper division work (courses numbered 3000 or above).
4. The last 30 semester hours while registered as a student in the College of Liberal Arts and Sciences.
5. A minimum of 30 semester hours with letter grades.

Note: Not more than 48 hours (excluding ENGL 1002, 1010 and 1021) in any one department and not more than 24 hours outside the College can be included in the 120 hours for the B.A. degree.

**SPECIAL NOTE:**

Upon completion of 90 semester hours of course work, each student must make an appointment with the College advising staff to determine the student’s status with respect to degree requirements.

When their registration is confirmed for the last semester, students are required to file Diploma Cards, indicating the date they intend to graduate, and Applications for Degree Candidacy. Failure to file a Diploma Card with the College Advising Office will result in delayed graduation. Diploma Cards and Applications for Degree Candidacy are available in the College Advising Office, NC 2024.

**COOPERATIVE EDUCATION**

**Director:** Janet Michalski  
**Office:** 1047 Ninth St.  
**Phone:** 556-2832

Because experience is often an effective educator, the Center for Internships and Cooperative Education exists to provide students with an opportunity to supplement their classroom learning with on-the-job work experiences related to their academic studies. Students are placed either as paid co-op trainees or volunteer co-op interns with corporations, business, or government agencies in positions that complement their academic studies. Cooperative education offers students:

1. The opportunity to test classroom theory by applying what is learned on campus to a work situation.
2. Early exposure to a variety of professions.
3. Valuable work experience that can lead to a permanent career position upon graduation.
4. Exposure to state-of-the-art technologies and research methods not available on campus.

**Academic Credit for Work Experience**

The College of Liberal Arts and Sciences participates in this program with internship courses offered in each department at both the undergraduate and graduate levels. Students placed by the Center in paid or non-paid positions, as well as students who have obtained their own jobs, may be eligible to earn academic credit through internship or cooperative education courses at the 3939 or 5939 level.

Undergraduates must have attained junior standing in a CLAS degree program and have at least a 2.75 grade-point average. At the undergraduate level, projects will be granted from 1 to 3 hours of credit per semester with up to 9 hours that a student can apply toward the bachelor's degree.

Graduate students must have completed a minimum of 6 semester hours of lecture or seminar courses in a CLAS graduate degree program and have at least a 3.0 grade-point average. Graduate level projects will be awarded 1 to 6 credit hours for one or more projects up to a maximum of 6 credit hours.

No credit is awarded for prior work or life experiences.

Qualified students interested in applying to earn 3939 or 5939 internships /cooperative education credit must complete a Contract for Credit. The contract and further details can be obtained from the Center for Internships and Cooperative Education.

**Preparation for Professions**

Completion of the undergraduate curriculum of the College of Liberal Arts and Sciences can prepare students for a number of careers in the professions. Information on preparation for those professions most frequently asked about by students in the College is presented here. Students seeking information about other professions should contact the College Advising Office, 556-2555.

**LAW**

Students intending to enter a school of law may major in any field while completing their bachelor's degree programs since law schools do not generally specify a particular undergraduate degree major. Successful pre-law students from the College have had majors in many different fields. However, students preparing for law school should place primary emphasis on learning superior methods of study, critical thinking, and communication skills, which are often considered more important by law schools than factual knowledge alone.

The Law School Admission Test (LSAT) is required of all applicants for admission to law school and should be taken as early as possible during the senior year. For additional information, students should review the current *Prelaw Handbook*, published by the Law School Admissions Council and the Association of American Law Schools.

Students interested in applying for admission to the School of Law of the University of Colorado should contact the Admissions Office of the School of Law, Room 118, Fleming Law Building, Boulder, CO 80309.

Pre-law students are urged to participate in the regularly scheduled College prelaw activities, such as the prelaw orientations, LSAT preparation seminars, and meetings with law school recruiters. Prelaw students should contact the College prelaw advisor for information on these activities as well as for general prelaw advising, telephone 556-2555.

**JOURNALISM**

Students interested in preparing for a career in journalism may decide to obtain a bachelor's degree from the College as a general preparation, or they may choose to complete a B.S. degree in journalism. The B.S. degree in journalism is granted from the School of Journalism at the University of Colorado at Boulder. However, the first two years of the journalism curriculum may be completed at CU-Denver within the College. Students pursuing the journalism B.S. degree normally transfer into the School of Journalism at the beginning of the junior year. To be considered for a transfer admission, a student must have completed a minimum of 60 semester hours with a grade-point average of at least 2.25. Interested students should consult the *University of Colorado at Boulder Catalog* for detailed information concerning requirements for the B.S. degree in journalism. For further information and advising, call the Department of Journalism on the Boulder campus, 492-5007.

**HEALTH CAREERS**

The College has established a Health Careers Advisor to assist students in dentistry, medicine, osteopathy, and veterinary medicine. Students should contact the Health Careers Advisor at 556-2689 for current requirements and advising.

**ALLIED HEALTH CAREERS**

Course programs have been developed within the College to prepare students for the following specific careers within the general area of health sciences:
- Child health associate
- Dental hygiene
- Medical technology
- Nursing
- Optometry
- Pharmacy
- Physical therapy
- Podiatry

Because the prerequisites for these health career programs are continually changing, students interested in pursuing one of these careers should contact the Allied Health Careers Advisor at 556-2555 for current requirements and for advising.

**EDUCATION**

Students seeking certification for teaching at the elementary and/or secondary school level must complete a major program in the College of Liberal Arts and Sciences, and approximately 35 to 45 semester hours of professional education work in the School of Education. Up to 15 graduate credits from the Teacher Certification Program of the School of Education may be applied toward the B.A. degree in the College.

Students completing all requirements will receive a Bachelor of Arts degree before completing certification requirements.

Early planning is crucial for students intending to enter the Teacher Education Program. Since the School of Education has initiated a new program at both the elementary and secondary levels, students should consult the School during their first semester on campus concerning the requirements for the Teacher Education Program, 556-8451.

Students pursuing teacher certification should so indicate on all application and registration materials so that they may be advised by the School of Education faculty members. Application for admission to the Teacher Certification Program should be made during the last semester of the junior year. The minimum requirements for acceptance are:

1. Completion of at least 90 semester hours of acceptable college work with a grade-point average of 2.5 for all courses attempted, and 2.5 for all courses attempted at the University of Colorado, and 2.5 in the major teaching field. No student
will be recommended for certification to teach in any field in which the grade-point average is less than 2.5.

2. Information on the general education requirements for students planning to teach at the secondary or elementary school level are available in the School of Education.

College-wide Interdisciplinary Academic Programs

Most of the individual departments represented in the College have numerous links with other disciplines, and many faculty members consequently encourage students to take courses in related disciplines. In the natural and physical sciences new subject-matter areas are emerging from blends of traditional disciplines; examples include biochemistry, geophysics, biophysics, and psychobiology. In the social sciences the similarity of method and of subject matter from discipline to discipline tends to promote broad interaction and a sense of common purpose. In the arts and humanities the continual synthesis of useful analytical ideas and concepts gains strength as it is tested against differing perspectives; comparative literature, mixed media fine arts, and philosophical psychology are examples of this kind of interdisciplinary involvement. Therefore, students will often find opportunities to explore relationships among different disciplines while studying within traditional disciplines. In some instances, such as ethnic studies, much or most of the academic work can be characterized as interdisciplinary even though the area is treated as a traditional discipline.

For information on the Master of Basic Science and Master of Science in Environmental Science degrees see the appropriate heading in this section of the catalog.

INDIVIDUALLY STRUCTURED MAJOR

Some students wish to study in depth, as a major program, a coherent topic area that crosses traditional disciplinary lines and/or requires significant independent study to complete. These students are encouraged to propose a design for an individually structured major program. To pursue an individually structured major program, a student must work out the details of the proposed program some time after the first year in the College with a committee of College faculty members. The major becomes the student's official program upon final approval by the faculty committee and the associate dean of the College. In recent years students in the College have structured majors in such areas as French and cinematography, or oral history and environmental planning. Advising for the individually structured major is available through the College Advising Office, 556-2555.

ETHNIC STUDIES

This interdisciplinary program, housed in the social sciences, provides a minor. For a complete description see Ethnic Studies in this section of the catalog.

INTERDISCIPLINARY PROGRAMS IN THE HUMANITIES

Undergraduate. Honors in Humanities is a cocurricular program designed for students whose academic major lies outside of the humanities, although anyone interested in a structured curriculum in humanistic studies is invited to participate. In particular, students in business, engineering, and the sciences will find this program valuable in deepening their undergraduate education. For details on this program, see Honors in Humanities, in this section of the catalog.

Graduate. A complete interdisciplinary program leading to the Master of Humanities is available at CU-Denver. This curriculum combines the arts, communication, literature, philosophy, and theatre, and is especially attractive to public school teachers who teach in several areas and also to working professionals seeking intellectual enrichment or making midcareer changes. For details on this program, see Master of Humanities, in this section of the catalog.


The College of Liberal Arts and Sciences, in cooperation with the College of Business and Administration and the Graduate School of Public Affairs, offers students the opportunity to complete a bachelor’s degree and master’s degree in five years rather than the usual six years. The programs combine undergraduate general education and major studies with a specialized curriculum in business or public affairs, and strive to develop intellectual and professional skills in a coordinated manner.

Students in the B.A./M.B.A. or B.A./M.P.A. programs must fulfill all of the graduation requirements from the College of Liberal Arts and Sciences (CLAS); maintain a 3.5 undergraduate grade-point average in CLAS and complete 75 percent of their undergraduate program to be eligible for admission; and enroll formally in the programs through the CLAS Advising Office. Students admitted into either of the programs begin taking 6000-level courses in business or public administration during their senior year. These courses will count toward the bachelor’s degree as electives. For further information, contact the CLAS Advising Office, 556-2555.

INTERNATIONAL AFFAIRS, INDIVIDUALLY STRUCTURED, MINOR, AND CERTIFICATE

Co-Directors:
Mark Lehrer
CN-201
556-4893

Stephen Thomas
NC-3101C
556-3556

James Wolf
NC-3004C
556-4830

International affairs is an interdisciplinary program that offers opportunities to pursue an individually structured major, minor, or certificate. It combines the expertise of faculty in the College of Liberal Arts and Sciences as well as the College of Business and the Schools of Education and Public Affairs.

The destiny of the United States is increasingly influenced by events on the global scale. In the future, we will live and work in a world in which interdependence will require an expanded sense of the world beyond our boundaries. An increased knowledge of the world and a sensitivity to differing cultures and perspectives is necessary in much of our decision making in business, public service, and our private lives.

The International Affairs Program is open to all undergraduate CU-Denver students. The minor can be combined with any undergraduate major in the College of Liberal Arts and Sciences. A Certificate in International Affairs is available to students enrolled in any CU-Denver B.S. program or those who wish to focus on international affairs without taking a foreign language.

Students electing to pursue an individually structured major, minor, or to earn a certificate in international affairs are given the maximum opportunity to design their own personalized course of study in cooperation with an international affairs faculty advisor.
For further information contact Joan Van Becelaere or Jerald Wagenman in the Office of International Affairs, NC 4019, 556-3489.

Requirements for the individually structured major:
1. Personalized program plan constructed with the help of faculty advisors.
2. From 48 to 54 hours in international affairs related courses in three academic disciplines with a minimum of 15 hours in each discipline. At least half of the courses must be in the College of Liberal Arts and Sciences.
3. A capstone course to be completed during the senior year either as an independent study with an advisor or as a seminar, depending on schedule.
4. A minimum of a fourth semester in a modern foreign language if a language is not chosen as one of the three disciplines for specific concentration.
5. All College of Liberal Arts and Sciences general requirements for graduation.

Requirements for a Minor
1. Undergraduate student at CU-Denver.
2. Fourth semester of a foreign language.
3. 16 hours distributed over at least 3 disciplines.
4. Develop a personalized study focus with the help of an advisor.

Requirements for a Certificate
1. Student at CU-Denver.
2. 19 hours distributed over at least 3 disciplines.
3. Develop a personalized study focus with the help of an advisor.

NEUROSCIENCE PROGRAM

Neuroscience is one of the fastest growing fields among the health sciences - encompassing neuroanatomy, neurochemistry, neuropathology, and behavior. This multidisciplinary program including biology, chemistry, and psychology, is intended to prepare students for graduate study in the neurosciences. The neurosciences program consists of a core of required courses, three elective courses, and an additional body of course work that will vary according to the students area of emphasis within this broad discipline. Prospective neuroscience students should identify an area of emphasis and plan their curriculum through consultation with advisors in the disciplines represented.

The following faculty in the College of Liberal Arts and Sciences serve as advisors in the Neuroscience Program:

Biology Advisors: Gerald Audesirk, Theresa Audesirk, or Linda Dixon, 556-2689
Chemistry Advisor: John Lanning, 556-2557
Psychology Advisor: Gary Stern, 556-8565

WOMENS STUDIES

Contact: Jana Everett, Political Science, 556-2436

Womens Studies is an interdisciplinary program that focuses on gender issues in the humanities, natural sciences, and social sciences. At the undergraduate level, a Womens Studies minor is available in the College of Liberal Arts and Sciences, and at the graduate level a Womens Studies Certificate is available in the Master of Social Science program. The following requirements (totaling 19-21 credits) must be completed in order to minor in the Womens Studies program at CU-Denver:

1. Introduction to Womens Studies (ENGL. 2400 / 3400-3, HIST. 2540 / 3540-3). This introductory course traces the evolution of contemporary western gender identities through literary and historical sources.
2. Fifteen credits of Womens Studies related courses at the 3000 level or above. At least one course must be taken in each of the three areas of arts and humanities, natural and physical sciences, and social sciences. Up to 6 hours can be taken in Womens Studies related cooperative education and/or independent studies. (For example, such internships in political science include working with the Domestic Violence Unit of the City Attorneys Office.)
3. Senior Project in Womens Studies (1-3 credits). Research or creative work project done under the supervision of a faculty member on an independent study basis. The project should attempt to integrate the perspectives and/or approaches of more than one discipline on gender images, roles, or identities. Students will present their projects at Womens Studies Brown Bag gatherings of interested faculty, students, staff, and community members.

Transfer Policy

At least 10 credits of work (including the senior project) must be completed at CU-Denver in order to receive a minor in Womens Studies.

WRITING CENTER

The CU-Denver Writing Center provides editorial assistance to all members of the University community and serves as a contact point for university writing clubs. Graduate and undergraduate students are especially welcome to come to the Center where staff composed of Department of English Writing Program faculty offer information and guidance to people working with every sort of academic document. These include essays, research papers, critical and analytical papers, and business and technical reports. Special support is available for graduate students writing their theses and dissertations. The staff also will assist in the writing and formatting of resumes and other application materials. For additional information contact the Writing Center, NC 1804, 556-4845.

SCHOOL OF THE ARTS

Director: David J. Magidson
Office: AR 288
Telephone: 556-2727

The School of the Arts at CU-Denver has as its mission the preparation of creative practitioners, managers, and consumers of the arts. Opportunities are provided for an integrated arts education leading to careers in the arts, application of the arts to other professions, and personal enrichment.

The curricular and extra-curricular programs offered are based upon arts theory and practice with emphasis on historical, social, creative, and commercial considerations. Particular importance is placed on the integration of academic programs with local, state, regional, and national arts communities so the School also is a resource that provides information, expertise, and guidance. In this area the resources of the city, state, and region are available to students interested in internships and other practical experiences.

It is the ultimate goal to provide the environment in which artists at all stages of development can pursue the creative process and, in so doing, gain a traditional grounding in fundamental methods with expanded opportunities for individual expression.

Students wishing to major or minor in any of the disciplines in the School of the Arts (fine arts, music, or theatre), should consult with the appropriate department chair or the director of the School.
FINE ARTS

Chairs: Gerald C. Johnson
Office: AR 185
Telephone: 556-4891
Faculty: Professors: Charles L. Moone,
Ernest O. Porps
Associate Professors: John R. Fudge,
Gerald C. Johnson
Assistant Professor: Celia Rabinovitch
Adjunct: Richard G. Conn
Attendant: Jane Comstock

Undergraduate

The pursuit of education in the visual arts develops a comprehensive knowledge of various media: painting, photography, drawing, sculpture, etc., including an understanding of art theory that encourages informed and powerful decisions in the practice of one's craft.

Similarly, the pursuit of art history involves knowledge of the methods and materials of art, as well as of the other historical disciplines and methodologies (the history of ideas, culture, philosophy, or religion) that provide insight about the history of art and the imagemaking process. While the emphasis in the studio area is visual arts practice, the history of art emphasis is on critical writing and analysis.

A variety of opportunities is open to the fine arts major. The degree can be specific preparation for graduate study or a more general background for fields related to the visual arts in several areas including the art gallery field, arts administration, museum work, and art conservation.

Note: All new students and transfer students should contact the art department chair as early in their academic careers as possible for information and for assignment to an advisor.

Graduating students receiving the B.F.A. degree are required to have a senior show during their last semester of study. This procedure will be coordinated by the student's advisor.

BACHELOR OF FINE ARTS — PHOTOGRAPHY

Minimum credit hours: 54
Upper division credit hours required: 24
Residency requirement: 27 credit hours must be taken at CU-Denver

Required Courses

F A. 1000. Basic Drawing
F A. 1200. Basic Painting
F A. 1500. Basic Sculpture
F A. 2400. Visual Studies
F A. 2600. History of Art Survey I
F A. 2610. History of Art Survey II
F A. 4800. Art Seminar

Plus 6 upper division hours in art history; 12 upper division hours in one area of studio art (such as painting or sculpture); plus 9 upper division hours in drawing (one line drawing class is strongly suggested); plus 6 to 24 credit hours of electives in art.

Up to 9 hours of credit in art courses not offered by CU-Denver (such as ceramics, woodworking, jewelry design) may be transferred from other accredited institutions toward the major.

All classes must be completed with a grade of C or better.

BACHELOR OF FINE ARTS — CREATIVE ARTS

Minimum credit hours: 54
Maximum credit hours: 72
Upper division credit hours required: 30
Residency requirement: 27 credit hours must be taken at CU-Denver

Required Courses

F A. 2400. Visual Studies
F A. 2600. History of Art Survey I
F A. 2610. History of Art Survey II
F A. 4800. Art Seminar

Plus 6 upper division hours in art history; 12 upper division hours in one area of studio art (such as painting or sculpture); plus 9 upper division hours in drawing (one line drawing class is strongly suggested); plus 6 to 24 credit hours of electives in art.

Up to 9 hours of credit in art courses not offered by CU-Denver (such as ceramics, woodworking, jewelry design) may be transferred from other accredited institutions toward the major.

All classes must be completed with a grade of C or better.

BACHELOR OF ARTS—FINE ARTS (ART HISTORY)

Minimum credit hours: 42
Maximum credit hours: 48
Upper division credit hours required: 24
Residency requirement: 21 credit hours must be taken at CU-Denver

Required Courses

F A. 1000. Basic Drawing
F A. 1200. Basic Painting
F A. 1500. Basic Sculpture
F A. 2400. Visual Studies
F A. 2600. History of Art Survey I
F A. 2610. History of Art Survey II
F A. 4800. Art Seminar

Plus 6 upper division hours in art history; 15 to 21 credit hours of electives in art (15 must be upper division); total credit hours: 42 to 48.

Up to 9 hours of credit in art courses not offered by CU-Denver (such as ceramics, woodworking, jewelry design) may be transferred from other accredited institutions toward the major.

All classes must be completed with a grade of C or better.

REQUIREMENTS FOR THE MINOR IN FINE ARTS

1. Studio Art

Minimum of two of these classes - 6 credits

F A. 1000. Basic Drawing
F A. 1200. Basic Painting
F A. 1500. Basic Sculpture
F A. 2400. Visual Studies
Minimum of one upper division class - 3 credits
One art history class - 3 credits
Two other studio art classes, upper or lower division - 6 credits
Total credits - 18

OR

2. Art History
F A. 2600. History of Art Survey I - 3 credits
F A. 2610. History of Art Survey II - 3 credits
One studio art class - 3 credits
Three other art history classes, at least one of which is upper division - 9 credits
Total credits - 18

Note: At least 12 of these credit hours must be completed at CU-Denver. No grade below C will be counted toward the minor requirements.

Graduate

The graduate courses in fine arts also are applicable to the Master of Humanities program at CU-Denver.

COURSES

Note: Attendance is required at all sessions.

Drawing
F A. 1000-3. Basic Drawing. An introduction to drawing designed for those who have never drawn before. Materials such as pencils, pen and ink, and crayons will be used in class. Subjects will include photography, real objects, and the human figure.
F A. 2000-3. Drawing II. Centered around class projects. The emphasis will be on a deeper understanding of essential concepts introduced in Basic Drawing and the development of skills using a variety of techniques and materials. The media of color will be introduced. Prer., F A. 1000.

Printmaking
F A. 3400/3410-3. First-Year Printmaking. Introduction to intaglio and relief printing, including metal engraving and etching, and woodcut.
F A. 3420/3430-3. Silk Screen (Serigraphy). Silk screen techniques as they relate to fine art prints.

Painting
F A. 1200-3. Basic Painting. Structured introduction to painting for people who have never painted before. Work will be done in acrylic (water base) paint in both black and white and color. Basic Drawing is advised as a prerequisite.
F A. 2200-3. Painting II. A follow-up course to Basic Painting with an emphasis on the development of painting skills. In completing specific assignments, students will be encouraged to explore a variety of painting techniques. Both acrylic and oil painting techniques will be taught. Prer., F.A. 1200.
F A. 3220/4220/5220-3. Watercolor. Explores various approaches to transparent watercolor, working from a variety of different subject matter. Second level will work independently and include mixed media. Prer., F A. 1200.

Sculpture
F A. 1500-3. Basic Sculpture. This course stresses creativity, design, and visualization in the three-dimensional area. A number of class projects will deal with shape, line, volume, and color. Slide presentations and shop demonstrations will be coordinated with projects, as well as class discussions of student work.
F A. 2500-3. Sculpture III. This course follows up the Basic Sculpture with an emphasis on the development of technical skills. The course will focus on mold making procedures and metal fabricating, and will explore the relationship of these to other areas of sculpture. Prer., F A. 1500.

Photography
F A. 3150-3. Photography I. First semester of comprehensive foundation course in black and white photography. Introduction to aesthetics, concepts, and history of photography as well as basic camera and darkroom technique. Emphasis on photography as a means to a formal and expressive end.
F A. 3170-3. Color Photography I. Introduction to color theory, materials, and technique. Using language and skills acquired in Photo I, students will explore the symbolic and psychological possibilities of color in image making. Prer., F A. 3150 or consent of photography instructor.
F A. 3180-3. Photo Criticism. Introduction to the historical texts of photo criticism. Course will examine texts relating to practice of photography as fine art from early 19th century to present. Critical writing about photography will be discussed and practiced. Prer., F A. 3630.
F A. 3190-3. Photography II. Second semester of comprehensive foundation course in black and white photography. Further development of concepts, vocabulary, and aesthetics, as well as camera and darkroom skills. Prer., F A. 3150.
F A. 3630-3. History of Photography. A comprehensive history of photography, from 1839 to the present. Slides of historic photographs and a number of original photographs will illustrate the various stages, techniques, and types of photography and their relationships to the totality of art.
F A. 4190-3. Photography IV. Advanced project-oriented course. Emphasis on integrating visual and conceptual ideas in a cohesive body of work. A research paper is required to support project. Final critique with no fewer than two other fine arts faculty. Exhibition of work in a public place. Donation of project slides to the CU-Denver
archives. Prer., F A. 4150.

Topics in Photography. Designed to accommodate a variety of subjects in the area of photography which are not normally covered in photography courses. Check current Schedule of Classes for specific topic descriptions, course numbers, and credit hours.

General Arts

F A. 2300-3. Artistic Journal/Sketchbook. The practice of recording visual and verbal ideas is the traditional ground for the more formal creation associated with artistic expression. This process will be taught and practiced in the development of the student's own journal. Prer., sophomore standing.


F A. 3300-3. Creativity and Problem Solving. Exploration of the process of problem solving through the means fundamental to all artistic endeavors, i.e., making and doing.

Topics in Studio Art. Designed to accommodate a variety of subjects in the area of studio art which are not normally covered in studio art courses. Check current Schedule of Classes for specific topic descriptions, course numbers, and credit hours.

Art History

F A. 1600-3. Introduction to Art. This course is an introduction to art both in our everyday lives and in the more formal appreciation of the art world in general.

F A. 2600-3. History of Art I (Survey). History of art of all ages, reflecting the varied cultures of mankind from cave paintings to the Renaissance.

F A. 2610-3. History of Art II (Survey). History of art of all ages, reflecting the various cultures of mankind from the Renaissance to the present.

F A. 3630-3. History of Photography. A comprehensive history of photography, 1839 to the present. Slides of historic photographs and a number of original photographs will illustrate the various stages, techniques, and types of photography and their relationships to the totality of art.

F A. 4610/5610-3: Pre-Columbian Art. Architecture, sculpture, and painting of the high cultures of Meso-America and the Andean area before the Spanish conquest. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4620/5620-3: American Art. Study of American art and architecture from the Colonial period to the present. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4650/5650-3: Nineteenth-Century Art. History of European and American movements of the late 19th century from the French Revolution through Post-Impressionism, with attention to Neoclassicism, Romanticism, Realism, and Impressionism. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4664/5664-3: Twentieth-Century Art. A survey of major trends in painting, sculpture, and architecture from Post-Impressionism, to the present. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4670/5670-3: Greek and Roman Art. Greek art and architecture from archaic through Hellenistic periods. Etruscan art, and Roman art and architecture from the Republican period to the fall of the empire. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4680/5680-3: Art of the Middle Ages. A survey of sculpture, painting, and architecture from the A.D. 300 to 1500, which includes the art of the Early Christian, Byzantine, Early Medieval, Romanesque, and Gothic periods. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4690/5690-3: Renaissance Art. The art and architecture of Italy and Northern Europe (Flanders, France, and Germany) from the late 14th century to the late 16th century. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4710/5710-3: Baroque and Rococo Art. The history of art in Italy, Spain, France, England, and the low countries in the 17th and 18th centuries. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4720/5720-3: North American Indian Art. Survey of major tribal styles of the North American continent. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4730/5730-3: Arts of Japan. Appreciation and chronological development of the arts of Japan. Emphasis upon the arts of Shinto and Buddhism as well as the particular Japanese aesthetic. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4750/5750-3: Arts of China. A survey of Chinese painting, sculpture, and architecture from the neolithic period through the present era, including the art of Tibet. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4760/5760-3: Art of the Ancient Middle East. A survey of the architecture, sculpture, and painting of the ancient Middle East from their beginnings to the end of the Persian Empire, including the arts of Anatolia, Egypt, Mesopotamia, and Persia. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4770/5770-3: Art of India and Southeast Asia. A survey of the architecture, sculpture, and painting of India and those areas of Southeast Asia influenced by India from the period of Mohenjo Dato and Harappa to the present. The Himalayan region will be treated as will Tantric art in general. Prer., F A. 2600 or 2610 or consent of instructor.

F A. 4790/5790-3: Methods in Art History. A seminar in the nature and purpose of the study of the history of art in which the student is introduced to basic approaches, various research methodologies, and professional career possibilities in the history of art. Prer., F A. 2600 or 2610 or consent of instructor.

Topics in Art History. Designed to accommodate a variety of subjects in the area of art history which are not normally covered in art history courses. Check current Schedule of Classes for specific topic descriptions, course numbers, and credit hours.

Independent Study, Cooperative Education, and Seminar

F A. 2840/4840/5840-1-3. Independent Study (Undergraduate). Individual projects or studies assigned by the major professor.

F A. 3939-1-3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

F A. 4800/5800-3: Art Seminar. For fine arts majors, undergraduate and graduate. Course based on an exchange of ideas basic to the student's own creative work, and to contemporary philosophies and tendencies in the field. Prer. 12 hours of basic art courses or equivalent, F A. 2600-2610 or consent of instructor. Seniors have priority.

F A. 4810-3. Advanced Studio.

MUSIC

Chair: Walter L. Barr
Office: AR 288
Telephone: 556-2727

Faculty: Professors: Roy A. Pratts, Franz L. Roehmann
Associate Professors: Walter L. Barr, Zoe B. Erisman
Assistant Professors: George Arasimowicz, Frank J. Jermance, Billy R. Porter
Senior Instructors: Donna J. Bogard, William Clark
Adjunct: Martin Polon

The music program at the University of Colorado at Denver enrolls students preparing for professional careers in the music industry. The first two years of study offer courses in the arts and sciences and include a firm background in the various areas of music. Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.
in music theory, literature, and performance. At the completion of the sophomore year, students select one of the four areas of study: scoring and arranging, sound synthesis and recording technology, music management, or performance. The four-year music program culminates in a Bachelor of Science in Music degree and is accredited by the National Association of Schools of Music.

Music facilities include a Self-Paced Learning Center, Computer Music Laboratory, Electronic Keyboard and Synthesizer Laboratory, and a complex of recording studios for 4, 8, and 16-track recording.

The specialized curriculum offered by the department leads graduates to both local and national positions in audio research, in major production companies, symphony arts administration, and audio engineering. Additionally, many are established as owners of booking agencies, publishing companies, recording studios, and as professional musicians.

Faculty

CU-Denver's music faculty are all active professionals most of whom enjoy national reputations in their individual areas of specialization. Through faculty interest, the department is represented in a wide variety of professional societies including AES, SPARS, NAJE, ASCAP, BMI, NASM, and AMPAS.

Areas of Specialization

Scoring and Arranging. This emphasis consists of courses in symphonic and jazz orchestration, analysis, counterpoint, and composition. The curriculum presents comprehensive traditional knowledge together with practical application for the aspiring composer/arranger.

Sound Synthesis and Recording Technology. This area of study addresses the staff of contemporary technology of studio recording, sound reinforcement, and electronic music. It is intended to develop skills for creative musicians, producers, and technicians, using both analog and digital technology.

Music Management. Musicians who need a career that goes beyond traditional composing and performing often select music management for their degree emphasis. This program prepares graduates for careers in such fields as artist management, music publishing, music merchandising, concert promotion, record production, and the development of skills relative to the rapidly expanding telecommunications industry.

Performance. Students gain performance skills in classical, jazz, commercial, and experimental music styles. The program includes specialized courses in large and small performance ensembles, applied study, contemporary improvisation, and analysis, culminating in the presentation of a senior recital.

Visiting Faculty and Artists

Special workshops, clinics, seminars, and symposia are offered periodically, e.g., National Association of Recording Arts and Science, National Music Publishers' Association, National Public Radio, and performers appearing in the Denver area.

Requirements for Admission

In addition to the entrance requirements of the University outlined in the General Information section of this catalog, the entering student must meet the following requirements of the Department of Music:

Required High School Units

<table>
<thead>
<tr>
<th>Subject</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>3</td>
</tr>
<tr>
<td>Foreign language</td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>8</td>
</tr>
<tr>
<td>Physical science</td>
<td></td>
</tr>
<tr>
<td>Social Science</td>
<td></td>
</tr>
<tr>
<td>Theoretical music</td>
<td></td>
</tr>
<tr>
<td>Additional high school units</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

The prospective music students should be familiar with the established solo and ensemble literature for their major instrument, and possess basic sight-reading and technical skills.

It is expected that all students will have had several years of previous experience as performers. Two years of piano study are recommended.

The Department of Music requires an audition of all entering freshman and undergraduate transfer students. In lieu of the personal audition, applicants may substitute tape recordings (about ten minutes in length) and a statement of music reading competence from a qualified teacher. Interested students should write to the Department of Music, CU-Denver, for audition applications.

Academic Policies

Residency Requirements

The Department of Music requires that 56 of the hours required for graduation must be completed in residence. This total may be reduced by the faculty because of excellent work done at CU-Denver and because of high scholarship exhibited at previous institutions attended. In no case shall the minimum be fewer than 40 hours distributed over three semesters.

Ensembles

All music majors enrolled for 6 credits or more each semester are required to enroll in a ensemble. Non-music majors are invited to audition for any of the CU-Denver music ensembles. Each carries 1 semester hour of credit. Some of these groups have more than one section, depending upon skill level: Electronic Music Ensemble, Jazz Combo, New Music Ensemble. The New Singers, Fusion Ensemble, Dixie Ensemble, Chamber Music (various), Percussion Ensemble, Brass Ensemble, Woodwind Ensemble, and Vocal Jazz Combo.

Facilities Fee

All music majors are required to pay a $24 facilities fee at the time of registration. Non-music majors will be assessed a similar fee when registering for selected technical courses (see course descriptions).

Applied Music Policy

All performance standards, requirements, and credits specified for a particular music degree in the department do not necessarily transfer and become acceptable for any other music degree within the department. Additional information on this policy is available from the Chair of the Department of Music. All applied music courses are restricted to music majors only.

Undergraduate

The Bachelor of Science in Music degree is intended for students seeking preparation for professional careers in music related to the recording, broadcasting, business, and entertainment industries.

Core Curriculum

Work is to be started in the student's freshman year. A large portion of it can be completed by the end of the sophomore year.

Required Courses in Music Semester Hours

MUS 1000-1020. Theory and Musicianship I 4
MUS. 1010-1030. Theory and Musicianship I and II 4
MUS. 2000-2020. Theory and Musicianship II 4
MUS. 2540. Music Technology I 3
MUS. 3540. Studio Cal./Maint. 3
MUS. 1010 and 1030. Theory I 4
MUS. 1020. Theory II 4
MUS. 1000. History and Literature of Music I 4
MUS. 1800. History and Literature of Music II 4
MUS. 2010. Contemporary Styles 3
MUS. 1800, 1810. History and Literature of Music I and II 4
MUS. 1030. Counterpoint 2
MUS. 1020. Theory II 4
MUS. 1010. Theory I 4
PMUS. 1033. Piano class for piano majors, in addition to applied music courses.

Areas of Study

When students are approaching completion of courses in the core curriculum, they are to select an area of study in consultation with an advisor. An area of study is to be selected from the following:

*Emphasis in Scoring and Arranging Semester Hours*
MUS. 2070. Instrumentation 2
MUS. 3030. Scoring and Arranging I 2
MUS. 3050. Elementary Composition 2
MUS. 4010. Counterpoint 2
MUS. 4030. Scoring and Arranging II 3
MUS. 4060. Analysis I 2
MUS. 4200. Composition 3
Applied music (2 semesters) 4
Composition recital 0
Music electives 4 4
Total 24

*Emphasis in Performance Semester Hours*
Applied music (four semesters) 12
Junior and senior recitals 0
MUS. 4060. Analysis 2
MUS. 3283. Contemporary Improvisation 2
MUS. 4800. Research Project 2
Music electives 4 4
Total 22

Performance Requirements

Students are required to include applied music study on their principal performing medium (instrument or voice) from the outset of their studies at CU-Denver. Students are required to pass a performance proficiency examination at the end of their fourth semester of study.

All majors taking applied music must perform solo at least once a semester on a General Recital. General Recitals are scheduled throughout the semester.

**ENSEMBLE REQUIREMENT**

A total of 8 semester hours in ensemble participation is required. Music majors enrolled in 6 credit hours or more are required to register for an ensemble. Students should acquire experience in both large and small ensembles, vocal and instrumental, in accordance with their capabilities and interests.

**MODEL SCHEDULE**

A recommended schedule for all freshman music students is the same.

**FRESHMAN YEAR**

**Fall Semester**
MUS. 1000 and 1020. Theory I 4
MUS. 1800. History and Literature of Music I 2

**Spring Semester**
MUS. 1010 and 1030. Theory I 4
MUS. 1810. History and Literature of Music I 4
MUS. 2710. Music Business 3
PMUS. 4720. Music Management 3
MUS. 4730. Music Production 3
ACCT. 2000. Introduction to Financial Accounting 3
MKTG. 3300. Principles of Marketing 3
FNCE. 3300. Basic Finance 3
Music Business electives 6
Senior project 4 4
Total 25

**Spring Semester**
MUS. 1010 and 1030. Theory II 4
MUS. 1810. History and Literature of Music II 4
MUS. 2710. Music Business 3
PMUS. 4720. Music Management 3
MUS. 4730. Music Production 3
ACCT. 2000. Introduction to Financial Accounting 3
MKTG. 3300. Principles of Marketing 3
FNCE. 3300. Basic Finance 3
Music Business electives 6
Senior project 4 4
Total 22

The schedules of sophomore, junior, and senior music students vary according to their areas of concentration.

**GRADUATE**

All graduate degrees in music are directed from the Boulder campus by the Associate Dean for Graduate Studies. For complete information on the programs available, consult the CU-Boulder Graduate School Bulletin.

Upon consultation with a graduate advisor in Boulder, a portion of work may be accomplished on the Denver campus toward a graduate degree. Courses in music engineering, commercial scoring and arranging, and music business are offered only on the Denver campus and are typically viewed as appropriate for transfer credit to traditional degrees such as composition and education. Interested students should contact Dean, College of Music, University of Colorado at Boulder, Campus Box 301, Boulder, CO.

**COURSES**

**Music Academic Classes**

MUS. 1000-3. Theory and Musicianship I. Fall. A study of harmonic procedures as derived from the common practice period, and their relationship to contemporary concepts. Prereq., placement tests; coreq., MUS. 1020 and PMUS. 1023.


MUS. 1020-1. Ear Training and Sight Singing I. Fall. Coreq., MUS. 1000.

MUS. 1030-1. Ear Training and Sight Singing II. Spring. Prereq., MUS. 1000 and 1020; coreq., MUS. 1010.

MUS. 1060-2. Music Fundamentals. Fall. An introduction to the rudiments of music notation, basic ear training, and reading of


MUS. 2700-3, 2710-3. The Music Business I and II. An introduction to music as a business and profession, emphasizing music publishing, recording, broadcasting, copyright, music management, and career options.


MUS. 2810-3. History of Rock and Roll. Fall. A musical journey back through the past. This course is a listening experience of the styles highlighting artists who pioneered rock and roll. The instructor played a major role in this creation and is considered the audiophile engineer of this era.

MUS. 3030-2. Scoring and Arranging I. Fall. Concept, layout, and arrangements for small (2, 3, 4 voice) ensemble. Pr Req. or coreq., MUS. 2010.

MUS. 3050-2. Elementary Composition. Fall. Pr Req. or coreq., MUS. 4010.

MUS. 3283-2. Contemporary Improvisation. Fall. An introduction through performance to the art of improvisation as practiced in contemporary Western culture. Pr Req., MUS. 2000 and 2020, or consent of instructor.


MUS. 3710-1. Music and the Media. A five-week (module) course consisting of the following topical modules: The Business of Music, A study of business aspects associated with a career in music.

The Musician and the Law. An overview of the laws which affect musicians, including copyright and contracts taught from a musicians perspective.

Music in Advertising and Film. An overview of the writing, production, and marketing of commercial music.

Recording Studio Management. A nuts and bolts perspective on all aspects of managing a successful recording/audio production facility.

Independent Record Production. All you need to know about putting out your own record, cassette, or compact disc and making the connections with major record companies.

MUS. 3720-3. Law and the Music Industry. Fall. An overview of the body of law which governs the music industry. Emphasis on the musicians' ability to recognize a potential legal dispute, and to understand his/her rights.


MUS. 3800-3, 3810-3. History and Literature of Music III and IV. Survey of Western art music with stylistic analyses of representative works from all major periods. Pr Req., MUS. 1810.


MUS. 4330-2. Dixie Jazz in Your School. How to start a dixieland band in your secondary or middle school. Course will cover materials, rehearsal techniques, improvisation, and arranging techniques. Culmination of the course will be a one-day field trip to Central City Jazz Festival (extra cost approximately $15).

MUS. 4700-1-4. Research Project: Music Management. Senior project/independent study by arrangement with instructor. 103 credit hours can be satisfied by an internship (Cooperative Education placement).

MUS. 4710-2. Research Project: Performance. A scholarly inquiry and report on an aspect of a performance major senior recital. Typically includes an historical study of a selected composer, the music, the instrument, or a style. Assigned in consultation with primary instructor. Pr Req., consent of instructor.

MUS. 4740-3. Music Business Analysis. An analysis of specific managerial situations unique to the music and entertainment industries. Aspects of finance, marketing, taxation, and management science are explored.

Upper Division/Graduate Level

MUS. 4460/5460-3. Survey of Recording Techniques. An overview of the operating
principles and personality characteristics of microphones, consoles, sound systems, equalizers, and multi-track tape recorders. An excellent course for the educator.


MUS. 4490/5490-3. Music Programs for Personal Computers. The presentation of basic computer operation and vocabulary including MIDI, contemporary systems, sequencing, sampling and computer applications to music. Music degree students planning to take this course should receive consent of instructor for fulfillment of MUS. 2470.


MUS. 4600/5600-1-3. Topics in Music. Special events, festivals, workshops, and seminars of interest to educators and active professionals in music. Typical topics have included the Vail Jazz Festival, Telluride Jazz Festival, Stereo Television Conference, etc. Credit is variable depending on nature of event.

MUS. 4720/5720-3. Music Management. Fall. The theory and practice of contemporary business management as it relates to music marketing, artist management, the recording, broadcasting, and telecommunications industries. Prer., for 4720, MUS. 2710.


MUS. 4750/5750-3. Legal Environment in the Arts. Spring. Examination of legal issues confronting arts administrators. Emphasis on contractual considerations, application of copyright law, and establishing non-profit organizations. Prer., for 4750, MUS. 3700 or consent of instructor.


MUS. 4820-1/5820-1 to 3. Special Studies: Education. Prer., consent of instructor.

MUS. 4830-1/5830-1 to 3. Special Studies: Other. Prer., consent of instructor.

Music Performance Classes

PMUS. 1023-1. Piano Class. Offered from beginning through intermediate levels. Course content includes functional piano skills of sight-reading, transposing, improvising, and a brief introduction to performing in various styles. Includes some exposure to electronic keyboards and synthesizers. Facilities fee: $24. Prer., consent of instructor.

PMUS. 1033-1. Piano Class: Piano Majors. Prer., consent of instructor.


PMUS. 1095-1. Fingerboard Class. Group fingerboard instruction providing skill development in the standard guitar techniques. These studies include harmonic, melodic, and rhythmic common practice. This is a required course for all guitar performers seeking the bachelors degree.


PMUS. 1202/3202-1. Dixie Ensemble. Prer., audition with instructor.

PMUS. 1242/3242-1. Chamber Singers. Solo and ensemble performance in a variety of musical styles. Prer., audition.


PMUS. 1272/3272-1. Fusion Ensemble. Prer., audition with instructor.


PMUS. 1312/3312-1. New Music Ensemble. Prer., audition/meeting with instructor.

PMUS. 1322-1/3322-1. New Singers. Prer., audition with instructor.

PMUS. 1332/3332-1. Percussion Ensemble. Prer., consent of instructor.

PMUS. 1372/3372-1. Jazz Combo. Prer., audition with instructor.


PMUS. 1501-1741-2 and 3501-3741-3. Applied Instruction. Private instruction in electric and acoustic bass, bassoon, clarinet, bass clarinet, flute, French horn, guitar, oboe, percussion, piano, jazz piano, saxophone, synthesizer, trombone, trumpet, violin, viola, violoncello, and voice. Open only to accepted music majors enrolled for a minimum of 7 semester credit hours of nonapplied courses.

PMUS. 3050-2. Voice Performance Techniques. Teaches the student to become comfortable singing on stage in various vocal styles by acquainting the student with stage techniques such as stage deportment, interpretation, audition techniques, etc. Also helps the student to communicate with the audience — sell a song, etc. Class instructor assisted by several guest speakers and performers. Accompanist provided. Students are expected to perform several times for the class from memory, followed by critique/discussion. Performances are video-taped. Prer., students should be able to learn music quickly or at least have a large repertoire from which to choose. Each student should bring sheet music for at least five pieces to be worked on in class along with a blank videotape. ALL STUDENTS WILL PERFORM.

PMUS. 4600/5600-1-3. Topics in Music. See course description for MUS. 4600/5600.


PMUS. 4770/5770-1. Special Studies: Other. Directed independent study of a scholarly nature not covered by existing titles. Provided to achieve maximum flexibility in identifying focus and inquiry for senior/graduate research students. Prer., consent of instructor.

THEATRE

Associate Chair: Gerald C. Johnson
Office: AR 185
Telephone: 556-4891

Faculty: Associate Professors: J. Brad Bowles, Laura Cuetara
Assistant Professor: Kent Homchick
Senior Instructor: Joseph W. Zender
Adjunct: J. Joseph Craft

1Prer., for 4000 level, junior standing.
Theatre Emphasis

Undergraduate

Students wishing to study theatre may choose the theatre emphasis within the communication and theatre major in the College of Liberal Arts and Sciences.

The emphasis in theatre is designed to train the diversified theatre artist—writer, director, performer, designer, teacher—and to provide opportunities for a broad range of production process and performance experiences in courses, laboratory workshops, full productions, and field work in the Denver area. The goal of the theatre program is an understanding of the potential of the theatre as an expressive medium in the context of its culture and as a collaborative art form in relationship to literature, fine arts, and music.

The theatre emphasis has five areas of focus: acting/directing, design/technical, theory/history, special audiences/applied theatre, and theatre management. Each student is required to complete a comprehensive series of core courses in theatre and the allied fields, and then concentrate in one of the areas of focus with 3-4 specified upper division courses. In addition to such course work requirements, participation in a variety of on and off campus production experiences is required as a part of the practicum component of the program. Before the completion of 15 semester credit hours in the major, each student intending to declare a theatre emphasis will be required to qualify through an audition/interview process conducted each semester by the theatre faculty. Graduation with an emphasis in theatre will depend upon the earning of a grade of C or better in all major course work, as well as in the successful completion of an exit audition/examination consisting of a full faculty review of student performance in acting, directing, theory, history, applied theatre, design, or management. Fifty percent of the courses for the major must be taken from CU-Denver faculty.

Core Courses Semester Hours
THTHR. 1701. Introduction to Theatre ... 3
THTHR. 2802. History of Theatre ... 3
THTHR. 2501. Oral Interpretation of Literature ... 3
THTHR. 2761. Stagecraft ... 4
THTHR. 2732. Acting I ... 4
THTHR. 3741. Directing ... 4
THTHR. 4201. Production Process ... 3
THTHR. 4581. Playwriting ... 3
THTHR. 4781. Drama Theory ... 3
Total Semester Hours 30

Electives (12 hours selected from the following)
F A. 1000. Basic Drawing ... 3
or
F A. 1500. Basic Sculpture ... 3
MUS. 1060. Music Fundamentals ... 3
or
MUS. 1820. Music Appreciation ... 3
Two English courses from Shakespeare, British or American Drama or Film History ... 6

Acting/Directing Focus:
THTHR. 3734. Acting II ... 4
THTHR. 4734. Acting III ... 4
THTHR. 2554. Voice and Diction (up to 6 hours) ... 3
THTHR. 2604. Stage Movement (up to 4 hours) ... 2
THTHR. 3504. Oral Interpretation of Poetry ... 3
THTHR. 4744. Advanced Directing ... 4
FA. 4520. Performance/Installation ... 3
Total Semester Hours 12

Theory/History Focus:
THTHR. 4705. American Theatre History ... 3
THTHR. 4585. Playwriting: The Long Form ... 3
THTHR. 4525. Theatre Criticism ... 3
THTHR. 4805. Historical Perspectives: Topics ... 3
ENG. 3001. Critical Writing ... 3
or
ENGL. 2004. Advanced Composition ... 3
Total Semester Hours 12

Design/Technical Focus:
THTHR. 3706. Scenic Design ... 4
THTHR. 3806. Lighting Design ... 4
THTHR. 4836. Advanced Lighting Design ... 4
THTHR. 4756. Advanced Scenic Design ... 4
F A. 1200. Basic Painting ... 3
F A. 2400. Visual Studies ... 3
THTHR. 4706. Design Perspectives: Topics ... 3
Total Semester Hours 12

Special Audience Focus:
THTHR. 4357. Creative Drama ... 3
THTHR. 3304. Oral Interpretation of Poetry ... 3
THTHR. 2734. Stage Movement ... 3
THTHR. 3667. Theatre for Children ... 3
THTHR. 4987. Applied Theatre Perspectives ... 3
Total Semester Hours 12

Theatre Administration Focus:
THTHR. 4525. Dramatic Criticism ... 3
MUS. 4730. Legal Environment in the Arts ... 3
MKTG. 3000. Principles of Marketing ... 3
ACCT. 2000. Introduction to Accounting ... 3
CMU. 4240. Organizational Communication ... 3
Total Semester Hours 12

In addition to the major course work, a total of 6 hours is required in theatre practice. Students will fulfill this requirement with experience from at least two options as outlined below:

As an integral part of the Denver theatre community, the theatre program at CU-Denver is dedicated to the continuation and development of such interactive programs as the Family Festival of the Arts, Works in Process, and The Performance Forum which facilitate a coordination of efforts among the Denver area theatres, cultural institutions, and the University. In order to increase the range of practical and critical experience, each theatre major will see and evaluate at least 6 theatre productions in the Denver area each term. These experiences test the assumptions and beliefs introduced in the classroom and provide the foundation for the bridge between the study of and the participation in the theatre. As majors demonstrate proficiency in performance, design, and critical skills special internships in a variety of capacities may be arranged with affiliated theatres through the practicum options in theatre practice.

Depending on the individuals actual program of study, a degree in communication and theatre with an emphasis in theatre can provide a graduate with useful technical and practical skills. But, more importantly, students will gain a critical insight into theatre as a human enterprise wherever it occurs. Through examining and experiencing theatre potential to achieve human value, students develop personal, aesthetic, and social principles which will guide them to innovative career choices in the theatre and allied fields.

Graduate

Applicants are admitted to the graduate program in communication and theatre on the basis of their academic records and recommendations. While there are no specific prerequisites beyond those required by The Graduate School, students admitted who are unable to offer a substantial number of semester hours of work in the area of their intended specialization or allied fields must expect that a significant number of additional courses and semester hours will be required of them in order to make up deficiencies.

Courses not taught in the theatre department

GRAND TOTAL HOURS: 60 (48 in major + 12)
Degree Requirements

Every student must take a diagnostic examination before completing 9 semester hours.

For every student who declares intention to qualify for an advanced degree, an advisor and committee will be selected not later than the beginning of the student's second semester (or second summer term) in residence. It is the duty of this advisor and committee to assume the responsibility for (1) approving the student's graduate program, and (2) evaluating the student's qualifying examination, thesis, and comprehensive final examination.

At least two courses (4 to 8 hours) may be taken outside the department or outside the departmental area(s) of concentration.

Plan I Option. With Thesis. After any undergraduate deficiencies have been removed, students under Plan I must normally earn 27 semester hours of which a minimum of 16 must be earned in one major area. At least two courses (4 to 8 hours) must be taken outside the department. Four to 6 thesis credit hours may be counted toward the 27-hour requirement.

The Plan II Option, Without Thesis. Available at CU-Denver only upon application.

Courses at the 5000 level or above may be applied toward the graduate degree by graduate students in theatre. Some courses are available on the Boulder campus; inquiry should be made.

The graduate courses in communication and theatre are also applicable to the Master of Humanities program at CU-Denver.

For more information, students should contact the graduate advisor.

COURSES

THTR. 1701-3. Introduction to Theatre. Discussion, workshops, and lectures designed to discover, analyze, and evaluate all aspects of the theatre experience: scripts, acting, directing, staging, history, criticism, and theory. Playgoing and field trips to several Denver area theatres, demonstrations, and participation in live productions.

THTR. 2501-3. Introduction to Oral Interpretation. Examination of different theories of oral performance of literature through experimentation, discussion, and performance of myth, short story, drama, the essay, biography, letters and diaries. Each performance is designed to challenge the students current level of competence. Suggested prereq., ENGL. 1200 or equivalent.

THTR. 2554-3. Voice and Diction. Studio/workshop class designed to introduce the physiology and theory of vocal production, to analyze specific problems in voice and diction in order to develop the actors vocal instrument.

THTR. 2702-2. Stage Movement. Analysis and practice of stage movement, including basic techniques in gesture and mime as related to prosenium, thrust, and arena staging.

THTR. 2704-2. Acting I. Study and workshop experience in basis techniques of stage movements and role portrayal including improvisations, psychological gesture, body and mind concentration, and vocal gesturing. Several short monologues and duets are designed to solve particular characterization problems.


THTR. 2791-2-4. Theatre Practice: Departmental Production. Practicum component of theatre emphasis requirement through participation in departmental production. Credit hours (from 2-4) will be determined by faculty advisor and are dependent on level of responsibility in the production.

THTR. 2792-2-3. Theatre Practice: Multi Arts/Performance Art. Practicum component of theatre emphasis requirement through participation in an integrated arts performance piece. Credit hours (from 2-3) will be determined by faculty advisor and are dependent on level of responsibility in the production.

THTR. 2793-1-2. Theatre Practice: Affiliated Theatre. Practicum component of the theatre emphasis requirement through participation in a production at an affiliated theatre in the Denver metro area. Credit hours (from 1-2) will be determined by faculty advisor and are dependent on level of responsibility in the production.

THTR. 2794-1-2. Theatre Practice: Second Stage. Practicum component of the theatre emphasis requirement through participation in a Second Stage production. Credit hours (from 1-2) will be determined by faculty advisor and are dependent on level of responsibility in the production.

THTR. 2795-2-4. Theatre Practice: Management. Practicum component of the theatre emphasis requirement through participation in stage management, box office management, or public relations for an approved production. Credit hours (2-4) will be determined by faculty advisor and are dependent on level of responsibility in the production.

THTR. 2802-2-3. History of Theatre. Introductory survey course in theatre history which examines major trends in the writing and production of plays from ancient Greece to contemporary times.

THTR. 2935-2-4. Management Internship. Practicum component of the theatre emphasis requirement through participation in a management internship at a designated cultural facility in the Denver metro area. Credit hours (from 2-4) will be determined by faculty advisor and are dependent on the level of responsibility in the internship.

THTR. 3504-3. Oral Interpretation of Poetry. Performance and criticism of primitive poetry, concrete poetry, the ballad, the sonnet, and various modern forms. Each performance is designed to solve a particular problem.

THTR. 3667-3. Theatre for Children. A study of the processes involved in creating substantial theatre for children, including an examination of various sources for dramatizing children's stories, fairy tales, poems, and existing scripts. This course includes a full production of a children's play to be performed by members of the class before audiences of children. Prereq., THTR. 1701 or consent of instructor.

THTR. 3706-4. Scenic Design. An introduction to the principles and practices of scenic design for the theatre. This course will emphasize textual analysis, the aesthetic and practical elements of design, design development, and theatrical graphics. Requirements will include related production experiences with departmental, Second Stage, or directing class productions. Prereq., THTR. 2761 or equivalent.

THTR. 3734-4. Acting II. Structured improvisations and fully prepared scene studies leading to advanced work in characterization. Methods of discovering and utilizing the range of creative potential in playscripts will receive particular emphasis. Prereq., THTR. 2732.

THTR. 3741-4. Directing I. A study of the directors function in the live theatre with particular emphasis on play analysis and the relationship of creative communication existing between the director and the production team. Workshop experiences include experimental scene work for prosenium, thrust, and arena staging. Prereq., THTR. 2732 or equivalent.

THTR. 3806-4. Lighting Design. An introduction to the history, theory, practice, and equipment for lighting performing arts productions. This course will emphasize textual analysis for lighting design, basic electricity, lighting control and equipment, safety practices, and lighting graphics. Requirements will include related production experiences with departmental, Second Stage, and directing class productions. Prereq., THTR. 2761 or equivalent.

THTR. 3980-1-3. Topics in Theatre. Various topics in the study of the theatre of special interest to non-majors as well as majors with an emphasis in theatre.

THTR. 3981-1-3. Topics in Theatre. Various topics in the study of the theatre of special interest to majors with an emphasis in theatre, and often required for one or more areas of focus.

THTR. 3982-1-3. Topics in Theatre: Honors in Humanities Cluster. Specific
topics courses designed as cluster courses for the Honors in Humanities program. Titles rotate on a regular basis and include Women in Theatre, Medieval Theatre, Theatre of Revolt, and Radicalism in Drama.

**THTR. 3939-1-3. Internship/Cooperative Education.** Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

**THTR. 4201-3. Production Process.** An overview exploration of the design areas of the performing arts designed for majors in all areas of focus and non-majors with some background in theatre. The contribution of major design components (scenic, lighting, costume, and sound) will be examined in theory and practice. Practicum and lab requirements will involve participation in departmental activities. Attendance and review of productions will be scheduled. Prer., THTR. 1701 or equivalent and 12 upper division hours in theatre.

**THTR. 4357-3. Creative Drama.** The study of creativity, its role and application in dramatics, and the manner in which creative dramatics assist in the growth and development of children and youth.

**THTR. 4525-3. Theatre Criticism.** A study of the role of the critic in the development of the theatre with special focus on the practice of dramatic analysis and critical writing about plays and theatrical productions. Prer., THTR. 1701 or equivalent and 12 upper division hours in theatre.

**THTR. 4581-3. Playwriting: The Short Form.** Writing workshop in one-act plays with special emphasis on the demands of production: space, acting, staging conventions and techniques. Prer., consent of instructor.

**THTR. 4585-3. Playwriting: The Long Form.** Writing workshop in full-length plays with special emphasis on production demands. Prer., THTR. 4750 or consent of instructor.

**THTR. 4667 / 6667-3. Advanced Childrens Theatre.** Members of the class screen and select a play designed for children and their families and then design, audition, rehearse, and provide managerial and technical assistance for in-house audiences and touring.

**THTR. 4703-4. Acting III.** Advanced and intensive work in scene study to include practice in a variety of styles such as Elizabethan, Restoration, Comedy of Manners, and musicals. The focus of the course is the effective use of language and the selection and integration of physical and vocal performance choices. Prer., THTR. 3734 or consent of instructor.

**THTR. 4744-4. Advanced Directing.** Designed to present more complex, analytical, production design and rehearsal process problems for the advanced directing student. Included are concentrations in the history of directing, contemporary directing practice, working with non-realistic theatrical dynamics, experimental rehearsal strategies, and experimental sound and lighting design.

**THTR. 4756-4. Advanced Scenic Design.** Class projects will stress development of graphic techniques, exploration of design styles, and the integration of related theatrical design areas. There will be concentration on scenic design for various theatre forms and performing arts. Requirements may include related production experiences with departmental, Second Stage, affiliated off-campus theatres, and directing class productions.

**THTR. 4781-3. Drama Theory.** Examination of critical and theoretical ideas from Aristotle to the present with special emphasis on the development of each students own evaluative criteria.

**THTR. 4790-1-4. Theatre Practice.** Advanced practicum in production work for an approved production. Credit Hours (1-4) will be determined by faculty advisor and are dependent on level of responsibility in the production.

**THTR. 4836-4. Advanced Lighting Design.** Theory and practice for the adaptation of production lighting to various theatre forms and performance types will be emphasized. Projects will provide opportunity for the development of interpretation and implementation processes. Requirements may include related production experiences with departmental, Second Stage, affiliated off-campus theatres, and directing class productions.

**THTR. 4987-3. Applied Theatre Perspectives: Topics.** A special topics investigation of creativity, communication, counseling, and theatre for families and young adults as well as an exploration into the potential of oral history, folklore, and non-performance oriented theatre techniques.

Upper Division/Graduate Level

**THTR. 4357 / 5357-3. Creative Drama.** The study of creativity, its role and application in dramatics, and the manner in which creative dramatics assists in the growth and development of children and youth.

**THTR. 4581 / 5581-3. Playwriting: The Short Form.** Writing workshop in one-act plays with special emphasis on the demands of production: space, acting, staging conventions and techniques. Prer., consent of instructor.

**THTR. 4667 / 5667-3. Theatre for Children.** A study of the processes involved in creating substantial theatre for children, including an examination of various sources for dramatizing children stories, fairy tales, poems and existing scripts. This course includes a full production of a childrens play to be performed by members of the class before audiences of children. Prer., THTR. 1701 or consent of instructor.

**THTR. 4705 / 5705-3. American Theatre History.** An investigation of American theatres, methods of presentation, audiences, actors, acting, and economics from 1700 to present, emphasizing contemporary practices and values as a way of understanding and appreciating the place of theatre in this country as it has evolved and developed. Prer., THTR. 1701 or 4781 or consent of instructor.

**THTR. 4781 / 5781-3. Drama Theory.** Examination of critical and theoretical ideas from Aristotle to the present with special emphasis on the development of each students own evaluative criteria.

**THTR. 4805 / 5805-3. Historical Perspectives: Seminar Topics.** An investigation of theatres, methods of presentation, audiences, actors, and acting from primitive times to the present, emphasizing perception of contemporary practice and values as a way of understanding and appreciating the place of theatre in historical contexts. Prer., THTR. 1701 or 4781 or consent of instructor.

امرازك لن sprawl en در اكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس للاكیره لعا مس L

Graduate Level


**THTR. 6950-1 to 6. Master’s Thesis.**

Independent Study

**THTR. 2840-variable credit. Independent Study (Undergraduate).**

**THTR. 3840 / 4840-1-3. Independent Study (Undergraduate).** Prer., written consent of supervising instructor.

**THTR. 5840 / 6840-variable credit. Independent Study (Graduate).** Prer., written consent of supervising instructor.

*Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.*
COLLEGE OF LIBERAL ARTS AND SCIENCES

ANTHROPOLOGY

Chair, Anthropology and Sociology: Wanda I. Griffith
Associate Chair Anthropology: Craig R. Janes
Office: NC 3012
Telephone: 556-3557
Faculty: Professors: Lorna G. Moore, Duane Quiatt
Associate Professor: Janet R. Moore
Assistant Professors: Eric Arnould, Craig R. Janes
Instructor: Linda Curran-Evenett
Adjunct: Richard G. Conn, Jane S. Day, James Grady, Colby R. Hatfield, Warren Herr
Adjoint: Jack E. Smith
Emeritus: Robert A. Aldrich

Undergraduate

Anthropology is the study of human origins and evolution, present conditions of human life, and future prospects. It considers human beings as biological and as social entities and seeks to explain both diversities and commonalities of peoples and cultures. For undergraduates, anthropology provides a rich overview of human life. It also introduces them to a variety of skills and practical research methods which anthropologists apply in laboratory and field studies of the ecological constraints on human existence, the cultural bases of individual and organizational behavior, and, in general, problems and circumstances relating to the maintenance of healthy, productive human action in the world today.

Anthropological training provides entry to a variety of careers in archaeology, museology, education, community service, public administration, and international affairs and business. The specific skills which it provides are useful to students of environmental design, city planning, community development, the medical and nursing professions and allied health sciences, law, public affairs, and secondary education.

Requirements for the Major. Undergraduates majoring in anthropology must complete a minimum of 30 semester hours in anthropology with grades of C or better.

Sixteen hours must be upper division. Fifteen hours must be taken from CU-Denver faculty. Not more than 48 hours in the major will count toward the 120-hour graduation requirement.

The following courses are required, or competence in course content must be demonstrated:

1. ANTH. 1031-3. Introduction to Anthropology I: Ancestors ANTH . 1041-3. Introduction to Anthropology II: Cultural Diversity
2. Two of the following:
   ANTH. 3103-3. Human Culture
   ANTH. 3121-3. Nature of Language
   ANTH. 3301-3. Archaeology and Prehistory
   ANTH. 3501-4. Human Biology

All of the above courses are offered annually; ANTH. 1031-3 or 1041-3 usually are offered in the summer as well. ANTH. 1031-3 need not be taken before ANTH. 1041-3.

Requirements for the Minor. For an undergraduate minor in anthropology, a minimum of 12 semester hours in anthropology must be completed with an average grade of C or better. Three of the 12 hours must be upper division and 6 must be taken from CU-Denver faculty. Courses taken must include the following:

1. ANTH. 1031-3. Introduction to Anthropology I: Human Ancestors or ANTH. 3501-4. Human Biology
2. Two of the following:
   ANTH. 3103-3. Human Culture
   ANTH. 3121-3. Nature of Language
   ANTH. 3301-3. Archaeology and Prehistory
   ANTH. 3501-4. Human Biology

Departmental Honors. Students wishing to graduate with departmental honors in anthropology (cum laude, magna cum laude, and summa cum laude) must have at least a cumulative grade-point average of 3.2 and a 3.2 or higher in anthropology. Additional requirements are available in the anthropology/sociology office. Qualified students are encouraged to apply for the Honors program no later than the beginning of their senior year.

Area Requirements. Anthropology courses may satisfy humanities, natural and physical sciences, and social sciences area requirements, depending on course content. When in doubt, students should check with the department secretary or undergraduate advisor.

Graduate

The unique intellectual challenge of anthropology is to integrate diverse practical study approaches and to synthesize knowledge from both biological and sociocultural research domains in seeking solutions to problems faced by human societies in today's world. Individual courses in biological and cultural anthropology, archaeology, primatology, and linguistics cut across lines which traditionally have separated the humanities, the social sciences, and the natural sciences. Because of this integrative perspective on the human condition and the training provided in objectively assessing cultural patterning and social interaction, an anthropology M.A. provides a versatile base for professional career development.

The CU-Denver Department of Anthropology offers an M.A. degree in four areas of concentration: medical anthropology, applied anthropology, foundations of human behavior, and general anthropology. Each of the four concentrations begins with a common core of classes designed to acquaint the student with the theoretical perspectives and methodological orientations within anthropology.

Common Core Courses

All students will be required to take the following three courses:

ANTH. 6103-3. Contemporary Theory in Cultural Anthropology
ANTH. 6503-3. Contemporary Theory in Biological Anthropology
ANTH. 5053-3. Quantitative Methods in Anthropology

Areas of Concentration

Beyond the common core, students wishing to specialize in medical anthropology, applied anthropology, or foundations of human behavior must complete an additional 6 hours of required course work. Students may then choose from a range of electives to round out their program. Students wishing to complete the general anthropology track are required to take only the common core courses, beyond which they simply choose the appropriate number of electives. The areas of concentration and course requirements for completing a concentration are as follows:

MEDICAL ANTHROPOLOGY emphasizes the importance of biological and cultural factors in the determination of health and sickness. The approach is biocultural, integrating knowledge from the medical sciences and the social sciences concerning causes of sickness and sources of treatment for restoring health. Courses in the department are complemented by electives in other departments (sociobiology, biology, psychology) and programs on this campus (health administration, education, architecture
and planning) and at the Health Sciences Center (Schools of Medicine, Preventive Medicine, and Nursing).

MEDICAL ANTHROPOLOGY COURSES

ANTH. 5013-3. Biocultural Foundations of Health
ANTH. 5023-3. Comparative Medical Systems

APPLIED ANTHROPOLOGY COURSES

ANTH. 5124-3. Applied Cultural Anthropology

FOUNDATIONS OF HUMAN BEHAVIOR

is for students who wish to pursue the study of human behavior from an evolutionary biological base, with emphasis on behavioral ecology and sociobiology. The core requirements for this specialty track are anthropologically based courses in primate and human behavior and ethnology. These may be supplemented by electives from within the department and from related disciplines depending on specific goals. The Certificate in Animal Behavior Studies, comparative social organization, kinship and household, social cognition, or psychological anthropology are concentrations within this field.

FOUNDATIONS OF HUMAN BEHAVIOR COURSES

ANTH. 5525-3. Seminar: Primate Behavior
ANTH. 5545-3. Seminar: Human Ethology

GENERAL ANTHROPOLOGY provides students with a solid background in the theory and methodology of anthropology. This is particularly useful for students planning to pursue the Ph.D. and for those who are well established in their careers and who wish to add the skills and knowledge available within the anthropological perspective. The latter might include people in business and management, the helping professions, and primary and secondary school teachers. Students in general anthropology take the common core plus selected relevant courses according to their orientation.

REQUIREMENTS FOR ADMISSION

Application is open to holders of a B.A., B.S., or higher degree in any field. Acceptance is competitive. It is based on an undergraduate record of good quality (3.00 or better grade-point average for all undergraduate studies), prior training in anthropology (18 semesters minimum), GRE verbal and quantitative scores, 3 letters of recommendation, and the applicant's purpose in pursuing the degree. Two copies of transcripts from all undergraduate institutions attended are also required. A student without prior anthropology training may be admitted to the program but may be required to make up deficiencies without graduate credit or may choose to gain the necessary background as a non-degree student before beginning the graduate program. With this flexibility in mind, applications are welcome from individuals pursuing particular interests and careers, especially in fields pertaining to the medical anthropology and applied anthropology areas. Departmental deadlines for receipt of all application materials is April 15 for fall entrance and October 15 for spring admission.

PLAN OF STUDY

Students pursuing the M.A. degree under Plan I must take 30 semester hours of course work, of which 6 will be allocated to a thesis, either through the mechanism of thesis hours or through the mechanism of ANTH. 5939, Internship in Anthropology. The thesis may consist of a report of original research, a comprehensive evaluation of existing research, or the report of an internship experience in which disciplinary theory is applied to a practical question or series of practical questions.

Students specializing in the applied anthropology or medical anthropology tracks are strongly encouraged to complete their M.A. under Plan I, but also may complete their degree under Plan II (non-thesis). Students pursuing the M.A. degree under Plan II must take 36 hours of course work. All students must pass a 4-hour comprehensive examination taken ordinarily in the fourth semester of full-time graduate study, and no later than the fifth semester of full-time graduate study.

Under both Plan I and Plan II, students may apply up to 9 hours of study in disciplines outside of, but related to, the discipline of anthropology with the approval of the graduate advisor. Such courses must be taken at the 5000 level or above. A minimum of two full semesters devoted to advanced study is required by The Graduate School; no more than 3 years for attaining the M.A. degree is strongly encouraged. Ordinarily, two years of full-time participation is required to complete the M.A. degree.

Further information concerning admission, programs of study, or other items of interest may be obtained by writing the Director of Graduate Studies, Department of Anthropology, University of Colorado at Denver, 1200 Larimer Street, Denver, CO 80204. For general Graduate School requirements and application information, see The Graduate School section of this catalog.

COURSES

ANTH. 1031-3. Introduction to Anthropology I: Human Ancestors. Fall, Spring. The study of human origins and the prehistory of humankind, with emphasis on physical anthropology and archaeology. Consideration of our own species, Homo sapiens, in relation to contemporary nonhuman primates as well as ancestral hominid species. Culture is treated in this course as a primary human adaptation. ANTH. 1041 treats in detail cultural diversity and regularities among living and recent peoples. Together, ANTH. 1031 and 1041 constitute an introduction to anthropology. They may be taken in either order.


ANTH. 2102-3. Peoples and Cultures of the World. Fall. An anthropological tour of the world's cultures through films and readings. The course will focus on selected cultures from each of the major geographic areas of the world, representing different levels and types of complexity.

ANTH. 2122-3. Sex and Gender. The study of sex as a factor in human evolution, contemporary biological variation, and in the allocation of roles and responsibilities in different cultures. Special emphasis will be placed on roles and attributes of women.

ANTH. 2302-3. The Rise of Civilizations. Spring. Most of mankind's great achievements, such as learning how to use tools, domesticaing plants and animals, the use of metals, and the development of cities, occurred in the prehistoric period prior to the invention of writing. These achievements and the role of archaeology in illuminating the prehistoric record is the subject of this course.

ANTH. 2502-3. Human Evolution. Fall, Spring. An anthropological approach to the study of human lifeways as the outcome of both cultural and biological evolution. In this course Homo sapiens is treated as an animal species (just another unique species) which occupies a cultural ecocniche.
ANTH. 2700-2790-3. Current Topics in Anthropology. A flexible format for dealing with a specific topic of special interest in anthropology, on an introductory level, such as aging, race and prejudice, science and human values, warfare and aggression, ethnicity, cultural diversity through film, myth and folklore, anthropological approaches to world problems, and Colorado prehistory. The specific topic explored in a given semester is to be announced in the Schedule of Classes.

ANTH. 3002-3. Health and Culture. Why are we healthy and ill, what do we do to get well? Health and disease are viewed to be a consequence of complex interactions between people, the environments in which they live, the agents of disease, and the systems of treatment and prevention developed by culture. The biological and cultural determinants of health and disease are explored in our society and cross-culturally.

ANTH. 3101-3. Human Culture. Spring. Covers current theories in cultural anthropology and discusses the nature of fieldwork. Major schools of thought and actual field studies are explored. An emphasis also is placed on anthropological data gathering, analysis, and writing.

ANTH. 3121-3. The Nature of Language. The origin and evolution of language; its special relationship to the human brain; and communication systems of animals, especially nonhuman primates. Other topics include language acquisition, language pathology and the study of nonverbal communication.

ANTH. 3160-3. Political Anthropology. Analysis of institutions of political control both comparatively and from an evolutionary perspective; the interconnections between political and other aspects of human cultural systems.

ANTH. 3180-3. Organizational Culture. Examination of concepts of culture fundamental to anthropological research in human organization and to current theories of organizational management. This course is designed for the professional student, to provide an appropriate study base for those engaged in and affected by day-to-day administrative applications of ideas drawn from anthropological theory and research.

ANTH. 3301-3. Archaeology and Prehistory. Fall. An introduction to the subject of archaeology which provides an appreciation of the major achievements of archaeologists through review of some of the major excavation projects throughout the world. Emphasis on landmark projects which help clarify humankind's progressive achievement of civilization.

ANTH. 3320-3. Old World Archaeology. This course will review 3.5 million years of human cultural development during the prehistoric period in Africa, Asia and Europe. Major topics will include: tool use, origins of fire, the development of metallurgy, the domestication of plants and animals and the rise of cities and the state. If modern civilization can be said to have its origins in the prehistoric period, the same can be said of many of our modern problems.

ANTH. 3340-3. Pre-Columbian America: Archaeology of the New World. A study of the native peoples of the New World from the time of the earliest hunters to the rise of agriculture and civilization. Considerations of the origin and conditions of a broad sample of societies drawing upon both archaeological and ethnographic information, and the general impact upon New World societies of Europeans after Columbus reached the New World.

ANTH. 3501-4. Biological Anthropology. Spring. Human biological evolution from primate ancestors and fossil hominids to modern Homo sapiens; genetic mechanisms of evolution; genetic and physiological variation in contemporary human populations. Three hours of lecture and one 1-hour lab each week.

ANTH. 3520-3. Foundations of Primate Behavior. Study of nonhuman primate behavior with emphasis on understanding social behavior, ecology, and issues related to human evolution.

ANTH. 3540-3. Foundations of Human Behavior. Human behavior in comparative and evolutionary perspective, emphasizing: 1) social cognition in nonhuman primates, 2) application of ethological and sociobiological principles to the study of human action, 3) problems and methods of unobtrusive data collection in natural settings. This course is designed for both majors and non-majors as an introduction to human ethology. Prereq., for 4000 level, college algebra or its equivalent; for 5000 level, graduate status in addition to 4000 level prerequisite.

ANTH. 4000-1-3. Special Anthropological Problems. For majors in anthropology or consent of instructor; for 4020, introductory course in cultural anthropology or consent of instructor; for 5000 level, same as for 4020 and graduate standing.

ANTH. 4020/5024-3. Comparative Medical Systems. Spring. Systems of disease etiology and classification, the therapeutic encounter, varying roles of healer and patient, the cultural bases of healing systems, prevention, and the relationship of healing systems to other institutions in culture will be explored. Course will focus on U.S. as well as on Western systems. Prereq., for 4020, introductory course in cultural anthropology or consent of instructor; for 5024, same as for 4020 and graduate standing.

ANTH. 4051/5053-3: Quantitative Methods in Anthropology. Fall. A survey of the ways of deriving meaning from anthropological data by numerical means including, but not confined to, basic statistical procedure. Prereq., for 4000 level, introductory course in cultural anthropology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4100/5100-3: History of Anthropology. Foundations and development of major concepts and approaches in the study of the relationship between culture and social character and between culture and individual personality. Anthropological perspectives on the effects of various sociocultural contexts on individual experience. Prereq., for 4000 level, introductory course in cultural anthropology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4110/5115-3: Urban Anthropology. Spring, alternate years. An anthropological approach to the comparative study of factors influencing urbanization in different parts of the world along with the implications of environments, economy, values, and psychology of urban living in general. Cross-cultural, but with emphasis on the modern Western world. Prereq., for 4000 level, introductory course in cultural anthropology or consent of instructor; for 5000 course level, same as for 4000 level and graduate standing.

ANTH. 4120/5125-3: Applied Cultural Anthropology. Fall, alternate years. Concept, methods, and problems in the application of anthropology to community and institutional organization, development and administration; exemplified through analysis and discussion of U.S. and cross-cultural case materials. Urban and medical problems as well as ethical issues to be included. Prereq., for 4000 level, introductory course in cultural anthropology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.

ANTH. 4010/5014-3: Biocultural Foundations of Health. Fall. Concerned with the underlying biological and cultural determinants of health throughout the human life cycle in cross-cultural perspective. This is the first of the two-course sequence in medical anthropology. The second is ANTH. 4020/5024, Comparative Medical Systems. Prereq., introductory course in anthropology or consent of instructor.

ANTH. 4020/5024-3: Comparative Medical Systems. Spring. Systems of disease etiology and classification, the therapeutic encounter, varying roles of healer and patient, the cultural bases of healing systems, prevention, and the relationship of healing systems to other institutions in culture will be explored. Course will focus on U.S. as well as on Western systems. Prereq., for 4020, introductory course in cultural anthropology or consent of instructor; for 5024, same as for 4020 and graduate standing.
ANTH. 4130/5130·3. Comparative Religious Systems. A cross-cultural analysis of religious belief and behavior. Emphasis will be placed on religions found among non-Western cultural groups, and will include consideration of how major religions of the world are manifested on local levels. Prer., for 4000 level, introductory course in cultural anthropology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4150/5150·3. Anthropology of Women. The chief concern of this course is the relationship between ourselves and our surroundings, the very immediate ways in which the environments in which we live affect us. The view is of ourselves as a part of, not apart from, these environments. Prer., for 4000 level, introductory course in biological/physical anthropology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4170/5170·3. Comparative Social Organization. Principles in the comparative study of human social systems, types of social structure, social control, sociocultural integration, and processes of social change and societal development. Focus on the analysis of ethnographies. Prer., for 4000 level, introductory course in cultural anthropology or sociology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4190/5190·3. Family Dynamics. The course examines processes of change in values, roles, and relations involved in marriage and family structure, using contemporary cross-cultural materials leading to understanding of such problems as generation gap and sex role change. Special attention is given to changing structure of authority, economics, and the emotional components associated with marriage and family life of today's America. Prer., for 4000 level, upper division standing; for 5000 level, graduate standing.

ANTH. 4200/5200·3. The Anthropology of Women. A comparative analysis of gender-based status and social roles. It examines in cross-cultural context the relations among women's status and subsistence and reproductive activities, the division of labor by sex, ideology, and political economy. Prer., for 4000 level, upper division standing; for 5000 level, graduate standing.

ANTH. 4220/5220·3. Culture and Community. A presentation of the community study method from the perspective of anthropology and as a widely applicable research technique in planning, development, and other areas of public affairs. Also includes analyses of case studies and student field research. Prer., for 4000 level, introductory course in cultural anthropology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4310/5310·3. Anthropology of the American Southwest I: Mogollon and Hohokam. Considers the origins, characteristics, and interrelationships of the Mogollon, Hohokam, and the cultures of adjacent Mexico. Each of these cultures represents an adaptive response to specific environmental conditions. Interactions with the Anasazi culture to the North are explored. Prer., for 4000 level, introductory course in archaeology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4340/5340·3. Archaeology of the American Southwest II: Anasazi. Considers the origins, characteristics, adaptive response, and interrelationship of the Anasazi culture and its variants found in the Four Corners area of Arizona, Colorado, New Mexico, and Utah. Interactions with the Mogollon and Hohokam cultures to the South and Fremont culture to the North will be explored. Prer., for 4000 level, introductory course in archaeology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4350/5350·3. Archaeology of the American Southwest III: Early Puebloan. Describes as the finest cavalry the world has ever seen, the Plains Indians were the latest in a line of peoples who adapted to life on the Great Plains. The last 12,000 years provide a picture of challenging cultural adaptation through time. Prer., for 4000 level, introductory course in archaeology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4360/5360·3. Conservation Archaeology. Philosophy and legislation involved with conservation (contract) archaeology. Contract negotiations and budgetary involvements of government agencies and universities. Analysis of environmental impact statements for archaeological projects. Prer., for 4000 level, introductory course in archaeology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4390/5390·3. Research Methods in Archaeology. Methods and theories of archaeology are used to scrutinize the collection and interpretation of data and the relationships of archaeology to other disciplines. Course content will vary slightly each time, offered in response to student needs and the availability of projects; for example, laboratory work urban excavation, survey and mapping, etc., but the core material will be learning and criticizing basic archaeological assumptions. Prer., for 4000 level, introductory course in archaeology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4500/5500·3. Human Origins. Detailed consideration of the fossil evidence for human evolution. History, description, interpretation of key fossils, and review of current and controversial issues. Prer., for 4000 level, introductory course in biological or physical anthropology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4560/5560·3. Human Ecology. Fall, alternate years. A study of demographic and ecological variables as they relate to man. Aspects of natural selection, overpopulation, and environmental deterioration will be considered. Prer., for 4000 level, introductory course in biological or physical anthropology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

ANTH. 4700/5700·3. Ethnography of the American Southwest. Geographic affiliations, culture, history, traditional ways of life, and culture change in the American Southwest. Prer., for 5000 level, graduate standing.


ANTH. 4740/5740·3. Ethnography of Mexico and Central America. Geographic affiliations, culture, history, traditional ways of life, and culture change in Mexico and Central America. Prer., for 5000 level, graduate standing.

ANTH. 4760/5760·3. Contemporary American Indian Cultures. Beginning with the historical background on American Indian acculturation and persistence, but emphasizing present-day relations between Indian communities and the dominant society, stressing conditions and events in

1 Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.
Denver and the Southwest generally. Prer., for 5000 level, graduate standing.

ANTH. 4780/5780-3. Ethnography of the South Pacific. An exploration of the native cultures of Oceania, including those of Hawaii, Samoa, New Guinea, Fiji, and the many islands of Micronesia. Emphasis is placed on the ways of life of the indigenous population, their relations with each other, and the effects of culture change in recent times. Prer., for 5000 level, graduate standing.

ANTH. 4910/5910-3. Archaeological Field and Laboratory Research. Students will participate in archaeological field research and data recovery, and will conduct laboratory analysis of materials recovered in the field. Emphasis will be placed on excavation technique and accuracy of record keeping. Prer., for 4000 level, introductory course in archaeology or consent of instructor; for 5000 level, same as for 4000 level and graduate standing.

Graduate Level

ANTH. 5526-3. Seminar: Primate Behavior. Examination of morphology and behavior of selected primate species from a comparative evolutionary point of view, with emphasis on social behavior, ecology, and issues relating to human evolution. Prer., undergraduate course work in anthropology or consent of instructor, and graduate standing.


ANTH. 5939-1-6. Internship in Applied Anthropology. Fall, Spring. Internship placements in a community setting that involves the application of disciplinary concepts, theory, and skills to practical issues in a supervised employment situation. Students will produce a written report emphasizing the relationship of theory to practice. Under certain circumstances such a report may fulfill M.A. thesis requirements under Plan I. Prer., graduate standing in anthropology.

ANTH. 6000 to 3. Seminar in Current Research Topics. An inquiry into current research of critical and general interest to anthropologists. Variable format. Prer., graduate standing.

ANTH. 6020-3. Interdisciplinary Seminar. A consideration of interdisciplinary problems that involve anthropology and related fields such as history, the behavioral disciplines, and the natural sciences. Prer., graduate standing.

ANTH. 6040-3. Topics in Medical Anthropology. Fall, alternate years. A flexible seminar format for dealing with topics of special interest in medical anthropology on an advanced graduate level. Topics to be considered will vary from semester to semester. Examples include high altitude adaptation, ethnographic perspectives on substance abuse, the health consequences of cultural change, and cross-cultural psychiatry. Prer., undergraduate course work in anthropology or consent of instructor, and graduate standing.

ANTH. 6063-3. Qualitative Data Analysis. Much of the data collected in the course of research in anthropology and related disciplines are comprised of texts of written or recorded material. This course focuses on the systematic and computer-aided qualitative analysis of real texts. Emphasis will be placed on a step-by-step and in-depth discussion of the elements of qualitative analysis, including domain and theme coding, sorting and retrieval, inductive analysis, and methods for writing up results. Prer., computer literacy and graduate standing.

ANTH. 6103-3. Seminar: Contemporary Culture Theory. Fall. The role and application of theory in cultural and social anthropology. An in-depth inquiry into important theories and their methods through extensive primary source reading. Practice in formulating theory, critical thinking, and theoretical writing will be emphasized. Prer., undergraduate course work in cultural anthropology or consent of instructor, and graduate standing.

ANTH. 6120-3. Seminar: Comparative Social Systems. Inquiry into current cross-cultural research on the structure and function of social units, overall societal integration, and processes of change in social organization. The emphasis will be on contemporary complex societies, urban, industrial, and alternative systems. Prer., undergraduate course work in cultural anthropology or consent of instructor, and graduate standing.

ANTH. 6140-3. Research Techniques in Cultural Anthropology. An introduction to the methods and techniques used in cultural anthropological field work along with the logic, assumptions, implications of theory-building and hypothesis-testing in comparative research in cultural anthropology. Special attention is given to a field work project as a practical training experience and as an application of the established anthropological methods. Prer., undergraduate course work in cultural anthropology or consent of instructor, and graduate standing.

ANTH. 6300-3. Seminar: Archaeology of Selected Areas. Fall, alternate years. Consideration of archaeology of a specific area, either geographical or topical. Areas to be selected in terms of current research interests. Prer., undergraduate course work in archaeology or consent of instructor, and graduate standing.

ANTH. 6503-3. Contemporary Theory in Biological Anthropology. Spring. The role and application of theory in biological anthropology and human biology more generally, with particular attention to the relation between developments of theory and advances in method and technology. The object of this seminar is not comprehensive but rather a detailed and intensive overview of an entire subdiscipline, thorough analysis of select representative problems and issues. Thus, focal areas of research and theory will vary from year to year. Prer., undergraduate course work in biological/physical anthropology or consent of instructor, and graduate standing.

ANTH. 6520-3. Seminar: Physical Anthropology of Selected Areas. A detailed consideration of the morphological and genetic range of variability of major continental divisions of mankind. Prer., undergraduate course work in biological/physical anthropology or consent of instructor, and graduate standing.

ANTH. 6540-3. Research Methods in Physical Anthropology. A survey of methods and procedures for obtaining and interpreting data in physical anthropology, with practice in selected techniques. Prer., undergraduate course work in biological/physical anthropology or consent of instructor, and graduate standing.

ANTH. 6830-1-6. Guided Research. Directed individual research, field or library, employing specific anthropological theories, methods, and techniques, any subfield, consent of instructor required.


Independent Study


ANTH. 5840-1-6. Independent Study. Directed study based on a specific subfield of anthropology. Consent of instructor required.

BASIC SCIENCE, MASTER OF

This multidisciplinary program leads to the Master of Basic Science (M.B.S.) degree. It provides an opportunity to extend or broaden training in mathematics, computer science, biology, chemistry, geology, and physics.

The program is designed as a career enhancement degree for professionals such as government and industrial scientists, teachers, engineers, and business persons.

CU-Denver strives to offer its graduate students a maximum of flexibility in the design of their programs. The M.B.S. degree is less restrictive in its requirements than traditional M.S. programs, and can be planned to meet...
specific needs or individual preferences. Students design their own degree plans with an academic advisor to meet program requirements.

Students in the program have the opportunity to take courses designed for professional growth in their area of interest. For the teaching professional, several courses relating to the needs of teachers have been created in the M.B.S. program.

Within the program there are three options from which to choose: mathematics, applied science, and computer science. Students are required to complete a project or thesis that explores in depth some particular area of interest within their chosen option.

The length of time it takes to complete the degree is determined by the student's own schedule flexibility; many finish within two years. The program requires completion within five years or in six successive summers. Courses are offered during a wide range of times, and many M.B.S. students complete their curriculum by attending night classes throughout their program.

Requirements for Admission

A student must have had at least 40 semester hours in mathematics, computer science, physics, biology, chemistry, or geology in order to enter the program.

If the student's undergraduate grade-point average is 2.75 or less, the student may be required to take the Graduate Record Examination.

Application forms for admission to the M.B.S. program in the Graduate School may be requested from:

The Graduate School
1200 Larimer Street, Campus Box 163
Denver, CO 80204
Telephone: 556-2663

Requirements for the Master of Basic Science Degree

MATHMATICS OPTION

1. The Course Work Requirements. All candidates choosing the Mathematics Option must complete approved upper division or graduate level electives in biology, chemistry, geology, physics, mathematics, or computer science to complete a 32-semester-hour degree plan.

A reasonable degree of competence is required in at least three broad areas of mathematics. A minimum of 15 semester hours of approved courses at the 3000 level or above in mathematics must be completed for the degree. These courses must include at least one in abstract algebra, one in linear algebra, and one course each from at least two of the following areas: analysis, geometry, numerical analysis, operations research, probability and statistics, mathematical modeling, or discrete mathematics.

To assure breadth in the degree, the candidate must complete a 6-semester-hour approved upper division or graduate level sequence in biology, physics, chemistry, or geology.

To assure depth in the degree, the candidate must complete 12 semester hours of approved graduate course work (i.e., numbered 5000 or above), 6 of which must be in mathematics and another 6 from mathematics, computer science, biology, chemistry, geology, or physics.

The degree plan may include 3 semester hours of courses or seminars at the 3000 level or higher in secondary school mathematics teaching, history of mathematics or science, or philosophy of mathematics or science.

2. The Required Project. All candidates for the Master of Basic Science who choose the Mathematics Option must complete a paper describing an approved research project or other study in the area of mathematics. In order to complete this project, each candidate must register for 2 semester hours of independent study under a faculty advisor no later than the last semester of enrollment for the degree.

3. Oral Presentation. No later than the last semester of enrollment for the degree, the candidate must make an oral presentation before the candidate's Project Committee to present relevant information and answer questions regarding the completed project.

4. Graduate Advisor and the Project Committee. All candidates for the M.B.S. who choose the Mathematics Option must select a faculty advisor in the Department of Mathematics and two other faculty members to serve with the advisor as the candidate's Project Committee. The names of these three individuals must be submitted to the M.B.S. Executive Committee no later than two semesters following full admission to the program.

COMPUTER SCIENCE OPTION

1. The Course Work Requirements. All candidates choosing the Computer Science Option must complete approved upper division or graduate level electives in biology, chemistry, geology, physics, mathematics, or computer science to complete a 32-semester-hour degree plan.

A. Either by previous training or by course work in the degree, candidates must demonstrate facility with a high level language such as Pascal, Modula II, or Ada that includes the ability to use arrays, records, dynamic structures (pointers), and recursion. A core of at least 15 semester hours of approved computer science courses is required including at least one course in each of the following areas: data structures and program design, programming languages and paradigms, and parallel computing (including the high level language Ada).

b. To assure breadth in the degree, the candidate must complete a 6 semester hour approved upper division or graduate level sequence in biology, physics, chemistry, or geology.

c. To assure depth in the degree, the candidate must complete 12 semester hours of approved graduate course work (i.e., numbered 5000 or above), 6 of which must be in computer science and another 6 from mathematics, computer science, biology, chemistry, geology, or physics.

d. The degree plan may include 3 semester hours of courses or seminars at the 3000 level or higher in secondary school computer science teaching, history of mathematics or science, or philosophy of mathematics or science.

2. The Required Project. All candidates for the M.B.S. who choose the Computer Science Option must complete an approved programming project that demonstrates the candidate's ability to apply the principles of modern computer science to solving an appropriate problem. In order to complete this project, each candidate must register for 2 semester hours of independent study under a faculty advisor no later than the last semester of enrollment for the degree.

3. Oral Presentation. No later than the last semester of enrollment for the degree, the candidate must make an oral presentation before the candidate's Project Committee to present relevant information and answer questions regarding the completed project.

4. Graduate Advisor and the Project Committee. All candidates for the M.B.S. choosing the Computer Science Option must select a faculty advisor in the Department of Mathematics and two other faculty members to serve with the advisor as the candidate's Project Commit-
The names of these three individuals must be submitted to the M.B.S. Executive Committee no later than two semesters following full admission to the program.

**APPLIED SCIENCE OPTION**

1. **Course Work Requirements.** All candidates choosing the Applied Science Option must complete approved upper division or graduate level electives in biology, chemistry, geology, physics, mathematics, or computer science to complete a 32-semester-hour degree plan.

   a. A reasonable degree of competence is required in at least three areas of science. A minimum of 15 semester hours of approved courses at the 3000 level or above in science must be completed for the degree. These courses must include at least one in each of three areas from biology, chemistry, geology, and physics.

   b. To assure breadth in the degree, the candidate must complete two semesters of calculus or a 6-semester-hour approved upper division or graduate level sequence in mathematics or computer science.

   c. To assure depth in the degree, the candidate must complete 12 semester hours of approved graduate course work (i.e., numbered 5000 or above), 6 of which must be in biology, chemistry, geology, and physics, and another 6 from mathematics, computer science, biology, chemistry, geology, or physics.

   d. The degree plan may include 3 semester hours of courses or seminars at the 3000 level or higher in secondary school mathematics teaching, history of mathematics or science, or philosophy of mathematics or science.

2. **Required Project or Thesis.** All candidates for the M.B.S. who choose the Applied Science Option must complete a project or thesis. Teachers usually find the non-thesis option to their liking. Most other professionals will find that advancement is dependent upon a quality thesis; the thesis option is, therefore, recommended for them. Candidates must report their choice of the project or thesis option to the M.B.S. Executive Committee by the end of their second semester.

   The thesis option requires 26-28 semester hours of course work and 4-6 thesis credit hours, for a total of 32 semester hours.

   The project option requires that the candidate complete a paper describing an approved research project that demonstrates the candidate's ability to apply principles of applied science. In order to complete this project, each candidate must register for 2 semester hours of independent study under a faculty advisor no later than the last semester of enrollment for the degree. This is in addition to 30 semester hours of required course work, for a total of 32 semester hours.

3. **Oral Presentation.** Under the thesis or project option the candidate must make an oral presentation before a committee to present relevant information and answer questions regarding the completed project or thesis. This must be done no later than the last semester of enrollment for the degree.

4. **Graduate Advisor and the Project/Thesis Committee.** All candidates for the M.B.S. choosing the Applied Science Option must select a faculty advisor and two other faculty members to serve with the advisor as the candidate’s Project or Thesis Committee. The members of the three individuals must be submitted to the M.B.S. Executive Committee no later than two semesters following full admission to the program.

**BIOLOGY**

Chair, Biology and Chemistry: Alan P. Brockway
Office: NC 3205
Telephone: 556-2689
Faculty: Professors: Alan P. Brockway, Linda K. Dixon, Janis W. Driscoll, Emily L. Hartman
Associate Professors: Gerald J. Audesirk, Teresa E. Audesirk, Diana F. Tombok
Assistant Professor: Bradley J. Sth
Instructor: David L. Shugars
Adjunct: Daniel D. Chiras, Mary Lou Rottman
Emeritus Professors: Phyllis W. Schultz, George J. Siemens

Undergraduate

The study of biology introduces the student to the diversity of life, the chemical processes and adaptations shared by species and the interaction of species with their environment. By studying the differing fields of biology, the student begins to appreciate the characteristics of life and the remarkable evolutionary history leading to the present forms, and to understand the advances in biological technology that are transforming our society. Knowledge of the interrelationships between populations and their habitats leads to respect, concern, and a sense of responsibility for our environment.

The biology major prepares a student for graduate study in biology, for professional schools in the health sciences, for a variety of biologically oriented jobs in government and industry, for teaching at various educational levels, or, as with any liberal arts major, for life itself. Students planning on a teaching career should consult with the School of Education for information on teacher certification.

**Requirements for the Major.** Biology majors must complete a minimum of 36 hours of biology, 16 hours of which are to be at the upper division level. Fifteen of the 36 hours are to be taken in residence with CU-Denver biology faculty. Included in the 36 hours are 20-21 hours of biology core courses, with a grade of C or better, required of all majors. At least 4 other courses in biology beyond the core courses, with a grade of C or better, are required to fulfill the rest of the hours. To ensure a proper background for the study of biology, majors are required to take 34 hours of course work in ancillary disciplines. The following biology and ancillary courses are required:

**Biology Core Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Biology I and II (BIOL. 2051, 2061)</td>
<td>8</td>
</tr>
<tr>
<td>Principles of Ecology (BIOL. 3411)</td>
<td>3</td>
</tr>
<tr>
<td>Cell Biology (BIOL. 3611)</td>
<td>3</td>
</tr>
<tr>
<td>General Genetics (BIOL. 3831)</td>
<td>3</td>
</tr>
<tr>
<td>One physiology or morphology course</td>
<td>3-4</td>
</tr>
<tr>
<td>Total biology core</td>
<td>20-21</td>
</tr>
</tbody>
</table>

**Ancillary Core Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Chemistry, two semesters (CHEM. 2031, 2038, 2061, 2068)</td>
<td>10</td>
</tr>
<tr>
<td>Organic Chemistry, two semesters (CHEM. 3411, 3421)</td>
<td>8</td>
</tr>
<tr>
<td>University Mathematics I and II (MATH. 1110, 1120)</td>
<td>6</td>
</tr>
<tr>
<td>Physics (PHYS, 2010, 2020)</td>
<td>10</td>
</tr>
<tr>
<td>Total ancillary core</td>
<td>34</td>
</tr>
</tbody>
</table>

**Departmental Honors.** To qualify for departmental honors a major must have a minimum GPA of 3.2, take at least 6 hours of independent study over two semesters, and pass an oral examination administered by the Biology Honors Committee. For high departmental honors, a major must have a GPA above 3.5, take at least 6 hours of independent study over two semesters, pass an oral examination, and present to and defend before the Biology Honors Committee a thesis based on the independent study work. Any major desiring to pursue departmental honors should consult the chairperson of the Biology Honors Committee during the junior year.

**Requirements for the Minor.** For a biology minor student must complete all biology core requirements with a
minimum of 10 hours in residence at CU-Denver and must have an average of C or better in this course work.

Graduate

The master's program in biology is designed to prepare graduates for research and teaching positions, employment in business and industry, advanced training as secondary school science teachers, and for advanced graduate work at the doctoral level. The M.A. in biology may be obtained with an emphasis in ecology, genetics, plant science, neurobiology, animal behavior, or cell biology.

Two principles have guided the development of the graduate program in biology: These are (1) the belief that a student's program should be tailored to meet the student's specific needs or personal goals and (2) the utilization of all the University's resource facilities, regardless of the campus on which they are located, in order to provide greater opportunity and exposure for the student.

REQUIREMENTS FOR ADMISSION

Applicants must hold a baccalaureate degree from an accredited college or university earned with an overall grade-point average of 3.0 or better. (Exceptions to this grade-point average are made, dependent upon the letters of recommendation made on the student's behalf.) Most applicants have an undergraduate major in biology or its equivalent. Applicants lacking any CU-Denver biology core courses will be expected to correct the deficiency. Students who do not meet the minimum requirements set by the department or The Graduate School may be admitted on a provisional basis as detailed in The Graduate School section in this catalog. The GRE is required of all applicants. Applications are submitted directly to the biology graduate coordinator at CU-Denver.

DEGREE REQUIREMENTS

All course work taken within the department and applied toward the degree must be 5000 level or above. With the advisor's and/or graduate committee's approval, course work at the 4000 level taken outside the department may be applied toward the degree. Two types of degree plans are offered:

Plan I (with thesis) requires 24 semester hours including 4-6 hours of thesis; at least 12 of the total semester hours must be 5000 level or above.

Plan II (without thesis) requires 30 semester hours of which 16 hours must be 5000 level or above.

There is no core of required courses structured into the master's degree program; however, one seminar (1 or 2 hours credit) or BIOL. 5705, Introduction to Research, is required. A course plan is developed by the student and major professor and approved by the student's graduate committee.

ADDITIONAL INFORMATION

The student is referred to the biology graduate coordinator and to the Department of Biology's Master of Arts in Biology brochure which is available in The Graduate School office or the biology department. Specific questions relating to the student's background and specific program needs should be directed to the biology graduate coordinator.

COURSES

BIOL. 1042-3. Basic Biology for the Non-major. Lect. This one-semester survey course is designed to present basic information and concepts of biology as they relate to everyday life. The emphasis is on humans and their relationship to the world. This course will not count toward a major in biology.

BIOL. 1332-1. Topics in Biology. Five-week courses dealing with topics in biology. See Schedule of Classes for current topics. For non-science majors to fulfill the natural science requirements.

BIOL. 1352-3. Biology of Cancer. This course, for non-majors, explores the biological nature of cancer, a disease that strikes one in three Americans. It offers an overview of what recent research has revealed about the causes of cancer, about how it can be treated, and might be prevented. This overview is based on a foundation of knowledge gained from basic research into the behavior and activities of cells, both normal and cancerous. The emphasis is on the biology of cancer at the cellular and molecular level.

BIOL. 2051-3. General Biology I. Fall. Lect. Introduction to five major areas of study: (1) the chemistry of biological systems; (2) the structure and function of the cell; (3) cellular energy transformations (photosynthesis and respiration); (4) genetics (mitosis, meiosis, patterns of inheritance, molecular genetics); and (5) evolution.

BIOL. 2061-3. General Biology II. Spring. Lect! Continuation of BIOL. 2051. Introduction to three major areas of study: (1) animal structure and function, (2) plant structure and function, and (3) ecology.

BIOL. 2071-1. General Biology Laboratory I. Laboratory exercises corresponding to topics covered in BIOL. 2051, emphasizing data collection and analysis, and experimental design. May be taken independently.

BIOL. 2081-1. General Biology Laboratory II. Laboratory exercises corresponding to topics covered in BIOL. 2061, emphasizing data collection and analysis, and experimental design. May be taken independently.

BIOL. 3112-3. Biology of Women. Spring. A survey of women from a biological perspective, encompassing the anatomical, physiological, genetic, and behavioral aspects of women. This course cannot be used to fulfill biology major requirements.

BIOL. 3122-3. Natural History of Colorado. Lect. Introduction to the plains and mountain ecosystems of Colorado — from grassland to tundra. The topographic features, climate, habitats, plants, and animals of each ecosystem are considered. From a geological standpoint, the glacial history and geomorphic processes which have shaped the present Rocky Mountains of Colorado are overviewed. Both plant and animal adaptations to mountain environments are studied. Lecture material is supplemented with slide presentations. Course is intended for nonmajors.

BIOL. 3134-variable credit. Advanced Topics. Periodic examination of current topics in the field of biology.

BIOL. 3142-3. Role of Plants in Today's World. Lect., demo. Focus on crop plants which shape the destinies of civilizations, their centers of origin; beverage, fiber, drug, and medicinal plants; and current issues concerning food crises in third world countries: seed banks and development of improved disease and drought-resistant crops. Course is intended for nonmajors.

BIOL. 3154-4. Plant Physiology. Lect., lab. The basic orientation of the course is toward understanding the functioning of the body as a set of homeostatic mechanisms. Particular emphasis is placed on membrane potentials, muscle, circulation, respiration, digestion, the kidney, the control of metabolism, and acid-base balance. Prer., one year of general biology.

BIOL. 3225-4. Essentials of Human Physiology. Lect., lab. The basic orientation of the course is toward understanding the functioning of the body as a set of homeostatic mechanisms. Particular emphasis is placed on membrane potentials, muscle, circulation, respiration, digestion, the kidney, the control of metabolism, and acid-base balance. Prer., one year of general biology.

BIOL. 3244-3. Human Anatomy. Lect., lab. An introduction to the structural aspects of the human body. Anatomical models, microscope slides, and dissections, including cat dissections, will be used in the lab. Prer., one year of general biology.

1Biology and health science (premed, vet, nursing, etc.) majors must also take the accompanying laboratories, i.e., BIOL. 2071 and 2081.
Biol. 3254-3. Introduction to Animal Behavior. (Psy 3254.) Lect. An introductory survey of the study of the behavior of nonhuman animals. An evolutionary perspective is used to examine the mechanisms of behavioral control in individuals and groups of animals and how animal species adapt to their environment. Prer., one semester of psychology or biology.


Biol. 3411-3. Principles of Ecology. Fall. A lecture course that deals with interrelationships between populations of organisms and their environment. Subject matter includes individual, population, and ecosystem levels of study. The emphasis is on the underlying principles of ecology that involve all types of organisms. Prer., one year of general biology.


Biol. 3654-4. Microbiology. Fall. Lect., lab. A survey of distinguishing characteristics of microorganisms based on structural-functional relationships, taxonomy, growth, and physical chemical agents of control including antibiotics, metabolism, and genetics. Students will be introduced to applied microbiology with an emphasis on infectious diseases, basic concepts of immunology, and microbial ecology. Prer., one year of general biology. Organic chemistry recommended.

Biol. 3724-3. Developmental Psychobiology. (Psy 3724.) Exploration of the biological influences on the development of brain and behavior. Emphasis is on evolution and development, the role of experience in prenatal and postnatal development, the ontogeny of sensory systems, learning and memory, and the biological bases of language acquisition. Prer., general biology or introduction to psychology.

Biol. 3804-4. Developmental Biology. A survey of developing systems including insects, echinoderms, amphibians, birds, mammals, and selected plant type. Content will include gametogenesis, embryogenesis, and a survey of differentiating systems. Prer., one year of general biology.


Biol. 3839-1-3. Internship/Cooperative Education. Designed experience involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

Biol. 4050-variable credit. Advanced Biology. Examination of current topics in the field of biology. Topics vary from year to year.

Biol. 4064-3. Advanced Cell Biology. Lect. This course builds on the foundations laid in the prerequisite courses. Major topics include the functions of cell membranes, energy transduction, and regulation of metabolic pathways. A major emphasis is the control and integration of cellular activities. Prer., Biol. 3611 and Chem. 3411.

Biol. 4394-2. Laboratory in Animal Behavior. (Psy. 4394.) Laboratory projects and field observations of the behavior of animals. Prer. or coreq., Psy. 2254 or Biol./Psy. 4254.

Upper Division/Graduate Level

Biol. 4104/5104-3: Behavioral Genetics. (Psy. 4104.) Lect. Interdisciplinary course on relationships between behavior and heredity with an emphasis on human behavioral genetics. Prer., for 4000 level, general biology or general psychology.


Biol. 4154/5154-3: Environmental Ecology. Lect. Topics in population biology that form a basis for understanding many environmental issues. Material covered includes population growth, demographics, competition, biogeographic theory, and the genetics of small populations. These concepts are applied to issues such as overpopulation, the size of nature reserves, captive breeding, and genetic diversity. Prer., Biol. 3411 or an equivalent introductory ecology course.


Biol. 4254/5254-3: Advanced Animal Behavior. Lect. An advanced course emphasizing the behavioral similarities and differences among animals. Principles of behavior are discussed in a variety of species. Prer., one year of general biology and upper division or graduate standing is required. Biol./Psy. 3254 is recommended.

Biol. 4274/5274-3: Environmental Physiology. Lect. and lab. A look at the physiological mechanisms used by animals and plants in reaction to adapting to changes in such natural environmental parameters as temperature, light, and water availability. The intent is to lay the groundwork for understanding how to approach the study of the effects of changing environments on organisms. Prer., one year of chemistry and one course in either plant or animal physiology.

Biol. 4335/5335-4: Plant Science. In-depth study of the angiosperms (flowering plants), including embryogenesis, structure, function, ecology, and evolution of the group. Emphasis is placed upon morphology and anatomy of all stages of plant development. The reproductive process and embryogenesis are studied in detail. Lect., lab., and some field trips. Prer., one year of general biology.

Biol. 4404/5404-4: The Plant Kingdom. Lect. and lab. Evolution in the plant kingdom will be traced by the study of the structure, function, and ecology of each major plant group — algae through gymnosperms. Angiosperms (flowering plants) are covered in Plant Science. Local Colorado examples will be emphasized in the lab and field.

Biol. 4414/5414-4: Mountain Ecology. In-depth study of mountain plant communities: structure, characteristics, dynamic processes, and interactions with environmental factors. Mountains of Colorado and Rocky Mountains in general are emphasized. Communities are oriented into major mountain ecosystems according to Marr. Some discussion of paleotectonic factors and their influence on plant communities is included. Field and lab. studies emphasize techniques in vegetation analysis (descriptive and quantitative), dendrochronology, vegetation mapping, and use of data analysis systems including statistics. Current survey of literature throughout course is required. Lect., lab., field trips during class time. Prer., one year of general biology. Graduate level option requires additional work in current literature survey and field studies. An independent field project also is required. Biol. 514 not open to students who have had Biol. 414.
**BIOL. 4425/5425-3:** Ecology and Taxonomy of Grassland Plants. Lect., lab. Class-time field trips. A study of the Colorado grasslands from plains to alpine tundra, stressing ecology of the various units, species composition, representative adaptations, habitat variation, and past disturbances. Students will learn to identify the major grassland plants including grasses, sedges, rushes, and composites. Prerequisites: one year of general biology and an ecology course or consent of the instructor.

**BIOL. 4474/5474-4:** Ecological Methods. Lect. and lab. This course deals with the empirical aspects of an ecological study. Students will learn sampling techniques that are used in plant and animal ecology. Emphasis is placed on hypothesis testing, data analysis, and experimental design. Prerequisite: BIOL 3411. BIOL 4474 not open to students who have had BIOL 4474.

**BIOL. 4500/5500-3:** Microcomputers in Biology. Lect. An overview of the various uses of microcomputers in biology including word processing, data bases, data analysis (including statistical analysis), spreadsheets, simulations, and instructional uses. Includes an introduction to Prolog and BASIC programming. There will be both lecture/discussions and individual exercises on a microcomputer.

**BIOL. 4615/5615-5:** Vertebrate Embryology. Introduction to fundamental developmental anatomy including gametogenesis, fertilization, gastrulation, and early organogenesis. The comparative developmental anatomy of the echinoderms, amphibians, birds, and mammals, including the human, is examined. BIOL 3615 not open to students who have had BIOL 4615.

**BIOL. 4705/5705-2:** Introduction to Research. For advanced undergraduates or graduate students this course serves as an introduction to research techniques. Topics will include lab safety, lab and field techniques, and statistics. Prerequisite: one year of general biology.

**BIOL. 4974/5974-3:** Evolution. Lect. The course explores the historical development of the modern evolutionary synthesis, the principles and mechanisms of evolution, and the current controversy between punctualism and gradualism.

**Chemistry**

Chair, Biology and Chemistry: Alan P. Brockway
Office: NC 3205
Telephone: 556-2989
Faculty: Professor: Robert Damrauer
Associate Professors: Larry G. Anderson, John A. Lanning
Assistant Professor: Doris Kimbrough
Senior Instructor: Stephen Barlow, Mary Farmer

Undergraduate

**Requirements for the Major.** For graduation at the bachelor's level, students majoring in chemistry must present a minimum of 39 credits in the following courses or their equivalents: CHEM. 2031, 2032, 2061, 2068, 3111, 3118, 3411, 3418, 3421, 3498, 4121, 4128, 4511, 4521, 4528; PHYS. 2311, 2321, 2331, 2341; MATH. 1401, 2411, 2421. At least 14 hours of the required upper division chemistry coursework must be taken at CU-Denver. Students interested in the chemistry major should consult regularly with a member of the chemistry faculty. A complete description of the chemistry major's program may be obtained in the Department of Chemistry office.

**Qualifications.** Students are strongly urged to participate in the independent study or departmental honors programs.

Students planning chemistry as a career should be familiar with the recommendations of the American Chemical Society (ACS) for the professional training of chemists. Among these recommendations are two semesters of inorganic chemistry (CHEM. 3010 and 4010) and one additional semester of advanced work (see graduate chemistry offerings and 4000-level biochemistry courses). Three hours of independent study will satisfy the advanced course requirement. These additional courses lead to a bachelor's degree certified by the American Chemical Society. CU-Denver maintains an ACS chapter of student affiliates.

**Departmental Honors.** Students wishing to graduate with departmental honors in chemistry should plan to do a minimum of two semesters (6 credit hours) of research (CHEM. 4840), ordinarily starting in the junior year. A detailed description of the Honors Program in chemistry is available in the Department of Chemistry office.

**Chemistry Minor.** The objective of the chemistry minor is to provide broad introductory course work and laboratory experience to science majors without the more technical mathematical and chemical prerequisites required of the chemistry major. The chemistry minor is open to all CLAS students and should prove beneficial for science majors, pre-professional health science majors, and students seeking science education certification.

**Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.**
There are course work and grade requirements that must be satisfied to obtain a chemistry minor. Students must take a minimum of 20 semester hours of chemistry courses with a minimum of 10 upper division chemistry hours. Upper division course work must include three of the five disciplines that comprise chemistry: analytical, bio-, inorganic, organic, and physical. All chemistry minor courses must be taken for a letter grade rather than on the pass/fail grading option. A minimum 2.0 GPA in the chemistry minor courses must be earned.

To satisfy the department residency requirement, a minimum of 7 upper division hours of chemistry must be taken at CU-Denver. A complete description of the chemistry minor may be obtained in the department office.

**Graduate**

The M.S. degree is offered at CU-Denver in the following basic fields: analytical, biochemistry, inorganic, organic, or physical chemistry. Additionally, research programs involving environmental and geochemical problems are being offered.

The M.S. program is available to both full- and part-time students. The chemistry faculty at CU-Denver strive to ensure that students receive excellent advising and supervision of work. Students enrolled in the program have an opportunity to be appointed as laboratory teaching assistants. Research activities on the part of the chemistry faculty provide opportunities for graduate students to obtain research assistantships.

**REQUIREMENTS FOR ADMISSION**

Students must meet The Graduate School admission requirements. International students may have additional admission requirements concerning immigration status, proof of financial responsibility, and acceptable TOEFL scores. An undergraduate major in chemistry, including two semesters of physical chemistry, is desirable as all entering students are required to take qualifying examinations covering the major fields of chemistry. The GRE examination is suggested as is the advanced chemistry GRE examination. Failure to meet the full admission standards may lead to provisional admission.

**DEGREE REQUIREMENTS**

There are two methods of obtaining a master’s degree from the Department of Chemistry:

- **Plan I** is a research-oriented plan requiring 17 to 22 credit hours of formal course work. 4 to 9 credit hours in research courses, for a total of 26 credit hours, and the successful oral presentation of a written thesis covering the research project.

- **Plan II** is a coursework-oriented plan without a thesis requiring 32 credit hours of formal course work, 3 credit hours in research courses, and the successful oral presentation of a written report covering the research project.

Examinations. Qualifying preliminary examinations are given to all entering students in the five basic fields of chemistry. After completion of the student’s research project, a final oral examination is given to cover the thesis (Plan I) or research report (Plan II).

Prospective students are encouraged to contact the graduate advisor for additional details concerning the chemistry program, admission procedures, financial assistance, and faculty research interests.

**COURSES**

**CHEM. 1000-3. Foundations for General Chemistry.** Spring and Summer. Lect. For students with no previous chemistry or with inadequate background. This course prepares for CHEM. 2031 or 1130. Prereq. MATH. 1110 or high school equivalent.

**CHEM. 1012-5. Introduction to General Chemistry.** Fall, Lect., rec., and lab. A beginning course intended primarily for pre-nursing, physical education, physical therapy, child health associates, minerals land management, and other students wanting to fulfill curriculum or area distribution requirements. No previous knowledge of chemistry is required. Prereq. MATH. 1110 or high school equivalent.

**CHEM. 1020-5. Introduction to Organic and Biochemistry.** Spring. Lect., rec., and lab. Continuation of CHEM. 1012 with introduction to organic and biochemistry for pre-nursing, physical education, physical therapy, child health associates, and other students. Prereq. CHEM. 1012.

**CHEM. 1130-5. Engineering General Chemistry.** Fall and Spring. A one semester non-laboratory version of general chemistry for engineers and those science majors who do not require laboratory credit and do not plan to take a second semester of chemistry. Prereq. one year of high school chemistry, or CHEM. 1000 or 1012, and MATH. 1110 or high school equivalent.

**CHEM. 1332-1. Topics in Chemistry.** 5-week modules dealing with topics in chemistry. See current Schedule of Classes.

**CHEM. 1411-3. Real World Chemistry.** Lect. This is a core course offering designed to introduce the novice to the fascination of chemistry and to its methods. Emphasis on understanding patterns in chemistry, on dealing with social issues caused by chemical developments, and on historical developments will form the foundation for the course.

**CHEM. 2031-4. General Chemistry I.** Fall, Spring. Lect. A beginning course for science majors, medical technologists, premedical, and predental students. Topics include chemical structure, atomic and molecular properties, and thermodynamics. Preps students to take upper division chemistry courses. CHEM. 2038 laboratory to be taken concurrently. Prereq. one year of high school chemistry, or CHEM. 1000 and 1012 and MATH. 1110 or high school equivalent.

**CHEM. 2038-4. General Chemistry Laboratory I.** Fall, Spring. Laboratory to accompany CHEM. 2031. Students perform laboratory experiments on topics covered in CHEM. 2031 and gain experience in observing, recording, and interpreting physical and chemical phenomena. Coreq. CHEM. 2031.

**CHEM. 2061-3. General Chemistry II.** Spring, Summer. Continuation of CHEM. 2031. Topics include kinetics, equilibria, and thermodynamics. CHEM. 2068 laboratory to be taken concurrently. Prereq. CHEM. 2031.

**CHEM. 2068-2. General Chemistry Laboratory II.** Spring, Summer. Laboratory to accompany CHEM. 2061 and a continuation of CHEM. 2038. Students gain experience with laboratory technique and elementary chemical instrumentation. Prereq. CHEM. 2038. Coreq. CHEM. 2061.

**CHEM. 2300-3. Nutritional Chemistry.** Lect. A chemistry-based introductory course in nutrition intended primarily for majors in nursing, physical therapy, physical education, etc. Topics include structure and metabolism of carbohydrates, lipids, and proteins; functions of vitamins and minerals; and controversial nutritional topics and food constituents. Prereq. CHEM. 1020 or equivalent.

**CHEM. 3010-3. Applications of Modern Inorganic Chemistry.** Fall. An application of the principles learned in general chemistry. The course surveys the chemistry of the elements with an emphasis on periodic properties and applications to everyday problems. Prereq. CHEM. 2061.
CHEM. 3111-3. Analytical Chemistry. Spring. A lecture course for chemistry, biology, medical technology, and environmental students. Topics include sampling, volumetric analyses, instrumental analyses, and statistical treatment of data. Prer., CHEM. 2061.

CHEM. 3118-1. Analytical Chemistry Laboratory. Spring. A laboratory course to be taken concurrently with CHEM. 3111. Students gain experience with sampling techniques, volumetric analyses, and instrumental methods of analysis. Prer., CHEM. 2061; coreq., CHEM. 3111.

CHEM. 3411-4. Organic Chemistry I. Fall, Spring, Summer. A lecture course designed as an introduction to the study of structure, reactions, properties, and mechanisms of organic molecules. CHEM. 3418 lab. to be taken concurrently. Prer., CHEM. 2061.

CHEM. 3418-1. Organic Chemistry Laboratory I. Fall, Spring, Summer. A laboratory course to be taken concurrently with CHEM. 3411 illustrating the practical aspects of organic chemistry. Prer., CHEM. 2068; coreq., CHEM. 3411.

CHEM. 3421-4. Organic Chemistry II. Spring, Summer. A continuation of CHEM. 3411. A lecture course designed as an introduction to the study of structure, reactions, properties, and mechanisms of organic molecules. CHEM. 3428 lab. or CHEM. 3498 lab. to be taken concurrently. Prer., CHEM. 3411.

CHEM. 3428-1. Organic Chemistry Laboratory II. Spring, Summer. A laboratory course to be taken concurrently with CHEM. 3421 illustrating the practical aspects of organic chemistry. Prer., CHEM. 3418; coreq., CHEM. 3421.

CHEM. 3498-2. Honors Organic Chemistry Laboratory II. Spring. A laboratory course open to all students in CHEM. 3421 and required of chemistry majors. In small groups, students will use the chemical literature to devise multistep syntheses of isolate and identify organic compounds in natural products. Prer., CHEM. 3418; coreq., CHEM. 3421.

CHEM. 3510-4. Physical Chemistry: Biological Applications. Fall. An introduction to physical chemistry that examines the principles of thermodynamics, equilibrium solutions, and kinetics as they apply to biological systems. Calculus required to learn the principles presented in the course. Prer., CHEM. 2061, MATH. 1120, and PHYS. 2020.


CHEM. 3939-1-3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.


CHEM. 4128-2. Instrumental Analysis Laboratory. Full. Laboratory practice to accompany CHEM. 4121. Emphasis placed on writing scientific reports. Required of chemistry majors and open to other students in CHEM. 4121. Coreq., CHEM. 4121.


CHEM. 4521-3. Physical Chemistry II. Spring. Continuation of CHEM. 4511, with emphasis on chemical kinetics, quantum mechanics, molecular structure, and spectroscopy. Prer., CHEM. 4511.

CHEM. 4528-3. Physical Chemistry Laboratory. Spring. Instruction in the experimental techniques of modern physical chemistry with emphasis on the fundamental principles of thermodynamics, quantum chemistry, statistical mechanics, and chemical kinetics. For chemistry majors. Coreq., CHEM. 4521.

CHEM. 4810-3. General Biochemistry I. Fall. Topics include structure, conformation, and properties of proteins; enzymes; mechanisms and kinetics; intermediate metabolism; carbohydrates, lipids, energetics and metabolic control; and an introduction to electron transport and photosynthesis. Prer., CHEM. 3421 and BIOL. 2061.

CHEM. 4820-3. General Biochemistry II. Spring. Continuation of CHEM. 4810. Topics include macromolecules: metabolism of nucleic acids and nitrogen-containing compounds; biosynthesis and function of macromolecules including DNA, RNA, and proteins; biochemistry of subcellular systems; and special topics. Prer., CHEM. 4810.

Graduate Level

CHEM. 5010-3. Advanced Inorganic Chemistry I. Spring. Introduction to bonding in transition metal complexes, and study of selected transition metal and main group elements. Not open to students who have had CHEM. 4010. Prer., CHEM. 4521 and graduate standing.

CHEM. 5110-3. Advanced Analytical Chemistry. Advanced analytical theories and practices in electrochemistry and separation techniques. Prer., one year of analytical chemistry.

CHEM. 5120-3. Selected Topics in Spectroscopy and Automation. Topics vary from year to year with emphasis on automation using small computers, spectroscopy, and recent analytical developments. Prer., one year of analytical chemistry.

CHEM. 5140-3. Chemical Separations. A survey of the principles, methodology, and applications of analytical separations techniques to problems in the biological, environmental, and chemical sciences. Prer., CHEM. 4121.


CHEM. 5310-3. Advanced Organic Chemistry I. Survey of types of chemical bonds, resonance, hydrogen bonding, free radicals, and reactions and preparations of some of the more important types of organic compounds. Prer., CHEM. 3421 and 4511.


CHEM. 5600-3. Topics in Chemistry. Topics vary from year to year. Prer., graduate standing or consent of instructor.

CHEM. 5710-3. Air Pollution Chemistry. A discussion of air pollution problems including stratospheric pollution, global chemical cycles, air quality standards, urban pollution, acid deposition, and visibility problems. Prer., CHEM. 4521.

CHEM. 5810-3. General Biochemistry I. Fall. An introduction to biochemistry for graduate students who may or may not have had a previous course in biochemistry. Topics are similar to CHEM. 4810, but emphasis is placed on the primary and review literature as source material and on the interpretation of important experiments in biochemistry. Prer., CHEM. 3421, BIOL. 2061, and graduate standing.
The objective of this series of courses is to equip the student with a wide range of theoretical perspectives and diverse communication skills. The theoretical perspectives generally focus on face-to-face communication in interpersonal, small group, institutional, and community settings. The skills component of the emphasis seeks to equip students with flexibility in their choice of communication strategies so that they may react effectively to various situations.

The program offers two types of courses to the student: (1) theory-oriented courses which examine the rich empirical and critical literature in communication studies; and (2) performance-oriented courses designed to promote the students' confidence in their abilities to communicate effectively in many contexts.

The communication emphasis requires that students take a total of 37 hours of coursework (usually 12 courses) in communication and theatre. Ten courses (31 hours) are required. Two courses (6 hours) are chosen from a list of specified alternatives. Fifty percent of the courses for the major must be taken from CU-Denver faculty.

Students with this emphasis are particularly encouraged to enroll in internships made available through the Center for Internships and Cooperative Education. In the past, students in this program have worked with the metropolitan area's major television and radio stations, with many general distribution and specialty publications, and with corporate and governmental offices of public information.

Minor

Students also may minor in communication by taking 18 hours of courses from the communication curriculum. A list of courses for the communication minor may be obtained from the department office.

CU-Denver ESL Program

The English as a Second Language Program at CU-Denver is designed for immigrant/refugee students (most of whom are from Southeast Asia) who are literate in their first language and who need to develop further their abilities in English by improving their understanding of American culture and thought patterns. The content of the courses parallels the content of advanced foreign language classes (e.g., 3000 level) offered for credit at the University. These ESL courses are taught by instructors who have a master's degree in English as a Second Language and considerable experience in this field.

As a result, the classes are based on current linguistic theory and its practical classroom application.

Graduate

Applicants are admitted to the graduate program in communication and theatre on the basis of their academic records, recommendations, and the GRE scores. A GPA of 3.0 is normally expected. Students admitted who are unable to offer a substantial number of semester hours of work in the area of their intended specialization or in allied fields must expect that a significant number of additional courses and semester hours will be required of them in order to make up deficiencies.

The graduate communication emphasis is an integrated program between the Denver and Colorado Springs campuses. Graduate students take courses and research with faculty on both campuses.

Degree Requirements

For every student who declares intention to qualify for an advanced degree, an advisor and committee will be selected not later than the beginning of the student's second semester (or second summer term) in residence. It is the duty of this advisor and committee to assume the responsibility for approving the student's graduate program, thesis, and comprehensive final examination.

All M.A. degree candidates are required to complete CMMU 6013 or its equivalent and at least one other course in communication at the 6000 or 7000 level. At least two courses (6 to 9 hours) must be taken outside the department; these courses should be chosen in consultation with the major advisor.

Plan I Option, With Thesis. After any undergraduate deficiencies have been removed, students under Plan I must normally earn 27 semester hours of which a minimum of 16 must be earned in one major area. Students planning to pursue doctoral or professional Communication and Theatre degrees should expect to follow Plan I. At least two courses (6 to 9 hours) must be taken outside the department.

Plan II Option, Without Thesis. After any undergraduate deficiencies have been removed, students under Plan II must normally earn 36 semester hours of which a minimum of 19 must be earned in one major area. At least two additional courses (6 to 9 hours) must be taken outside the department. The student will submit at least one major paper which has been revised under faculty supervision.
Plan II is available to those who do not plan to pursue doctoral or professional degrees.

Courses at the 5000 level or above may be applied toward the graduate degree by graduate students in communication.

The graduate courses in communication and theatre are also applicable to the Master of Humanities program at CU-Denver.

For more information, students should contact the graduate advisor.

COURSES

CMMU. 1400-3. Reading for Speakers of Other Languages. This course is designed to increase the students understanding of college level texts, especially those in social sciences, which rely heavily on cultural references. Coreq. CMMU. 1410, STSK. 0806/0807.

CMMU. 1410-3. Composition for Speakers of Other Languages I. This is the first course in the ESL composition sequence. Writing will focus on development of paragraphs based on western rhetorical patterns. Grammar appropriate to the needs of the students will be incorporated. Coreq., CMMU. 1400, STSK. 0806/0807.

CMMU. 1420-3. Composition for Speakers of Other Languages II. As the second course in the ESL composition sequence, this course continues the development of paragraphs and short essays using western rhetorical modes. Writing is increasingly based on reading materials which reflect American cultural and thought patterns. Advanced grammar based on the students needs also will be incorporated.

CMMU. 1430-3. Advanced ESL Writing Skills. This final course in the ESL composition sequence emphasizes longer connected discourse. Students will write essays which reflect a synthesis of outside reading sources and a usage of idiomatic American English.

CMMU. 2021-3. Principles of Communication I. Fall, Spring. A lecture-discussion-recitation approach to communication theory and its application. Specific topics such as communication models, interpersonal communication and the concept of self, non-verbal communication, message preparation and analysis, problem solving, and decision making.

CMMU. 2031-3. Principles of Communication II. Fall, Spring. Further development of the principles of communication. Specific topics such as argumentation, source credibility, attitude, organization, language style, and mass communication will be expanded by both theoretical refinement and analysis of specific research studies.

CMMU. 2041-3. Interpersonal Communication. Fall, Spring. A lecture-recitation course focusing on the theory and development of interpersonal relationships. Issues covered include the communication process, self versus others, self esteem, person perception, the attraction process, non-verbal communication, relationship development, and family communication.


CMMU. 3011-4. Research Methods. Fall. This course examines techniques used by researchers in communication. Communication studies have used a wide diversity of approaches. These include laboratory research, field and survey research, and special techniques such as content analysis and interaction analysis. The objective of the course is to give students enough background to read critically in the social sciences.

CMMU. 3151-3. Group Dynamics. Fall, Spring. Analysis of the impact of small groups on individual behavior in social and task settings. Lecture, discussion, and guided experiences focus on the dynamics of small groups, including leadership, communication, roles, norms, goals, cohesion, etc.


CMMU. 3610-3. Radio Programming and Production. Introduction to basic elements of radio including the audio console, microphone, turntables, tape recorders, tape editing, timing, and combo operation. Emphasis on applying the basic principles and practices through professional production of live and taped radio programs.

CMMU. 3620-3. Television Production. Introduction to basic television production principles, practices, techniques, facilities, and equipment, including cameras, audio equipment, lighting, films, videotape, graphics, sets, etc. Prer., CMMU. 3610.

CMMU. 3710-3. The Film Idea. A seminar and practicum in basic public service announcement and film production. Emphasizes the opportunities in the media to get film ideas aired on TV and radio. The class will produce public service announcements and one short film in cooperation with KCNC and KUSA. Prer., junior or senior standing.

CMMU. 3939-1-3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

CMMU. 4150-3. Group Communication Theory. Observation and analysis of group processes and leadership roles and functions from the viewpoint of modern communication theory. Emphasizes both humanistic and human growth oriented theories of group communication and strict empiricist interpretations of group process. Prer., CMMU. 3151 or consent of instructor.


CMMU. 4220-3. Information Analysis. Analysis of complex systems such as organizations, with theoretic and applied information exchange and decision-making tools. Study of the applications and misapplications of the mathematical theory of communication. Prer., consent of instructor.

CMMU. 4600-3. Radio-TV Station Organization and Operation. Procedures, organization, and problems of management and operation of radio and television broadcast stations. Prer., CMMU. 3600 or consent of instructor.

CMMU. 4910-3. Topics in Communication. Special classes for faculty-directed experiences examining communication issues and problems not generally covered in the curriculum. Past topics have included communication and technology, mediation and negotiation, communication in the courtroom, and other topics.

Upper Division/Graduate Level

CMMU. 4111/5110-3: Theories of Leadership. A course examining the thought, research, and applications related to the major theories of leadership. Emphasizes a critical reading of research confirming or denying various theories, and stresses the historical development of mid-range theories of leadership behavior and characteristics. Prer., CMMU. 2021 or 3151 or consent of instructor.

CMMU. 4140/5140-3: Theories of Argumentation. Fall. Examination of theories from classical through contemporary ones. Special attention to types of proposition, burden of proof, analysis of issues, evidence, reasoning, fallacies, case construction, refutation, ethics, and forms of debate.

CMMU. 4201/5200-3: Persuasion. Fall. Examination of influence and communication at individual, group, organizational, and societal levels. A theoretic and applied analysis of persuasive techniques and strategies, with examination of public opinion, individual attitudes, beliefs, values, credibility, and certain message and audience variables. Attention is directed to the ethics and effects of persuasive appeals. Prer., CMMU. 2021.


Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.
section and retention of speech and formation of linguistic habits, set, attitude formation and change, perception, values, and meaning. Prer., CMMU 201 for majors. 

CMMU. 4230/5230-3. Nonverbal Communication. Spring. Study of nonverbal behaviors that accompany verbal communication or replace it: macrospace, proxemics, kinesics, facial expression, eye contact, gestures, vocal characteristics, touch, personal adornment. Specific attention to deception and interviewing. Current theory, research, application. 

CMMU. 4240/5240-3. Organizational Communication. Relationships between such communication factors as flow, media, density, channel, saturation, information-delivery and organization functioning, morale, and productivity. Lecture, theory, case observation, and analysis. 


CMMU. 4270/5270-3. Intercultural Communication. Fall. An examination of the philosophy, process, problems, and potentials unique to communication across cultural boundaries. Implications for personal and social innovation. Comparative study of communication behaviors in selected cultures. 

CMMU. 4280/5280-3. Communication of Directed Change. Examination of the communication process underlying the diffusion of innovations. The course provides a bridge between theory and application in the study of directed change. 

CMMU. 4650/5650-3 to 4. Television in Education. Utilization of television at all levels of education. Theory and practice in defining needs, identifying alternative solutions, producing materials, and evaluating results. Fourth credit hour requires comprehensive project design. Prer. CMMU 3600 or consent of instructor. 

Graduate Level 

CMMU. 5190-variable credit. Problems in Communication. Opportunity for students to explore, upon consultation with the instructor, areas in which the normal sequence of offerings will not allow. Prer., consent of instructor. 

CMMU. 5390-variable credit. Problems in Communication Education. Opportunity for students to explore, upon consultation with the instructor, areas in communication and theatre education. Prer., consent of instructor. 

CMMU. 5600-2. International Patterns of Broadcasting. Comparison of the philosophies, practices, and organizational structures of broadcasting throughout the world. Prer., consent of instructor. 

CMMU. 5690-2. Problems in Radio-Television and Film. Opportunity for students to explore, upon consultation with the instructor, areas in radioTV and film which the normal sequence of offering will not allow. Prer., consent of instructor. 

CMMU. 6013-3. Introduction to Graduate Work in Communication. (F. C. 6215.) Intended to familiarize students with the philosophical, ideological, and methodological bases of study in communication. Required of all departmental graduate students. 

CMMU. 6020-3. Critical Research Methods. Fall, Spring. To define and explore a variety of approaches to criticism, to explore their suitability for particular research problems, and to study problems in doing critical research. 


CMMU. 6040-3. Departmental Research Seminar. Devoted to the study, analysis, and actual instrumentation and experimentation in contemporary, on-going research projects undertaken by various faculty members. Students will actually participate in hypothesis formation, testing, and interpretation. 

CMMU. 6060-3. Management Communication Systems. The responsibilities of complex public agencies in maintaining effective communication systems, internal and external; the nature of the systems and problem areas. 

CMMU. 6150-3. Seminar: Group Methods. Critical examination of contemporary theory and research in small group behavior. Selected topics may include structure, leadership, power, conflict, decision-making, and various applications. Prer. CMMU 3511 or equivalent consent of instructor. 

CMMU. 6190-variable credit. Problems in Communication. Opportunity for students to explore, upon consultation with the instructor, areas in communication which the normal sequence of offerings will not allow. Prer., consent of instructor. 


CMMU. 6270-3. Seminar: Intercultural Communication. Examination of multidisciplinary contributions to the theory and process of intercultural communication. Development of models and the design and evaluation of programs intended to facilitate interaction across cultural boundaries. Prer., CMMU 4270/5270 or consent of instructor. 

CMMU. 6280-3. Seminar: Argumentation. A study of philosophical and rhetorical perspective on argument plus various applications of argumentative strategies — e.g., legal, political, scientific, etc. 

CMMU. 6910-1 to 4. Field Problems in Communication. Analysis, observation, and field experience involving communication problems in organizations such as service, labor, industry, military, and the like. Prer., consent of instructor. 


Independent Study 

CMMU. 4840-1-3. Independent Study (Undergraduate). Prer., written consent of supervising instructor. 

CMMU. 5840-variable credit. Independent Study (Graduate). Prer., written consent of supervising instructor. 

CMMU. 6840-variable credit. Independent Study (Graduate). Prer., written consent of supervising instructor. 

ECONOMICS 

Chair: W. James Smith 

Office: NC 3111 

Telephone: 556-4413 

Faculty: Professors: Suzanne W. Helburn, David F. Bramhall, John R. Morris, Jr., W. James Smith 

Associate Professors: Mei-Chu Hsiao, Anton D. Lowenberg 

Assistant Professors: Steven R. Beckman, Steven G. Medema 

Emeritus: Byron L. Johnson 

Economics is the science of decision making. The rigorous and general approach which characterizes economics lends itself to a remarkably wide field of practical application. Economists are noted for major contributions in a number of fields including government policy, taxation, law, regulation, political economy, international trade and finance, international and U.S. development, marketing, 

Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.
environmental studies, medical policy, portfolio management, and banking. The broad and rigorous training of economics majors accounts for their significant demand in virtually every industry and government agency. Economics provides excellent preparation for advanced graduate study as well. Recent studies indicate that economics is a preferred degree for prestigious M.B.A. programs and law schools.

Requirements for the Major. Students majoring in economics must meet the following requirements in addition to those set by the College of Liberal Arts and Sciences: at least 33, but not more than 48, semester hours in economics, of which at least 19 must be numbered 3000 or higher; ECON. 2012, 2022, 3811, 4071, 4081, and either 4810 or a computer course approved by the student's advisor (computer courses, if taken outside the Department of Economics, will not count in the student's 33 hours of economics), and either PSC. 1101 or 3022. All economics majors must take at least 15 semester credit hours of courses in the CU-Denver economics department.

For any of the five core courses (2012, 2022, 3811, 4071, 4081) for which transfer credit is sought, the department reserves the right to require students to demonstrate competence in those courses. Courses taken on the Boulder campus of the University or taken through the common pool of courses at Metropolitan State College will be considered transfer courses if the number of semester credit hours for the course are not the same as at CU-Denver and demonstration of competency may be required. As of this writing, MSC's ECON. 201, 202, and statistics have differing credit hours. Students are advised to take ECON. 4071, 4081, and 3811 as early as possible in completing their major requirements and should be aware of prerequisites for these courses. Students planning on attending graduate school are advised to take at least two semesters of calculus (MATH. 1401, 2411) and as much additional mathematics as they can. They should also take ECON. 4800. For students not planning on graduate school, MATH. 1070 is the minimum requirement.

Students who do not have an advisor should see the department chairperson for assignment to an advisor.

For all economics courses numbered above 3000, the prerequisite, unless otherwise indicated, is ECON. 2012 and 2022, or ECON. 3000.

Requirements for the Minor. Students wishing a minor in economics must take at least 17 semester hours in economics, including ECON. 2012, 2022, and either 4071, or 4081. ECON. 2012, 2022, and 4071 or 4081 must be taken from, or validated by, CU-Denver economics faculty.

Honors in Economics

Students wishing to earn departmental honors in economics must complete an economics major with a GPA of 3.75 in all upper division economics courses taken at CU-Denver, and must complete an honors thesis. The thesis prospectus must be accepted by at least one economics faculty member before enrolling for honors and there must be signed acceptance by three faculty within one month after enrolling. Students will enroll for independent study (Honors Thesis) and may take two semesters to complete the thesis. Completion will require an oral examination at the end of the thesis.

Graduate

The M.A. program in economics at CU-Denver is directed toward two groups: (1) those who look on the M.A. as a key to career development in business or government service and (2) those who desire to go on to Ph.D. studies in economics or related fields.

In serving these constituencies, the department seeks to strike a balance between generating technical competence in handling modern quantitative techniques and providing solid grounding in several applied fields of economics. Whereas these two aims overlap to some degree in the course offerings, prospective degree candidates should determine rather early in their studies at CU-Denver whether to emphasize quantitative and theoretical work or applied fields, or to balance the two.

In addition to offering regularly a graduate sequence in macroeconomic and microeconomic theory, and econometrics, the department emphasizes the following: urban economics, resource economics, environmental economics, labor economics, education of economists, political economy, mathematical economics, and international economics. Persons interested in the program should contact the graduate advisor in the Department of Economics at 556-4413.

REQUIREMENTS FOR ADMISSION

1. General requirements of The Graduate School (including a 2.75 undergraduate cumulative grade-point average).
2. Three letters of recommendation.
3. Sixteen semester hours of undergraduate economics.
4. Acceptable Graduate Record Examination scores.
5. Two official transcripts from all colleges attended.

DEGREE REQUIREMENTS

The department offers both a thesis option (Plan I) and a non-thesis option (Plan II).

Core Requirements for both Plan I and Plan II (12 credit hours):
1. Microeconomic Theory (ECON. 5073).
2. Macroeconomic Theory (ECON. 5083).
3. Econometrics (ECON. 5813).

Plan I: M.A. Thesis

1. Thesis Development Seminar (ECON. 6973, 2 credit hours).
2. Thesis (ECON. 7000, 4 credit hours).
3. 12 hours of electives, at least half of which must be at the 6000 level or above.

Plan II: Without Thesis

A total of 18 semester hours in addition to the core requirements. Two fields of concentration are required. Each field consists of a minimum of one 5000-level course and one 6000-level course (the specific courses to be approved by the faculty member in charge). Of the remaining required hours, at least half must be at the 6000 level or above. An internship can substitute for one of the fields of concentration.

COURSES

ECON. 2012-4. Principles of Economics: Macroeconomics. Purpose is to teach fundamental principles, to open the field of economics in the way most helpful to further a more detailed study of special problems, and to give those not intending to specialize in the subject an outline of the general principles of economics. Subject matter includes topics of inflation, unemployment, national income, growth and problems of the national economy, stabilization policy, plus others at the discretion of the instructor. Open to qualified freshmen. Recitation is required.

ECON. 2022-4. Principles of Economics: Microeconomics. Complementary to and normally taken following ECON. 2012. Subject topics include price determination in a market system composed of households and firms, resource allocation and efficiency of various market structures, plus others at the discretion of the instructor. Recitation is
required. ECON. 2012 is a not prerequisite for ECON. 2012.
ECON. 3160-3. Economic Issues of the 1980s. Topics in the likely development of the economy into the next decade: inflation, unemployment, environment, population, and sociopolitical interaction with economics.
ECON. 3200-3. Women and the Economy. An examination of women's roles in the economy from the perspective of traditional and radical economics. The course covers the history of women's economic roles, review of the literature, economics of household, labor force and economic consequences of women's movement.

Note: Unless otherwise specified, ECON. 2012 and 2022 are prerequisites for all the following courses.

ECON. 3800-3. Mathematics for Economists. This course will cover topics in calculus and linear algebra used extensively in economic theory. The course is designed as a primer for students entering the graduate program, but is recommended for all who are interested in obtaining a mathematical background oriented toward economic application. Prer., high school algebra.
ECON. 3811-4. Statistics with Computer Applications. [ANTH. 4150, SOC. 3121] Introduction to statistical methods and their application to quantitative problems in economics and social sciences. R ecitation is required. Prer., college algebra or equivalent, or consent of instructor.
ECON. 3939-1-3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.
ECON. 4081-3. Intermediate Macroeconomic Theory. National income and employment theory. Primary emphasis placed on determination of employment and prices. Problems of unemployment and inflation analyzed and appropriate policies considered.
ECON. 4170-3. Comparative Socialism. (PSC. 4625) Comparative analysis of public policy of governments describing themselves as socialist — as committed to abolishing social classes, ending alienation, and achieving equality and abundance, emphasis on historical conditions, political and economic organization, work incentives, education, technology, and popular culture.
ECON. 4910-3. Practicum in Economics Education. Classroom teaching of introductory-level Principles of Economics discussion sections under the supervision of an economics faculty member. Seminar analysis of problems in the teaching of introductory economics, introduction to theories of learning and instruction, demonstrations and evaluation of alternative teaching strategies and materials for use in discussion sections, and appraisal of student teaching. Prer., ECON. 4071 or 4081.

Upper Division/Graduate Level
ECON. 4050/5050-variable credit. Special Economic Problems. ECON. 4050 for majors in economics; others by consent of instructor. Designed to give students a chance to evaluate critically some practical and theoretical problems under supervision, and to present results of their thinking to fellow students and instructors for critical evaluation. Prer., for 5000 level, by consent of instructor.
ECON. 4090/5090-3. History of Economic Thought. Development of contemporary economic thought from the mercantilists through the classical, Marxist, neoclassical, institutionalist, and Keynesian traditions to the present time. Alternative approaches to scientific activity adopted and developed by the different schools of economics in the context of the economic history of the time.
ECON. 4110/5110-3. Monetary and Banking Systems. Survey of major monetary and fiscal institutions such as commercial banks, the Federal Reserve System, and savings institutions; and the structure of debt. The relationships between households and firms and financial intermediaries are explored and the tools available to macroeconomic policy makers are described and evaluated.
ECON. 4120/5120-3. Monetary Theory and Policy. An analysis of monetary models and money as a policy determinant in national and international economics. Topics include the importance of interest rates, the effectiveness of monetary and fiscal policy, examination of portfolio balance models and international models. Prer., for 4000 level, ECON. 4110; prer., for 5000 level, ECON. 5110.
ECON. 4190/5190-3. Radical Political Economy. An introduction to the Marxist world view including the dialectic, Marx's view of human nature and his theory of alienation. Course focus is Volume I of Capital and contemporary extensions of this analysis of capitalist production and capital accumulation.
ECON. 4200/5200-3. Modern Radical Political Economy. Analysis of contemporary capitalism from Marxian and other critical viewpoints. Issues will include race, gender, alienation, ecological destruction, and imperialism. Also, the problems of existing socialist societies and of building effective decentralized self-government. Prer., for 4000 level, ECON. 4190 or consent of instructor, prer., for 5000 level, ECON. 5190 or consent of instructor.
ECON. 4210/5210-3. Public Finance I: Budgeting and Expenditures. Analysis of the budgeting half of fiscal policy and making of choices regarding public expenditures at the federal, state, and local levels.
ECON. 4220/5220-3. Public Finance II: Taxation and Other Revenues. Analysis of the revenue half of fiscal policy, including sources of support for all elements of government, examining major tax sources, public debt, intergovernmental grants-in-aid, gifts, charges, and fees.
ECON. 4270/5270-3. Economics of Transportation. Survey of transportation in U.S. First part of course deals with development of intercity transportation via water, rail, highway, and air. Second part deals with the urban transportation problem, comparing private and public alternatives.
ECON. 4410/5410-3. International Trade. Theories of international trade, including classical and neoclassical trade theory, and alternatives to the neoclassical approach. Tariffs and commercial policy, international labor migration, capital movements, and multinational corporations.
ECON. 4420/5420-3. International Finance. The international adjustment process, including the foreign exchange market, balance of payments disequilibria, price and income adjustment, fiscal and monetary policy, and the international monetary system.
ECON. 4510/5510-3. Economic History of Europe. Compares the economies of Europe prior to industrial development, then traces the subsequent emergence of modern economic growth. Surveys growth and development of England, the first nation to

1Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.
industrialize; then examines the spread of industrialization to other nations. Topics include demographic change, the price revolution, development of monetary institutions, the agricultural revolution, commercial trade and colonialism, and technological change.

ECON. 4520/5520-3. Economic History of the United States. Survey of the events and circumstances which shaped the spectacular growth of the United States economy since colonial times. Examines the record and sources of growth, including changes in the labor force, capital accumulation, and technological change. Reviews development of sectors of the economy such as the financial market, agriculture, and transportation. Covers catastrophic economic events such as slavery and the Civil War, and the Great Depression, as well as evolutionary economic change, such as the emergence of the modern corporation, and of labor unions.

ECON. 4530/5530-3. Economics of Natural Resources. Looks at natural resources uses and how they have changed over time. Examines economic models of renewable resource management and models of exhaustible resource depletion. Analyzes decisions made by private firms and by government affecting the methods and rate of resource development. Examines the effects of resource development on economic growth and environmental quality.

ECON. 4555/5555-3. Energy in the U.S. Economy. Institutional structure of the energy industry; patterns of energy use; theoretical analysis of the economics of energy; recent history of the energy crisis and political debate over an energy policy for the U.S.; long-term implications for the U.S. (and world) economy.

ECON. 4600/5600-3. Introduction to Human Resources. Economics of investments in man, including the economics of poverty and the application of cost-benefit analysis to social welfare programs.

ECON. 4610/5610-3. Labor Economics. Study of problems associated with determination of wages, hours, and working conditions in the American economy. History and analysis of economic effects of trade unionism and other social institutions, including agencies of formal government; introduction to manpower studies.

ECON. 4620/5620-3. Economics of Collective Bargaining. Scientific analysis of processes by which labor and management democratically reach agreements; how differences between labor and management are settled by means of grievance procedure and arbitration; and overall economic effect of collective bargaining on goods produced by the national economy. Demonstrations, workshop, and lectures.


ECON. 4640/5640-3. Collective Bargaining, Labor Law, and Administration. Study of social pressures that are shaped into labor policy acceptable to labor, management, and the general public by various means of social control. Evolution of a common law of labor relations out of free collective bargaining and arbitration. Prereq.: for 4000 level, senior status; prereq., for 5000 level, graduate status.

ECON. 4660/5660-3. Health Economics. Presents an economic analysis of the health/medical sector of the U.S. economy. Lectures, assigned readings, and special projects are used to increase the student's awareness of issues in health care.


ECON. 4740/5740-3. Monopoly and Competition. This course involves the student in examining the structure of markets and how features such as numbers of firms and firm size can affect competitiveness and innovation in the economy. Considerable time will be spent examining the set of policies that affect the structure of markets — antitrust law.

ECON. 4760/5760-3. Government Regulation of Business. Examines the economic theory and institutional features of a wide array of regulatory topics. It will survey the current literature on models of optimal pricing and look into practices of public utility regulation, transportation regulation and deregulation, environmental and worker safety regulations, etc.

ECON. 4770/5770-3. Economic Development — Theory and Problems. Introduction to the theory and practice of economic development. Topics include development and growth models, economic planning, income distribution, human and capital resources, foreign investment and the multinational, technology transfer, trade and development. Discussions include the current issues on world debt, economic stabilization, the new protectionism, empirical studies, and country examples of development.

ECON. 4800/5800-3. Introduction to Mathematical Economics. Introduction to the use of mathematics in micro and macro economic analysis. Emphasis on model building techniques, solution methods, and economic interpretations. Prereq.: MATH 1070, 1080, or equivalent, ECON 2012, 2022, or 3900, or consent of instructor.

ECON. 4810/5810-3. Introduction to Econometrics. Introduction to econometric methods and their applications to quantitative economic problems. Simple and multiple regression models and problems encountered in their applications are developed in lectures and applied computer projects. Prereq.: ECON 3811 or equivalent.

Graduate Level

ECON. 5073-3. Microeconomic Theory I. Fundamental features of partial equilibrium theory of the firm, consumer, and market. General equilibrium and welfare economic topics will be examined. Features of the model that have empirical applications will be considered. Prereq.: ECON 4071 (or equivalent), knowledge of elementary calculus and linear algebra, or consent of instructor.

ECON. 5083-3. Macroeconomic Theory. This course will examine the major macroeconomic models within a common framework. Differences in the foundations, structure and policy implications of the competing models will be analyzed. Prereq.: ECON 4081 (or equivalent), knowledge of elementary calculus, or consent of instructor.

ECON. 6000-3. History of Economic Thought. This course fosters or advances the student's appreciation of the technical apparatus of current economic concepts and introduces students to major theoretical controversies in the development of economic analysis. In addition to secondary sources the student must read in the original texts of certain great economic writers from the Industrial Revolution to the present.


ECON. 6020-3. Macroeconomic Theory I. Considers general equilibrium and aggregative analysis in economic theory with particular emphasis given to theory of employment, consumption, and investment.

ECON. 6030-3. Microeconomic Theory II. Continuation of ECON. 6010.

ECON. 6040-3. Macroeconomic Theory II. Continuation of ECON. 6020.


Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.
efficient and optimal growth, growth and fluctuations, stabilization and control policies.

ECON. 6093-3. Critical Evaluation of Economic Theories. This course subjects the theory taught in the other courses in the program to critical scrutiny by providing an understanding and critique of the scientific method as employed in economics: analysis of the nature, strengths, and weaknesses of competing Marxism. Keynesian, comparison and critique of selected research programs generated within these traditions using methodologies from the philosophy of science. Prer., ECON. 4071, 4081; preferably ECON. 5073 and 5083.

ECON. 6100-3. The Classical and Radical Economic Traditions. Comprehensive study of classical ideas of economic progress found in writings of Smith, Ricardo, and J. S. Mill, compared with theories of economic change of Marx, Veblen, Commons, and contemporary Marxist economists.

ECON. 6110-3. Money and Central Banking. Monetary and financial institutions with focus on relationships among domestic monetary policy, interactional credit, and balance of payments.

ECON. 6120-3. Advanced Monetary Theory. Major contributions to monetary and banking theory up to the present day and current issues.

ECON. 6190-3. Seminar in Radical Political Economy. Continuation of ECON. 4190/5190. Consideration of the whole of Marx's economics as presented in the three volumes of Capital, with special emphasis on Vol. III; critical evaluation of Marx's economics; overview of alternative contemporary Marxian extensions and interpretations of Marx's analysis of capitalist development. Prer., ECON. 4190/5190 or consent of instructor.

ECON. 6210-3. Public Finance I. Taxation, public expenditures, debts, and fiscal policy. Role of public finance in terms of peace and war. National, state, and local taxation, with some special attention to the state of Colorado.

ECON. 6220-3. Fiscal Policy. Continuation of ECON. 6210. A critical analysis on fiscal policy with emphasis on problems of economic stability, growth, and employment. Either course may be taken independently for credit.

ECON. 6250-3. Urban Economics. Intensive study of urban economic issues. Particular issues will vary from time to time, but will also examine the literature and analyze the economic aspects of urban transportation, poverty, housing, urban development, and the provision of public services. Prer., ECON. 4250/5250, or consent of instructor.

ECON. 6260-3. Urban Land Economics. Critical analysis of alternatives with respect to land use in urban areas: the forces at work, the institutional arrangements, economic incentives, environmental consequences, the quality of life.

ECON. 6270-3. Urban Transportation. Problems and methodology in dealing with urban transportation. Planning models, characteristics of systems, direct and indirect costs and benefits with emphasis on Denver. Required paper on some aspects of transportation in Denver. Prer., ECON. 4270 or equivalent.

ECON. 6280-3. Housing. Evaluation of problems of housing in America. Demand and supply including structure of market, elasticities, segregation, location cost of production, and regulation. Prer., ECON. 4250 or equivalent.

ECON. 6300-2. Economics as a Social Science. The content and methods of economics are reviewed and compared with our knowledge of and methods of studying the total social system.

ECON. 6410-3. International Trade. Contemporary and classical literature on theories of international trade. Topics covered include the determination of the pattern and terms of trade, the relationship between growth and trade, and commercial policy.

ECON. 6420-3. International Finance. Topics in international finance, including exchange rate determination, the adjustment process, international financial markets, and the international monetary system.


ECON. 6510-3. Economic History. Advanced study of historical theories of economic development. Application of these theories to development of the U.S. economy, and comparison of development experiences in other nations. Specific topics may change from semester to semester, but will emphasize and critique the methodology of economic history.

ECON. 6530-3. Natural Resources Economics. Application of economic theory to physical resources such as land and renewable resources, as well as to exhaustible resources. Prer., ECON. 4071 or 4081.

ECON. 6540-3. Environmental Economics. Effects of economic growth on the environment; application of economic theory of external diseconomies, cost-benefit analysis, program budgeting and welfare economics to problems of the physical environment. Prer., consent of instructor.

ECON. 6610-3. Labor Economics. Advanced study of the history, nature, and function of labor organizations; the process of wage determination, and the formation of public policy.

ECON. 6660-3. Seminar: Human Resources. The economics of investment in human capital including the economics of poverty and the application of cost-benefit analysis to social welfare programs.

ECON. 6700-3. Seminar: Regional Economics. Theory of regional analysis, problems of regional research such as location of industry and regional resources.

ECON. 6720-3. Comparative Economic Systems. Comparative analysis of the economic systems of different countries and stages of development; interrelations with the production and distribution of wealth and with systems of property; contemporary approaches to economic planning and economic integration.

ECON. 6740-3. Comparative Industrial Organization and Planning. A study of the ways in which common decisions are made and implemented under various patterns of industrial organization, ranging from those relying on the pure-market system to those employing a high degree of centralized planning.

ECON. 6750-3. Seminar: Industrial Organization and Control. The large firm in relation to its rivals, suppliers, and customers (theory and industry studies); social control of business through antitrust and other government regulation.

ECON. 6770-3. Economic Planning and Development. Deals with role of planning in economic development with particular reference to investigation of planning problems, especially in less developed countries.

ECON. 6810-3. Intermediate Econometrics. This course emphasizes econometric theory and applications of econometric techniques and forecasting methods to quantitative problems in economics and business. The econometric model building and estimation techniques are developed in lectures and applied in students' individual research projects through the use of econometric computer programs. Prer., ECON. 4810/5810 or equivalent, or consent of instructor.


ECON. 6910-3. Practicum in Teaching College Economics. Classroom teaching of introductory-level Principles of Economics discussion sections under the supervision of an economics faculty member. Seminar analysis of problems in the teaching of introductory economics, introduction to theories of learning and instruction, demonstrations and evaluation of alternative
teaching strategies and materials for use in discussion sections, appraisal of student teaching, experience designing learning activities and evaluation instruments. Prer., ECON. 4071, 4081.

ECON. 6950-4. Master's Thesis. ECON. 6973-3 Thesis/Research Development Seminar. In this course, students complete an acceptable research or thesis proposal, identifying an adequate bibliography, and if necessary, data base for the project, and complete a draft of the literature review. Students receive intensive training in use of library references and search procedures in locating and identifying data sources. Required for all M.A. candidates completing the thesis option; recommended for others.

Independent Study

ECON. 4840-1. Independent Study (Undergraduate).
ECON. 6840-4. Independent Study (Graduate).

ENGLISH

Chair: Elihu H. Pearlman
Office: 1051 9th Street
Telephone: 556-8304

Faculty: Professors: Rex S. Burns, Robert D. Johnston, Marvin Loflin, Elihu H. Pearlman, Mary Rose Sullivan, Peter L. Thorpe

Associate Professors: Charles Beck, Richard T. Dillon, Shirley W. Johnston, Joel Salzberg, Richard P. VanDeWege, William A. West

Assistant Professors: Colleen Donnelly, Amy Levine, John S. Lofty, Bradford K. Mudge, Howard P. Movshovitz, Suzanne Schneider

Adjunct: Kenneth L. Justice

Undergraduate

An undergraduate wishing to major in English may choose one of two basic areas of emphasis: Literature or Writing. Each emphasis has its own requirements for graduation. Lists of required and suggested courses in each area of emphasis may be obtained from the English department office at 1051 9th Street.

LITERATURE MAJOR

The course of study offered by the Department of English is designed to develop a student's ability to read literature responsibly and imaginatively, to foster an understanding and appreciation of our literary inheritance, and to provide the historical perspective from which to evaluate contemporary writing. Careful study of the use of the English language also should help a student to resist the misuse and corruption of language in politics, the media, and elsewhere.

Each emphasis has its own requirements. Students who complete the program in English are expected to have mastered the ability to express their ideas in clear, succinct, and capable prose.

English majors learn to acquire and synthesize information and to present their ideas and opinions skillfully. They find employment in fields in which the sophisticated use of language is necessary for achievement and advancement. Many graduates go on to post-graduate study, not only in writing and literature, but to schools of medicine, law, education, journalism, and business.

Requirements for the Literature Major. Students majoring in English Literature must present a total of 39 hours in English (excluding ENGL. 1000, 1010, 1020, 1034, 3150, and 3170), of which 27 hours must be earned in upper division courses. None of the required 39 hours may be taken on a pass/fail basis. Only courses completed with a grade of C- or above may be counted toward the major. At least 15 upper division hours of the students work in English must be taken from CU-Denver English faculty. Students planning to major in English must consult with an advisor as soon as possible. Two courses (6 hours) are specifically required:

- ENGL. 1401. Introduction to English Studies
- ENGL. 3001. Critical Writing

Students also must choose any 6 courses (18 hours) from the following 14 electives:

1. ENGL. 3661. Shakespeare
2. ENGL. 4200. History of the English Novel
3. ENGL. 4270. History of American Literature I
4. ENGL. 4280. History of American Literature II
5. ENGL. 4300. History of the Drama in English
6. ENGL. 4320. History of Poetry in English
7. ENGL. 4500. Medieval Literature
8. ENGL. 4520. English Renaissance
9. ENGL. 4540. Restoration and 18th Century
10. ENGL. 4560. English Romanticism
11. ENGL. 4580. The Victorian Age
12. ENGL. 4290. Twentieth Century Fiction
13. ENGL. 4600. Contemporary World Literature
14. Any course in the Department of English in ethnic or women's studies.

Departmental Honors. English Literature majors interested in graduating with honors should confer with the honors advisor as soon as possible and no later than the beginning of the spring semester of the junior year.

Additional Information. Students who contemplate a career in teaching should consult with the School of Education, which supervises the teacher education program. They should plan to fulfill at least some of the college requirements during their freshman and sophomore years.

English for foreign students and courses for prospective teachers of English as a foreign language are listed under Communication in this catalog. For additional literature courses see Ethnic Studies.

Students needing information about the Literature major may call the Department of English office at 556-8304.

WRITING MAJOR

In addition to the Literature major, the English department offers the Writing major. Especially designed for future writers, this major offers a wide range of intensive writing experiences combining such areas as technical, creative, and critical writing. The student is trained in the rhetoric of the arts and humanities, the social sciences, and the natural and physical sciences.

Total units required: 120 semester hours distributed among core courses, distribution area courses, and electives.

1. Major Courses Required
ENGL. 1034. Intermediate Composition ....... 3
ENGL. 2004. Advanced Composition ......... 3
ENGL. 2154. Introduction to Creative Writing ........................................ 3

ENGL. 3001. Critical Writing ................. 3
ENGL. 3154. Technical Writing ............. 3
ENGL. 3184. Writing Topics ......... 9
English Literature courses above freshman level ................................ 9
CMMU. 2101. Speechmaking; or 3151.
Group Dynamics ............................................. 3
PHIL. 1012. Introduction to Philosophy .. 3

Total 39

2. College Core Courses for Writing Majors. Students must complete the College of Liberal Arts and Sciences Core Curriculum requirements as specified in the CU-Denver Catalog and Schedule of Classes.
MINORS IN THE DEPARTMENT OF ENGLISH

The Department of English also offers two separate minors.

**Literature Minor**

This program is designed for students who are interested and attracted to the study of English Literature but who have elected to major in another area. The recommended series of courses allows students to become acquainted with some of the methods of literary study and with a number of the most important literary works.

**Requirements:**

ENGL 1200. Introduction to Fiction, or ENGL 1300. Introduction to Poetry and Drama ........................................ 3
ENGL 3001. Critical Writing ................................ 3
ENGL 3661. Shakespeare ........................................................................ 3

Any two upper division courses, at least one of which must be on the 4000 level ........................................ 6

**Restrictions.** These requirements may not be met by independent study. All upper division courses must be taken from a member of the CU-Denver faculty. Only grades of C— or above may be counted toward the minor in literature.

**Writing Minor**

The Writing minor allows students to complement their area of major study with systematic experience in writing.

**Requirements:**

ENGL 2004. Advanced Composition ....... 3
ENGL 2154. Creative Writing ............ 3
ENGL 3154. Technical Writing, or ENGL 3170. Business Writing ............ 3
ENGL 3184. Writing Topics1 .............. 3
ENGL 4190/5190. Special Topics in Rhetoric and Writing ............ 3

**Restrictions.** ENGL 2004, 3184, and 4190 must be taken with CU-Denver faculty. Only grades of C— or better may be counted toward the minor.

**Graduate**

Students admitted to graduate study in English may complete all of their course requirements for the M.A. at CU-Denver. The Ph. D. requires study on the Boulder campus.

**REQUIREMENTS FOR ADMISSION**

Admission requirements for graduate study in English include satisfactory scores on verbal and advanced (literature) parts of the Graduate Record Examination plus at least 24 semester hours in English (exclusive of composition, creative writing and speech, and literature courses counting as credits in education). At least 16 semester hours must be in upper division work.

**DEGREE REQUIREMENTS**

Students wishing to pursue graduate work in English should note the Requirements for Advanced Degrees in this catalog. They also should obtain a copy of the brochure Master's Degree in English, issued by the English department and should consult the director of graduate English studies at CU-Denver.

To qualify for admission, the student must have a baccalaureate degree in English, and a baccalaureate in another field with a minimum of 24 semester hours in English (exclusive of creative writing, composition, or speech). At least 16 of these hours must be at the junior or senior level, and a minimum grade-point average of 3.0 is required. The Graduate Record Examination is necessary. Scores on the Aptitude part of the test should be above the 90th percentile and on the Advanced (Literature) part above the 75th percentile.

All students planning to take any graduate English examination must state their intentions to the graduate director for English studies at CU-Denver at least ten weeks prior to the date of the examination.

The graduate courses in English are also applicable to the Master of Humanities program at CU-Denver.

For more information contact the graduate director at 556-8304.

**COURSES**

**ENGL 1000. Writing Proficiency.**

ENGL 1000 is not a course per se, but a writing proficiency test which carries one credit hour toward graduation. New CLAS students (as of Spring Semester 1982) are required to meet the proficiency requirement by either passing the ENGL 1000 proficiency test or passing ENGL 1020 with a grade of C (2.0) or better.

**NOTE:** Students do not have to register for ENGL 1000 if they simply wish to take ENGL 1010 or 1020. The proficiency test is given once only in the middle of each semester. Those who pass the test will receive a grade of P in ENGL 1000. Those who fail will receive an IW in ENGL 1000 until they meet the proficiency requirement by passing ENGL 1020 with a grade of C or better, or by passing the test the next time it is offered. Once students pass 1020 or 1000 their IW will become a P.

**ENGL 1010 / 1020-3. Writing Workshop I and II.** Writing Workshop I focuses on the abilities and skills needed to write effective expository prose. This course emphasizes frequent writing, both in and out of class, with special attention to writing well-formed sentences, paragraphs, and short essays. Writing Workshop II develops student's writing of well-structured and graceful expository prose. The emphasis is on developing students' ability to write essays that describe, narrate, explain, and argue. Students are placed in ENGL 1010 or 1020 after diagnostic testing during the first week of classes to determine their writing needs.

**ENGL 1030-3. Intermediate Composition.** Emphasis on the longer essay and the research paper. Prer., ENGL 1020 or consent of instructor.

The following sequence of courses, ENGL 1101-1160, is designed to provide an introduction to the principal literary forms for students who are not planning to major in English. All students are welcome and students from colleges other than the College of Liberal Arts and Sciences are particularly invited to attend. The Department of English recommends that students enroll in the entire sequence (although each five-week module may be registered for separately).
ENGL. 1110-1. Fiction. This course begins by introducing students to the simplest fictional expressions (folk and fairy tales) and concludes with the study of contemporary short story or novel.

ENGL. 1120-1. Language. This course introduces students to the historical, physical, psychological, and intellectual aspects of both formal and colloquial language.

ENGL. 1130-1. Poetry. The course looks at a variety of poetic forms—everything from nursery rhymes to the lyrics of popular songs, from advertising slogans to formal poetry. The emphasis is on the pleasure derived from reading and hearing poetry.

ENGL. 1140-1. Drama. An introduction to the basic concerns of drama—the human need for enactment—and the value of dialogue, monologue, and gesture.

ENGL. 1150-1. Nonfiction Prose. This course explores the uses and abuses of prose. It will examine the conventions and techniques whereby the everyday use of language produces its remarkable effects.

ENGL. 1160-1. Film. This course introduces students to the art of film and its role in contemporary society. Course work will focus on specific screenplays.

ENGL. 1190-3. Special Topics. This course offers intensive study of specialized topics in English and American literature.

ENGL. 1200-3. Introduction to Fiction. Reading and analysis of short stories and novels.

ENGL. 1300-3. Introduction to Drama and Poetry. Reading and analysis of plays and poems.

ENGL. 1401-3. Introduction to Literary Studies. This course is designed for students who plan to major in English or who are seriously interested in literature. Its aim is to help students develop a sense of literary techniques and issues so they can bring an improved critical sensibility to their reading and writing. This class is the prerequisite for ENGL 3001.

ENGL. 2004-3. Advanced Composition. Reading, discussion, and writing about the ways writers use language to affect others. Focus on the power of language in such areas as politics, sexism, advertising, prejudice, and propaganda. Equal focus on developing individual student writing styles at advanced levels. Prereq., ENGL 1020 or 1034 or consent of instructor.


ENGL. 2154-3. Introduction to Creative Writing. Reading, discussing, and writing short fiction and poetry in a workshop setting.

ENGL. 2250-3. Introduction to Film. An introduction to the technical and content of films: camera work, editing, acting, sound, and theme in the films of Chaplin, Griffith, Murnau, Hitchcock, Ford, Riefenstahl, Godard, and others.

ENGL. 2300-2390-3. Topics in Literature. These courses supplement the regular program of the Department of English. Among the topics offered in recent years are American wit and humor, literary perceptions of motherhood, science fiction, opera as drama, Asian-American literature, film and art, literary classics of science, contemporary women writers. Students also may enroll for these courses at the 3000 level—see ENGL 3300-3390.

ENGL. 2400-3400-3. Introduction to Women's Studies: Survey of Feminist Thought. (HIST. 2540/3540.) A survey of the varieties of British and American feminist ideas from the French Revolution to the present, using both fiction and nonfiction texts. This course serves as an introduction to the women's studies minor.

ENGL. 2510-3. Great Books I: The Classical Heritage. This course examines some of the most influential literary works of Greece and Rome. Among the Greeks, the epics of Homer, the tragedies of Sophocles as well as the philosophical writings of Plato and Aristotle will usually receive special attention. Virgil and some of the Roman historians also will be studied. The class will usually conclude with a brief look at the writings of St. Augustine.

ENGL. 2520-3. Great Books II: The Biblical Heritage. This course introduces students to biblical literature. The various genres of writing in Hebrew (history, prophecy, wisdom literature) will be read and discussed. Also to be studied are representative sections from the New Testament, including the gospels and the writings of Paul.

ENGL. 2530-3. Great Books III: The Medieval Synthesis. This course introduces the study of European literature from Augustine to the 15th century. Among the works usually discussed are the pagan epics of England and the north, Dantes Divine Comedy, the Decameron of Boccaccio, sections of Gargantua and Pantagruel by Rabelais, and some of Chaucer's Canterbury Tales.

ENGL. 2540-3. Great Books IV: The Renaissance Explosion. In this course, students are introduced to the major literary and philosophical masterpieces of the 16th and 17th century. Among the authors usually studied are Machiavelli, Erasmus, More, Montaigne, Shakespeare, Descartes, Hobbes, and Milton.

ENGL. 2550-3. Great Books V: Experiments in Enlightenment. This course introduces the study of some of the major writings of the age of reason. Among the authors usually studied are Moliere, Locke, Swift, Pope, Beaumarchais, and Voltaire.

ENGL. 2560-3. Great Books VI: Nineteenth-Century Expansions and Explorations. In this course, students sample some of the major writings of the 19th century. Among the novelists who might be discussed are Dickens, George Eliot, Flaubert, Dostoevsky, and Tolstoi. Attention will ordinarily be paid to some of the major writers of nonfiction (Marx, Mill, Darwin, for example).

ENGL. 2570-3. Great Books VII: The Modern Western World. Three novels (one American, one English, one continental) plus representative plays and poems will be read and discussed. Among the writers who might be discussed are Joyce, Proust, Mann, Kafka, Beckett, and Pound.

ENGL. 2790-3. Survey of Ethnic Literature. (ETST. 2794.)

Note: Before taking any 3000-level course in English, a student must have earned 24 semester hours of college credit.

ENGL. 3001-3. Critical Writing. This course introduces students to literary theory and also provides extensive practice in writing about literature. This course is required for both writing and literature majors. Students majoring in literature should plan to enroll in this course during their junior year. Prereq., for literature majors, ENGL 1401.

ENGL. 3020-3. Writing Workshop: Poetry. This course is a seminar in the writing of poetry. It may be repeated for up to 6 hours credit. Prereq., ENGL 2154 or consent of instructor.

ENGL. 3050-3. Writing Workshop: Fiction. This course is a seminar in the writing of fiction. It may be repeated for up to 6 hours credit. Prereq., ENGL 2154 or consent of instructor.

ENGL. 3060-3. History of Film I. This course surveys the history of film from its beginnings until 1941 and examines how the essential techniques of film (script writing, editing, acting, laboratory work, and sound production) were mastered. Films of merit and interest by Méliès, Griffith, Chaplin, Keaton, Eisenstein, Pudovkin, Murnau, Lang, Dreyer, Flaherty, Welles, and others will be studied.

ENGL. 3070-3. History of Film II. This course surveys the history of film from 1941 to the present. The emphasis will be on the examination of films as reflections of the interests of their creators. Among the directors to be studied are Welles, Reed, Ford, Hawks, Rossellini, Kurosawa, and Bergman. Prereq., ENGL 3102 or consent of instructor.
and short reports. Prer., ENGL. 1020 or consent of instructor.

**ENGL. 3184-3. Writing Topics.** Writing topics are individual papers based on upper division courses from the arts and humanities, natural and physical sciences, and social sciences. This course is designed for writing majors only and may be repeated for up to 9 hours credit.

**ENGL. 3300-3390-3. Topics in Literature.** These courses supplement the regular program of the department. Among the topics offered in recent years are: American wit and humor, literary perceptions of motherhood, science fiction, opera as drama, Asian-American literature, film and art, literary classics of science, and contemporary women writers. Students also may enroll for these courses at the 2000 level—see ENGL. 2300-2390.

**ENGL. 3630-3. Chaucer.** A study of Chaucers major works with special emphasis upon *The Canterbury Tales.* The course will begin with a brief introduction to Middle English.

**ENGL. 3661-3. Shakespeare.** This course introduces students to some of Shakespeares major plays and poems. Among the plays usually studied are *Richard II, Romeo and Juliet, Measure for Measure, Othello, King Lear, Antony and Cleopatra,* and *The Tempest.*

**ENGL. 3680-3. Milton.** The course introduces students to some of Miltions major work of prose and poetry. Among the works usually studied are *Areopagitica, Paradise Lost, Paradise Regained, Samson Agonistes,* as well as the noblest poem in English, *Lycidas.*

**ENGL. 3939-1-3. Internship/Cooperative Education.** Internships are employment situations designed and supervised by members of the faculty: students use concepts and skills developed in the classroom in business and public service contexts. Prer., junior standing and 2.75 grade-point average. Before enrolling, students should contact the Center for Internships and Cooperative Education.

**Upper Division/Graduate Level**

**ENGL. 4050/5050-3. English Grammar.** This course examines traditional grammar as well as some more recent developments: constituent grammar, transformational grammar, role relation grammar. Other subjects which will be studied include the rules governing language use and the grammar of dialects.

**ENGL. 4060/5060-3. Semantics.** This course introduces the study of various linguistic approaches to written and oral communication. Its focus is on the various ways authors manipulate syntax and vocabulary to convey meaning.

**ENGL. 4080/5080-3. History of the English Language.** This course examines how English has changed since 800 A.D. Examples of writing from different periods will be studied. Attention will be paid to the way various groups from Norman invaders to the most recent immigrants have enriched our vocabulary and altered our syntax.

**ENGL. 4160/5160-3. Poetics.** This is an advanced poetics course for students of creative writing. Instruction is offered in the use of a variety of traditional and experimental forms.

**ENGL. 4190/5190-3. Special Topics in Rhetoric and Writing.** An examination of topics that focus on particular issues in rhetoric as they pertain both to writing (e.g., script writing, argumentative writing) and to the teaching of writing (e.g., great writing teachers, writing for teachers of writing).

**ENGL. 4200/5200-3. History of the English Novel.** The rise and development of the English novel from its beginnings in the 18th century through World War I. Among the writers usually discussed are Defoe, Fielding, Austen, Dickens, and Hardy.

**ENGL. 4230/5230-3. The American Novel.** This course concerns itself with such major developments in the American novel as the advent of realism, the novel of the frontier, the novel of the city, and other similar topics.

**ENGL. 4300/5300-3. History of the Drama in English.** This course surveys the history of drama in English from the mystery and morality plays through the flowering of the Elizabethan theater and the great comedies of the Restoration to the advent of film and television. Among the writers usually studied are the 'Wakefield master,' Marlowe, Jonson, Congreve, Sheridan, and Shaw.

**ENGL. 4320/5320-3. History of Poetry in English.** This course offers a study of the major schools and eras of English poetry, including the poetry of Great Britain and the United States, from the beginnings in the medieval period to the present.

**ENGL. 4500/5500-3. Medieval Literature.** This course introduces representative writers from the Norman Conquest to about 1550. Emphasis will be placed on the writing of Chaucer, *Guinevere and the Green Knight,* medieval drama, and Malory.

**ENGL. 4520/5520-3. English Renaissance.** This course introduces some of the important writers in the major period of English literature (1500-1660). Special attention will be paid to the works of Sidney, Spenser, Shakespeare, Bacon, Jonson, Donne, Herbert, Milton.

**ENGL. 4540/5540-3. Restoration and the 18th Century.** This course introduces some of the important writers of the "age of reason." The emphasis will be on such figures as Bunyan, Dryden, Pope, Swift, Johnson, and Burke.

---

*Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.*
ENGL. 4560/5560-3. English Romanticism. The major works of the chief English writers of the first part of the 19th century will be studied. The emphasis will be on such representative figures as Wollstonecraft, Godwin, Blake, Wordsworth, Coleridge, Hazlitt, Byron, Keats, and Shelley. ENGL. 4580 /5580-3. The Victorian Age. This course examines the main currents of Victorian thought in prose and poetry from about 1830 to the end of the century. Such writers as Carlyle, Mill, Newman, Ruskin, Browning, Tennyson, and Swinburne will usually be read.

ENGL. 4600/5600-3. Modern British and Irish Literature. This course surveys British and Irish literature from the beginning of the century up to about 1941. Among the writers usually studied are Joyce, Yeats, Eliot, Pound, Forster, and Lawrence.

ENGL. 4790/5790-3. Ethnic and Women's Literature. Designed for junior and senior high school literature teachers and other students interested in ethnic/women writers, this course explores literary contributions of writers from various ethnic groups.

ENGL. 4926/5926-3. Readings in American Literature. This course offers students the opportunity for concentrated study in areas of American literature not regularly offered.

Graduate Level

ENGL. 5000-3. Studies in Major Authors. This course offers intensive study of works of one major British or American author.

ENGL. 5010-3. Special Topics. This course offers intensive study of specialized topics in English and American literature and in rhetoric, technical writing, and the teaching of writing.

ENGL. 5093-3. Rhetoric and the Teaching of Composition. This course deals with the analysis of rhetorical theory with an emphasis on practical applications in the classroom. Attention will be paid to alternative pedagogies and to the evaluation of teaching.

ENGL. 5120-3. Technical Communication: Writing. (TC. 5405.) Prer., ENGL. 3154 or consent of instructor.

ENGL. 5130-3. Technical Communication: Editing. (TC. 5505.) Prer., ENGL. 3154 or consent of instructor.

ENGL. 5183-3. Rhetorical Theory. This course offers an examination of the principles and applications of rhetorical theory and its relationship to writing. Topics such as the following will be offered at regular intervals: rhetorical theory and the teaching of writing; and rhetorical theory and literary criticism.

ENGL. 5185-3. Rhetorical Theory for Technical Communication. (TC. 5605.) ENGL. 5400-3. Old English I. This course offers instruction in the Old English language.

ENGL. 5410-3. Old English II: Beowulf. This course offers additional training in the reading of Old English and intensive reading of Beowulf.

ENGL. 5505-3. Chaucer. This course introduces students to the study of some of Chaucer's major works. A reading knowledge of Middle English is assumed. Special attention will be paid to Troilus and Criseyde and the Canterbury Tales.

ENGL. 5510-1-3. Tutorials in American and British Studies.

ENGL. 5530-3. Milton. This course offers extensive reading in John Milton's poetry (Lycidas, Paradise Lost, Paradise Regained, Samson Agonistes) as well as in his political, social, and theological writings.

ENGL. 5913-3. Practicum in the Teaching of Composition. The practicum consists of supervised work in the teaching of composition. Students should have taken or be enrolled in ENGL. 5093, and must be appointed as teaching assistants.

ENGL. 5920-3 to 6. Directed Reading. This course offers graduate students instruction on an individual basis.

ENGL. 6000-6090-3. Studies in Major Authors. This course offers intensive study of works of one major British or American author.

ENGL. 6100-6190-3. Special Topics. This course offers intensive study of specialized topics in English and American literature and in rhetorical, technical writing, and the teaching of writing.

ENVIRONMENTAL SCIENCE, MASTER OF SCIENCE

Director: Herman Sievering
Office: NC 3208
Telephone: 556-3460

The environmental science degree is designed to provide students with a basic understanding of engineering, natural/physical sciences, and socioeconomic environmental analyses. The course requirements are: (1) enhance the interdisciplinary communication and analytical skills of the student, and (2) provide opportunities for more intensive training within a particular area of interest. Students will receive instruction in the physical and biological dynamics of various ecosystems, environmental engineering, and socioeconomic issues associated with environmental analysis.

Graduates of the environmental science program are employed in many different areas such as reviewing environmental impact statements, monitoring groundwater quality, and communicating with the public. Many students have found employment in federal agencies such as the U.S. Environmental Protection Agency. Admission requirements can be obtained upon request.

Degree Requirements

The degree curriculum consists of three components: (1) a set of five core courses required of all students (16 hours); (2) elective courses taken in the three subject areas (18 hours minimum); and (3) a research project and report (3 hours). At least 21 of the 37 credit hours required for the degree must be at the 5000 level or above. Program flexibility is provided through the selection of elective courses in various subject areas. Details concerning specific course requirements can be obtained upon request.

To fulfill the elective requirements, students select one of the following options. Each option includes courses from at least two of the three subject areas (engineering, natural/physical sciences, socioeconomic sciences).

Engineering Option: 12 hours of engineering and either 3 hours of natural/physical sciences and 3 hours of socioeconomic science or 6 hours of natural physical sciences.

Natural/Physical Sciences Option: 12 hours of natural/physical sciences and either 3 hours of engineering and 3 hours of socioeconomic science or 6 hours of engineering.

Socioeconomic Science Option: 12 hours of socioeconomic sciences and either 3 hours of engineering and 3 hours of natural/physical sciences or 6 hours of engineering.

The degree is offered through the College of Liberal Arts and Sciences with the cooperation of the College of Engineering and Applied Science. Courses offered by the School of Architecture and Planning and the Graduate School of Public Affairs also may be relevant and applicable to the program.

ETHNIC STUDIES

Director: Cecil E. Glenn
Telephone: 556-2700
Faculty: Associate Professor: Cecil E. Glenn
Instructor Attendant Rank: Danny E. Martinez

*Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.
Undergraduate  

Ethnic studies is the academic investigation of the four major minority groups in the U.S. The interdisciplinary nature of the ethnic studies curriculum program provides students the opportunity to develop a greater understanding of cultural pluralism and to acquire skills needed in professional and social service fields. The program offers a minor in ethnic studies.

Requirements for the Minor. The ethnic studies minor is designed to help students majoring in the liberal arts and sciences develop a sophisticated and broad understanding of ethnicity and its role in contemporary American society. The program features an interdisciplinary curriculum that analyzes the ethnic experience from the perspectives of the various social sciences and humanities. Further, it provides students with the theories, concepts, and generalizations needed to comprehend and interpret relations between and among ethnic groups in the U.S.

The minor in ethnic studies offers students the opportunity to enhance and broaden the body of knowledge acquired in their chosen majors, and to apply it in a variety of careers involving intercultural relations. A student who wishes to minor in ethnic studies is required to complete 21 semester hours in ethnic studies with a grade of C or better. These hours are to be taken with CU Denver faculty (any exception needs to be approved by the ethnic studies advisor). At least three of the required 21 hours must be in courses numbered 3000 or above. Courses taken to satisfy the student’s major requirements may not be applied toward the requirements for the minor in ethnic studies.

The 21 hours required must be distributed as follows: 3 hours in social perspective courses, 3 hours in cross-cultural perspective courses, 12 hours in ethnic perspective courses and ETST 4494, Cross Cultural Psychology. Interested students should obtain a list of these courses from an ethnic studies advisor.

ETHNIC STUDIES COURSES


ETST. 3034-3. Race, Gender, Law, and Public Policy. (PS. 3034.) Historical overview of race and gender relations in the U.S. and an examination of the treatment of race and gender issues in the judicial system and in public policy.

ETST. 3204-3. Law and Minorities I. Designed to acquaint students with the legal system of American society, including contracts, buying and selling, wills and inheritance, debts and creditors, landlord and tenant, family relations, criminal law, and civil rights.

ETST. 3254-3. Pathology of the Ghetto I. This dynamic course combines aspects of urban studies and sociology. Contemporary cultural factors of the minority ghetto experience will be investigated as elements in urban crisis. Emphasis is placed on possible solutions through government agencies and community organization.

ETST. 3264-3. Pathology of the Ghetto II. Continuation of ETST. 3254.

ETST. 3274-3. Culture of Poverty. A study of membership in groups that have been poor for generations and the creation of a separate culture. This course studies blacks, whites, Mexican Americans, Native Americans, and other ethnic groups that have lived in this society in a state of poverty.

ETST. 3284-3. Minorities and the Media: Images - Dominant Culture. A course of study designed to explore from an academic perspective the treatment of minorities, women, and other populations who are culturally and ethnically different with respect to stereotyping, racism, and prejudice.

ETST. 3394-3. Literature of Social Protest from an Ethnic Perspective. The literature of social protest of various ethnic groups, examined from a literary perspective and with reference to political and social theories.

ETST. 3454-3. Due Process and the Socially Disadvantaged. Structured in layman’s terms, this innovative course presents current information on occupational litigation, legal rights, due process, the future of affirmative action, and techniques of operational procedure in these areas.

ETST. 3504-3. Prejudice, Stereotyping, and American Society. An examination of prejudice and stereotyping in American society, with particular emphasis on institutions: how institutions harbor and reinforce racial and ethnic stereotyping and its impact on equal opportunity for racial and ethnic minority groups and women.

ETST. 3554-3. Minority Politics. (PS. 3554.) An examination of the social, cultural, and economic factors that affect the political choices of ethnic minorities in the United States. Analysis of minority political action.

ETST. 3704-3. Culture, Racism, and Alienation. The effects of racism on the personality of participants in racist cultures.

ETST. 4054-3. Intergroup Relations. A study of intergroup (race) relations at the small group level. Includes analysis of a group that has been stratified into a majority of white students and a fixed number of minority students.

ETST. 4124-3. Civil Rights. Designed to introduce the student to the field of civil rights and equal employment opportunities. Emphasis on Fair Employment Practices and procedures. Field visits.

ETST. 4494-3. Cross Cultural Psychology. (Same as PSY. 4495.) The influence of culture and sub-culture on personality, including sex roles, patterns of child rearing, attitudes and values, and mental illness. Pre. 6 semester hours of courses in psychology, sociology, and/or anthropology in any combination.

ETST. 4814-3. Language and Culture. This course aims at developing insights into the relationship between verbal behavior and social organization. It draws upon linguistics, anthropology and psychology to answer such questions as What is language? How did it originate and evolve? How does language vary across cultural groups and social classes?

Afro-American Studies

ETST. 1105-3. Black Contemporary Social Issues. Designed to expose the student to those areas of intellectual, social, cultural, economic, political, and educational concerns relevant to the Afro-American experience. Principally an introductory survey of primary issues currently affecting the black population.


ETST. 2745-3. The American Writer and the Black Man I. Close reading and analysis of significant literary works by black or white American writers treating black Americans; novels, poems, plays, and essays.

ETST. 2755-3. The American Writer and the Black Man II. Continuation of ETST. 2745 but may be taken independently of that course.

background and the influences of Europe and the Caribbean. Emphasis on Afro-
American folk music.

ETST. 2815-3. Afro-American Music
History and Appreciation II. Music since
1900 — religious and secular. The develop-
ment of jazz, modern rhythm, and blues
today. Black musicians and their technical
development. Continuation of ETST. 2805.

ETST. 3939-1-3. Internship/Cooperative
Education. Designed experiences involving
application of specific, relevant concepts and
skills in supervised employment situations.
Prer., junior standing and 2.75 grade-point
average.

ETST. 4345-3. Black Art and Society I. A
two-semester seminar dealing with black art
in relationship to society. The influences of
the black revolution, black culture, political
thought, and integration.

ETST. 4515-3. Black Politics. (PSC. 4514.)
Examination of black politics in the U.S.; the
role of black interest groups, structure and
functions of black political organizations,
goods and political styles of black politicians,
trends and future of black politics in the
United States.

American Indian Studies

ETST. 2496-3. Native American
Literature. An introduction to native Amer-
ican literature and other expressive forms
with emphasis on their aesthetic, linguistic,
psychological, and historical properties, as
well as the contemporary social and cultural
influences upon native authors and their
material.

ETST. 2606-3. The American Indian
Experience. Survey of the relationships
between Indian and non-Indian peoples, par-
ticularly in the context of the unique interac-
tion between tribes and the federal
government.

ETST. 3136-3. Historical Geography
of American Indians. Study of American
Indians and their culture in relationship to
the environment. Emphasis given to
individual tribes during the post-European
contact period.

ETST. 3216-3. The American Indian
and Federal Law. A survey of the special status
of American Indians, as well as the prob-
lems, costs, and benefits affecting various
tribal groups and individuals as exemplified
in a selection of actual case studies.

ETST. 3606-3. The Myths and Legends
of America. An exploration of the spec-
trum of the myths and legends of native
America which focuses on the relationship
between the collective myth and the
individual.

ETST. 3616-3. Selected Topics: Native
Americans. Examines specific topics on
Native Americans to be selected by the
instructor and students. Detailed study of
subjects related to Native American
experience and communities.

ETST. 3836-3. Seminar: American Indian
Education. Study of the historical develop-
ment of American Indian education and pro-
posed solutions to selected problems in
contemporary Indian education. Emphasis
on alternative means as viewed by American
Indians.

ETST. 3939-1-3. Internships/Cooperative
Education. Designed experiences involving
application of specific, relevant concepts and
skills in supervised employment situations.
Prer., junior standing and 2.75 grade-point
average.

ETST. 4366-3. The American Indian in
Contemporary Society. Begins with the
historical background on American Indian
accommodation and persistence, but
emphasizes the present day relations
between Indian communities and the domi-
nant society, stressing conditions and events
in Denver and the Southwest generally.

ETST. 4726-3. North American Indian
Art. (P A. 4724.) Survey of major tribal
styles of the North American continent.

Asian American Studies

ETST. 3297-3. The Asian Americans. A
sociohistorical study of the Asian American
experience. Examines anti-Asian movements
in the U.S., oppressive immigration laws, U.S.
foreign policy as it affects Asian American
groups, and image. Contemporary Asian
American immigrant communities, and
problems also will be discussed.

ETST. 3307-3. Topics on Asian
Americans. Examines specific topics on
Asian Americans to be selected by the
instructor and the students. Detailed study of
subjects related to the Asian American
experience and communities.

ETST. 3357-3. Asian American
Literature. (ENGL. 2350/3350.) The
readings in this course will look at the
experience of men and women in different
generations and examine how each group
attempted to maintain traditional values in a
foreign land, how it attempted to assimilate,
and how it forged a new identity. Readings
include short stories, poetry, essays, and
novels by leading Asian American writers.

ETST. 3417-3. Psychology of the Asian
in America. (PSY. 3415.) An introduction,
combining lecture and discussion, of the
psychological perspective of being an Asian
in America. Deals directly with aspects of
mental health, problems and approaches for
the Asian-American. Some field experience
will be included. Prer., 3 hours of
psychology.

ETST. 3567-3. Asian Pacific Women in
American Society: Dolls or Dragons?
The course will examine processes of change
in values, roles, and relations for Asian-
American/Pacific Islander women, using
contemporary and historical readings that
tackle problems such as: gendered differ-
ces, assimilation, and changing roles.

ETST. 3939-1-3. Internship/Cooperative
Education. Designed experiences involving
application of specific, relevant concepts and
skills in supervised employment situations.
Prer., junior standing and 2.75 grade-point
average.

Hispanic American Studies

ETST. 1278-3. Contemporary Mexican
American I. An introductory course in
which the basic terminology of the Chicano
milieu is defined and a survey made of the
Chicano movement from its early manifesta-
tions to the present.

ETST. 2118-3. Contemporary Mexican
Literature in Translation. Mexican
literature since World War I has been in the
forefront of literary innovations, directly
reflecting the rapid progress and changes in
society. The purpose of the course is literary
but serves also to dispel many false views of
Mexico as a rural, traditionally conservative
country.

ETST. 2128-3. Contemporary Latin
American Literature in Translation. The
approach is the same as in ETST. 2118. The
best of the contemporary Latin American
authors are studied: Borges, Fuentes, Rufio,
Carpenter, Cortazar, and others.

ETST. 2138-3. History of Chicano Art. A
survey of art, indigenous as well as that with
Spanish and Mexican influence. The focus on
the Mexican American includes the fields of
painting, sculpture, and architecture.

ETST. 3038-3. History of the Spanish
Language in the Southwest. The Spanish
of the Southwest is compared with that
spoken in other areas of the world. The
course is the first and most basic in the
linguistic series in the Spanish discipline:
Basic linguistic terminology is introduced
and applied in the analysis of Southwest
Spanish. Prer., SPAN. 2120 or equivalent.

ETST. 3048-3. Workshop in Southwest
Spanish. A research-oriented workshop
designed to conduct an in-depth analysis of
Southwest Spanish through field study. Basic
fundamentals of field research will be
introduced. Prer., ETST. 3038 or consent of
instructor.

ETST. 3108-3. Mexican American Ethnic
Relations. An interesting and innovative
mix of anthropology, history, and sociology.
Persons of Spanish, Spanish-Indian, and Mex-
ican descent will be studied. Areas of focus
will include: ethnohistorical backgrounds, cur-
rent interrelations, and social movements in
both rural and urban groups. Other topics:
cultural patterns, identity movement, and
social forms and problems of national
incorporation.

ETST. 3118-3. Mexican Literature in
Translation — Poetry. A survey of the
masterpieces of Mexican poetry in English
translations from Aztec poetry to modern
day.

ETST. 3408-3. Social Psychology and the Mexican American. Exposes students to the research on Mexican Americans in the fields of intelligence and achievement, language and learning ability, attitudes, perception, personality, and motivation.

ETST. 3838-3. History of Mexican American in Colorado. Research-oriented seminar course in which the student is expected to gather material on the subject from original sources.

ETST. 3939-1-3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

ETST. 4328-3. Education in Multilingual Communities. Sociolinguistic approach to education in multilingual communities in the United States Southwest. Topics considered will include historical and contemporary trends in schools’ language policies and practices; intraschool social and academic stratification.

ETST. 4558-3. The Mexican American in Politics. (P SC. 4554.) Analysis of the social, cultural, and economic factors which affect political behavior of Mexican Americans. Special attention will be paid to the Mexican American cultural heritage and to relations between Mexican Americans and Anglo Americans.

ETST. 4598-3. The Mexican American in the Southwest. A study of the development of the social structures of Mexican Americans in the Southwest and the forces that have affected them.

ETST. 4768-3. Contemporary Chicano Literature. (ENGL 4660.) A summary of modern Chicano authors. This course acquaints the student with the motifs and currents of the Chicano movement, whose literature is in the vanguard of American letters.

FINE ARTS
(See School of the Arts in the College of Liberal Arts and Sciences section of this catalog.)

GEOGRAPHY

Chair, Geography, Geology, and Physics: Martin M. Maltempo
Faculty Advisor: Richard E. Stevens
Office: NC 3528
Telephone: 556-3456
Faculty: Professors: Charles G. Schmidt, Richard E. Stevens

Geography Advisory Board:
Robert Alexander, Research Geographer, USGS
Rhoda Bliss, Associate, HOH Associates, Inc.
Donald Cover, Director, Office of Transit Assistance, UMTA, Department of Transportation, Denver Regional Office

Undergraduate
Geography is a science that focuses on the spatial analysis of human/physical patterns and processes. Geographers attempt to identify the factors affecting the distribution of people and their activities on the surface of the earth and to provide meaningful solutions to problems faced by societies. This discipline is an ideal major for the liberal arts student, providing exposure to the concepts and techniques utilized in investigating environmental issues, socioeconomic problems, and planning policies.

The program is designed to provide the student interested in economic, physical, or social geography with the background necessary for obtaining a rewarding career in government (federal, state, local) or private industry, as well as preparing students for graduate work.

Requirements for the Major. Students majoring in geography must complete the following basic courses or their equivalents: GEOG. 1302, 2232, 2242, 3062, and 3401 or 3411. In addition, majors must complete a minimum of 30 hours of course work in geography (at least 16 hours of which must be at the upper division level and at least 15 hours of which must be taken at CU-Denver) and maintain a 2.0 average in all geography course work completed.

Students interested in planning as a career should concentrate their geography electives in those courses cross-listed with the urban and regional planning program in the School of Architecture and Planning. Work completed as an undergraduate will reduce the time needed to obtain a master’s degree in planning. Distributed studies majors selecting geography as a primary or secondary subject should consult with the department advisor.

Requirements for the Minor. Students interested in a minor in geography should contact a departmental advisor for information and specific requirements.

Graduate
All applicants for admission to the graduate program in Geography are processed by the departmental office in Boulder and most course work must be completed on that campus. Graduate offerings on the Denver campus are minimal except for work in the general area of planning.

REQUIREMENTS FOR ADMISSION

For admission to the M.A. program, the student must have a bachelor’s degree in geography or some allied field. Applicants with little or no training in geography may be required to take additional course work in areas deemed necessary for completing graduate work. The GRE verbal and quantitative examinations, or their equivalent for foreign students, are required of all applicants.

DEGREE REQUIREMENTS

Two types of degree programs are available. Plan I requires a minimum of 18 credit hours of course work and 6 credit hours of thesis research and presentation work. Plan II requires a minimum of 30 credit hours of course work, including 4 to 6 independent student credit hours involving a complete research project or paper of publishable quality.

All incoming graduate students must complete two basic courses: GEOG. 5152-3, History and Nature of Human Geography, and GEOG. 5161-3, History and Nature of Physical Geography. A grade of less than B in either course may result in dismissal from the program or require remedial work in the area of deficiency.

These two courses are offered on the Boulder campus only. Much of the graduate work available on the Denver campus consists of courses cross-listed with other departments and schools and taught by faculty in those units, notably the School of Architecture and Planning.

For further information call the geography department, 556-3456.

COURSES

GEOG. 1102-3. World Regional Geography. An analysis of the relationships of man and the landscape based on geographic distributions in the world.

GEOG. 1302-3. Introduction to Human Geography. Systematic introduction to basic concepts and approaches in human geographic analysis.

GEOG. 1332-1. Topics in Science. A series of five-week modules on various topics in physical geography.

Sec. 1. Violent Storms.
An analysis of the causes, characteristics, and regional patterns of thunderstorms, tornadoes, and hurricanes emphasizing the hazards associated with each type of storm.
Sec. 2. Elementary Surveying.
An introduction to the various techniques of running a traverse, determination of distance by pacing, chaining, stadia, and trigonometry, and carrying of elevations.

Sec. 3. Basic Navigation.
An introduction to the principles of navigation using the sun as the celestial body. Emphasis is on determining latitude and longitude at solar noon.

Sec. 4. Earthquakes.
The characteristics, causes, and results of earth movements along faults.

Sec. 5. Waves and Beaches.
An analysis of wind-generated waves in the open ocean and the changes that occur as waves enter shallow water forming surf. The tides and seismic sea waves are discussed for comparison.

Sec. 6. Rivers and Floodplains.
An introduction to the nature of stream channels and stream landscapes with emphasis on the problems associated with man's occupation of such landscapes.

Sec. 7. World Food and Hunger.
An analysis of the world food problem with emphasis on the nutritional characteristics of major foods, the physical factors affecting food production, and the potential of the world's land for producing food.

GEOG. 2202-3. Natural Hazards.
A survey of those physical phenomena that often cause substantial damage when they occur in areas of human settlement.

GEOG. 2232-4. Climate and Humans.
A general introduction to elements of weather, physical climatology, and world regional climate classification.

GEOG. 2242-4. Landforms.
Study of earth materials, features, and processes, and how they relate to man.

GEOG. 2612-3. World Cities.
An introduction to major world urban trends, and comparative investigation of similarities and differences among specific cities around the world. The course includes a review of economic growth forces, transportation characteristics, land use patterns, housing issues, and government policy.

GEOG. 2990-3. Special Topics.
Introduction to current topics and issues in geography such as patterns of world cities, environmental management and similar issues of interest to non-majors.

GEOG. 3062-3. Map Reading and Elementary Surveying.
Introduction to the analysis and use of maps, and to elementary field techniques as research tools. Two all-day field projects.

GEOG. 3080-3. Introduction to Cartography.
Study of major elements in the preparation of thematic maps including sources of data, collection and manipulation of data, and cartographic techniques for display of data.

An analysis of the physical environment, history of settlement, and resource base of Colorado in relation to present economic patterns of the state.

GEOG. 3130-3. Central America and the Caribbean.
A survey of the physical environment and cultural development of Central America and the Caribbean islands.

GEOG. 3170-3. Africa.
A physical, cultural, and economic approach to an understanding of man/land relationships on the continent.

GEOG. 3401-3. Agriculture and Food.
An introduction to rural land use patterns and agricultural production.

An introduction to location analysis of manufacturing activities.

GEOG. 3939-1-3. Internship/Cooperative Education.
Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

GEOG. 3990-3. Special Topics.
Investigation of current topics in geography such as analysis of issues (crime, public transportation), techniques (socioeconomic impact analysis), or areas of specialization (climatology). Prerequisites vary with each topic, but will be no less than six hours in relevant social or physical science.

Systematic study of rock structures, weathering, mass wasting, fluvial, wind, glacial, and shoreline processes, and the landforms they produce. Prer., introductory college level geology or physical geography, or consent of instructor.

Upper Division
Graduate Level

GEOG. 4000/5000-3: Quantitative Techniques.
The application of statistical, quantitative, and mathematical techniques to earth science and related analysis problems.

GEOG. 4060/5060-3: Air Photo Analysis.
An in-depth treatment of the use of aerial photographs for the analysis of urban-industrial patterns, vegetation, agriculture, landforms, and geologic structure. Prer., GEOG. 3062 or consent of instructor.

GEOG. 4080/5080-3: Geographic Information Systems.
An introduction to various aspects of Geographic Information Systems including justification, definition of hardware/software, data base design, and data conversion. A Geographic Information System is a computer-based mapping system providing a graphical interface to locational and relational attribute data on facilities and land. Hands-on use of a Geographic Information System workstation is an integral part of the course.

GEOG. 4220/5220-3: Environmental Impact Assessment.
An introduction to the Environmental Impact Statement (EIS) process, its legal context, and the criteria and methods for procedural and substantive compliance. Students will develop skills appropriate to the preparation of Environmental Impact Statements and will become aware of issues fostering innovation and change.

GEOG. 4250/5260-3: Natural Resource Planning and Management.
An introduction to problems of resource preservation with special attention given to property rights and market failure, and their impacts on resource use. Planning and policy implications in reference to the optimal use of non-renewable, and the management and preservation of renewable resources, will be emphasized as will be conflicts between growth and environmental quality.

GEOG. 4400/5400-3: Regional Economic Development.
An examination of the process of economic development planning by the use of community economic development methodologies as the basis for creating regional development strategies.

GEOG. 4600/5600-3: Historical Development of Urban Form.
A description, analysis, and evaluation of the physical form of cities, from their beginnings to the present. Emphasis is on the physical planning of cities and regions in order to integrate, broaden, and challenge existing thought about cities.

GEOG. 4610/5610-3: Geography of Cities.
Detailed analysis of research efforts concerning the origin, economic growth processes, distribution, and functions of urban areas.

GEOG. 4620/5620-3: Urbanization in Developing Countries.
An overview and evaluation of urbanization and planning in the world's less developed countries for the purpose of understanding the complex cities of non-western nations.

GEOG. 4630/5630-3: Geography of Transportation.
Consideration of advanced concepts and theories leading to description and understanding of the relationships between people, products, and transportation systems over space and time.

GEOG. 4650/5650-3: Location Analysis.
The study of commercial and industrial activities, emphasizing theories of locational structure and methods of analysis.

GEOG. 4670/5670-3: Urban Transportation Planning.
A continuation of GEOG. 4630, Geography of Transportation, involving an examination of major issues of urban transportation in the United States. Included are the role of transportation

1Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.
in urban development, the urban transportation system, relationship between land use planning and transportation planning, urban transportation planning processes, and selected case studies.

**Graduate Level**


**Independent Study**

GEOG. 4840-1 to 3. Independent Study (Undergraduate). Independent research primarily for undergraduate majors. Prereq., consent of department. GEOG. 5840-1 to 3. Independent Study (Graduate). Section 1. economic; 2. physical; 3. urban; 4. social; 5. quantitative; 6. transportation. GEOG. 6840-1 to 3. Independent Study (Graduate). Independent research for graduate major students. Prereq., consent of department.

**GEOLOGY**

Chair, Geography, Geology, and Physics: Martin M. Maltempo

Associate Chair, Geology: Wesley E. LeMasurier

Office: NC 3528

Telephone: 556-3456

Faculty: Professors: Wesley E. LeMasurier, John G. Weihaupt

Associate Professor: Martin G. Lockley

Adjunct Faculty: Edward Coalson, James Jahn, Martin F. Kane, Jeffrey M. Yarus

Research Associate: Edward Erlich

Geology Advisory Board:

Art Berman, Amoco Production Company

NY. Chang, Professor of Civil Engineering, CU-Denver

Edward Coalson, Bass Enterprises

John C. Dolson, Amoco Production Company

Richard Ebens, Marathon Oil Company

Dave Eby, Champion Petroleum Co.

Paul Gagnon, Kauffman & Weinerber

Jeanne E. Harris, Natural Gas Corp. of CA.

Dan Hartmann, DJH Energy Consulting, Fredricksburg, Texas

Jim Jahn, Jahn & Wood, Inc.

Edward LaFaye, Davis Oil Company

J. E. Parker, Coastal Oil and Gas

Dave Pasta, Texaco Inc.

James Pendleton, Colorado Department of Natural Resources

Peter Price, Marathon Oil Company

John W. Rold, State Geologist and Director

Jordan Sawdo

Maureen S. Schultz

Russ Senti, Texaco Inc.

Jerry Thornburg, Conoco Inc.

David C. Underwood, President

American/Canadian Stratigraphic

Dick Walker, Bass Enterprises

Jeffrey M. Yarus

**Geology**

The study of the earth. The major topics in the field include (1) the origin and distribution of rocks and minerals, and their economic and scientific importance, (2) the processes within the earth that create continents and ocean basins, (3) the processes that act at the surface of the earth to produce hills and valleys and other landforms, and (4) the history and evolution of the earth and its living organisms. Most of these topics are subject of both scientific study and applied technology.

**Undergraduate**

The Department of Geology offers a B.A. degree program that includes a full range of courses in the fundamentals of geology, taught mainly by the full-time faculty, plus a variety of applied and topical courses taught by experts from industry. The program is enhanced by the strong industry presence in downtown Denver, and by our proximity to the Rocky Mountains. Environmental agencies, engineering geology, petroleum and mining firms, state and federal geological surveys provide employment for many of our students. The foothills of the Rocky Mountains provide a superb setting for geological field trips. Careers in geology normally require a master's degree, but a Ph.D. is required for research positions and university teaching. Many other career paths are available by combining a B.A. in geology with a degree in law, business, education, engineering, or another science. The departmental requirements for a B.A. in geology are designed to prepare students for graduate school and a professional career.

**Requirements for the Major**

Students majoring in geology may choose from among six curriculum options to suit a variety of career and educational objectives. Most options require students to take physical geology (I and II), mineralogy, petrology, paleontology, sedimentation/stratigraphy, structural geology, and field geology. Each option, however, requires a different combination of mathematics and allied science courses (physics, chemistry, and biology), and one option, with minimal mathematics and allied science requirements, is designed for students who wish to combine geology with another professional field such as law, business, or education. All courses required for the geology major must be taken for a letter grade (no pass/fail). Required upper division courses must all be C grade or better. Transfer students must take a minimum of 14 hours of the required upper division geology credits at CU-Denver. All geology majors are required to take the Graduate Record Examination (GRE) subject test in geology prior to graduation, to comply with the Colorado Commission on Higher Education mandate for comprehensive senior level assessment. The geology program at CU-Denver is offered in the evening, except for field geology and nontechnical electives.

**Requirements for the Minor**

Students interested in a minor in geology must take GEOL. 1072-1082, plus at least two of the following CU-Denver courses: GEOL. 3011, 3231, 3411, 3421, 3121. All required courses must be taken for a letter grade. No grade below C will be counted toward these requirements. Transfer students who have completed the equivalent of all these courses elsewhere must complete a minimum of two upper division courses at CU-Denver.

**Graduate**

In addition to its B.A. program, the Department of Geology participates in the M.B.S. (Master of Basic Science) and M.S.E.S. (Master of Science in Environmental Science) programs on the Denver campus, and in the M.S. and Ph.D. geology programs on the Boulder campus, through the integrated graduate program of the University-wide, four campus Graduate School.

Students with an interest in geology are invited to seek academic and career counseling with a faculty advisor. More information is available through the geology department, NC 3528, 556-3456.

**COURSES**

GEOL. 1022-3. History of Life. A nontechnical study of life forms and their relationships to environments through earth history. Includes discussion of major evolutionary events and current controversies. Recommended for CLAS science requirement.
GEOL. 1072-4, 1082-4. Physical Geology I and II. A two-semester introductory course in physical geology. The first semester (GEOL. 1072) covers surface processes and landforms. The second semester (GEOL. 1082) covers processes and properties of the earth's interior, with plate tectonics as the underlying theme. Includes three all-day field trips per semester. Prer., basic high school courses in mathematics, physics, and chemistry are advisable. Students may begin the 1072-1082 sequence with GEOL. 1082 or 1072. Partially fulfills CLAS core curriculum science requirement. The 1072-1082 sequence is required for geology majors.

GEOL. 1102-3. Dinosaurs Past and Present. A broad-based, non-technical "new look" at the world's most popular prehistoric animals. The course will stress the rapid and perennial growth of knowledge about dinosaurs and the relevance of such knowledge in the 20th century. Prer., introductory geology and/or biology recommended.

GEOL. 1202-3. Introduction to Oceanography. A survey of modern scientific knowledge of the world's oceans. Intended for non-science students, the course offers a non-quantitative introduction to the major facts and principles of physical, chemical, biological, and geological oceanography. Recommended for CLAS science requirement.

GEOL. 1302-3. Introduction to Astrogeology. A survey of the geology of the planets and their environments in space. Intended for non-majors, the course provides an introduction to the geological origin, evolution, structure, and geomorphology of the planets. Recommended for CLAS science requirement.

GEOL. 1332-1. Volcanoes. A non-technical survey of volcanoes including their geological and geographic locations, origins, history, behavior, hazards, prediction, and human impact. Recommended for CLAS science requirement.

GEOL. 3011-4. Mineralogy. Principles of mineralogy, including crystallography, crystal chemistry, and a systematic study of the more important nonsilicate and silicate minerals. Origins and occurrences of minerals. Prer., physical geology and college-level chemistry, or consent of instructor.

GEOL. 3102-3. Dinosaurs Past and Present. A broad-based, non-technical new look at the world's most popular prehistoric animals. The course will stress the rapid and perennial growth of knowledge about dinosaurs and the relevance of such knowledge in the 20th century. Prer., introductory geology and/or biology recommended.

GEOL. 3121-3. Structural Geology. Descriptive and interpretive study of the deformation structures found in sedimentary, metamorphic, and igneous rocks (i.e., folds, faults, foliation, etc.). Includes an introduction to field and laboratory studies of geologic structures, techniques of geometric analysis, and the tectonic significance of structures. Prer. GEOL. 1072-1082, MATH. 1102.

GEOL. 3200-3. Paleoclimatology. (GEOG. 3230) A descriptive and theoretical study of ancient climates on earth, and the techniques used to reveal and reconstruct ancient climates. Topics include the origin and evolution of planetary atmospheres, paleoclimatic modeling, and climatic impact on living systems, with emphasis on glacial climates in the geologic past. Prer., GEOL. 1072 or GEOG. 2232.

GEOL. 3231-4. Introductory Petrology. An introduction to classification, distribution, and origin of igneous, metamorphic, and sedimentary rocks, including their identification in hand specimens. Prer., physical geology and mineralogy.

GEOL. 3411-4. Introductory Paleontology. The study of invertebrate fossils, including a survey of the organic world and its history in the geological past. Includes biometrics and an introduction to evolution and paleoecology, and discussion of the uses of fossils in geologic correlation. Prer., introductory geology or biology.

GEOL. 3421-4. Sedimentation and Stratigraphy. An introduction to the principles of sedimentology and stratigraphy. Emphasis will be on dynamic processes within sedimentary environments and the resulting stratigraphic record. Prer., Physical Geology II, or the equivalent.

GEOL. 3939-1-3. Internship/Coeoperation Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

GEOL. 4060-3. Air Photo Analysis. (GEOG. 4060) Use of aerial photographs for the analysis of urban-industrial patterns, vegetation, agriculture, landforms, and geologic structure. Prer. GEOG. 3062 or consent of instructor.


GEOL. 4403-3. Glacial Geology and Climatology. A descriptive and theoretical study of the characteristics of glacial and glacial age features, processes and climatology. Topics include glacial geologic features, ice ages, polar exploration, geochronology, glacial stratigraphy, geopolarity chronos, glacial isostasy, eustatic change, atmospheric structure and circulation in the ice ages, paleoclimatology, paleolithic, and Holocene. Prer. GEOL. 1072 and 1082.

GEOL. 4500-3. Topics in Geology. Topics may vary from one offering to the next. Prer. vary with the topic.

GEOL. 4630-3. Principles of Geomorphology. (GEOG. 4240) Systematic study of rock structures, weathering, mass wasting, fluvial, wind, and shoreline processes, and the landforms they produce. Prer., introductory college level geology or physical geography, or consent of instructor.

GEOL. 4942-3. Mineral Resources in World Affairs. Non-technical study of the distribution, uses, and conservation of economic minerals and fuels. Topics to be discussed include the role of the Middle East in the present and future supply of fossil fuels; the potential of oil shale development in the U.S.; the potential for coal slurry pipelines; the future of nuclear power; alternate energy sources; acid rain; the potential for deep-sea mining of metallic deposits; mineral economics; the Law of the Sea; and the role of foreign governments in the mineral industry. Some special topics will be presented by industry and government experts.

Upper Division/Graduate Level

GEOL. 4090 / 5090-4: Well-log Analysis. A senior/graduate level course introducing the theory behind well-logs and their uses in stratigraphic studies. Emphasis is on determining lithology, porosity, and attitude from logs and applying this information to geologic studies. Prer., GEOL. 1082, 3421 (3121 recommended), MATH. 1121, and one year of college physics.

GEOL. 4171 / 5171-4: Optical Mineralogy. A systematic study of the optical properties of minerals and their identification in thin section and grain mounts. Prer., PHYS. 2311 and 2321, GEOG. 3011 or equivalent. Intended for advanced undergraduate geology majors or first-year graduate students. A substantial laboratory project is required for graduate credit.

GEOL. 4350 / 5350-3: Geochemistry. An introductory course in geochemistry, covering cosmochemistry, nuclear synthesis, structure and composition of the earth, the chemistry of the hydrosphere, atmosphere and biosphere, evidence for the origin of life, major chemical cycles in the ocean, isotope geochemistry and geochronology. Prer., GEOL. 1072-1082, 3011, and first-semester college chemistry. GEOL. 3231 recommended.

GEOL. 4631 / 5631-4: Introduction to Geophysical Prospecting. Basic principles of geophysical prospecting for oil and other earth resources. Seismic, magnetic, gravity,
electrical, and electromagnetic methods will be discussed. Basic college courses in physics, mathematics, and geology required.

**GEOL. 4751/5751-4: Paleoeocologic Facies Analysis.** An introduction to basic and applied paleoecology through the study of relationships between fossil assemblages and sedimentary facies. Emphasis is on the understanding of faunal association and bioclasts and the potential of paleoecological studies in the interpretation of depositional environments and biostratigraphy. Prereq., GEOL. 3411. GEOL. 3421 recommended.

**GEOL. 4770/5770-3: Statistics for Earth Sciences.** Introduction to techniques of mathematical, quantitative, and statistical analysis, with emphasis on applications to earth science problems. Prereq., algebra and introductory calculus.

**GEOL. 4830/5830-4: Computer Applications in Geology.** Principal uses of the computer in the analysis of geological data will be covered. Emphasis will be on learning to use some of the existing software commonly used by the oil industry and how to evaluate their utility. Applications to the types of geological specialties also will be covered. Prereq., GEOL. 3421 or 3121. Recommended MATH 3830 and some computer science.

**Graduate Level**

**GEOL. 5500-3. Topics in Geology.** Topics may vary from one offering to the next. Prereq., varies with the topic.

**GEOL. 5600-3. Seminar: Research and Writing in the Natural Sciences.** This senior/graduate level course deals with the nature and importance of scientific research, and traditional means by which the results are conveyed in the scientific literature. Included also are topics related to masters degree theses, doctoral degree dissertations, and the funding of scientific research. Prereq., senior or graduate level standing, with a major in a physical or biological science.

**GEOL. 5610-3. Seminar: Geophysics.** This senior/graduate level course deals with the major natural geophysical phenomena on earth and other planets, viz., seismology, gravity, geomagnetism, geothermal characteristics, telluric currents, and related phenomena. Both theoretical and the practical uses of geophysics are treated, i.e., geophysical research and exploration geophysics. Prereq., senior or graduate level standing, with a major in the natural sciences.

**GEOL. 6630-4. Sedimentary Petrology.** Study of the origin, classification, and diagenesis of sediments and sedimentary rocks. Emphasis will be on the principles of diagenesis, especially the chemical and textural aspects of diagenesis and porosity evolution. Prereq., sedimentation and stratigraphy, or the equivalent, with consent of instructor. Recommended: optical mineralogy.

---

**Independent Study**

**GEOL. 4840-1 to 3. Independent Study (Undergraduate).**

**HISTORY**

Chair: Ernest Andrade, Jr.
Office: NC 3002
Telephone: 556-1830
Facility: Professors: Frederick S. Allen, Ernest Andrade, Jr., Mark S. Foster, John S. Haller, Jr., James B. Wolf
Associate Professors: Mary S. Conroy, Thomas J. Noel, Myra L. Rich
Assistant Professor: Philip A. Hernandez
Adjunct: Ellen Fisher, G. Michael McCarthy

**History Advisory Council:**
Richard J. Ashton, City Librarian, Denver Public Library
Mary Demis Dana Crawford, Urban Neighborhoods
Glenn Cuerden, Cuerden Advertising Co.
Senator Dennis Gallagher, Colorado Legislature
Cyndi Kahn, Attorney at Law
William H. Nichols, Jr., former Mayor, City of Denver
Barbara Sudler, President, Colorado Historical Society
Kathleen Sutton, President, Historic Denver Inc.

**Undergraduate**

History constitutes an intellectual challenge not only because of its special responsibility, the search for reality in the past, but also because an understanding of history requires one to integrate many branches of knowledge. Perhaps more important to the history student than learning what has happened is understanding the process of change. By comparing the state of mankind over decades or centuries, the history student identifies fundamental social trends and analyzes critical causal factors. The history student develops research, analytical and writing skills necessary not only for work, but for living.

The bachelor’s degree in history provides preparation for immediate postgraduate career entry or advanced training in several social sciences. History majors frequently choose careers in teaching or civil service; in addition, a number develop careers in business. History is traditionally a valued background for applicants to law school and graduate schools of business administration. An attraction of the major in history is its generality, making it an excellent choice for those who are still seeking career goals.

Twelve hours of specific lower division courses and 3 hours in a senior seminar are required. In the first two academic years all majors shall take two introductory sequences: 6 hours of Western Civilization (HIST. 1011 and 1021) and 6 hours of U.S. History (HIST. 1361 and 1371). By the senior year, history majors shall be required to take a 3-hour seminar, HIST. 4981, with research paper. Also, majors must complete at least 18 upper division hours at the University of Colorado unless there is special reason to do otherwise.

**Internships.** Students may qualify for internships with the Colorado State Historical Society, Historic Denver, Museum of Natural History, the state legislature, and other agencies to earn credit and experience. Information on internships is available from the history faculty.

**Honors Program.** Students with a cumulative grade-point average of 3.2 or higher may compete for a degree in history awarded with Latin praise of cum laude, magna cum laude, and summa cum laude.

To compete, students must complete a research project, either in the senior seminar or in independent study, and pass a comprehensive examination on all their history course work. This examination will take place in the final semester of residence.

**Requirements for the Minor.** Students interested in a minor in history are required to complete 18 hours in specified course work. HIST. 1011 and 1021 (Western Civilization I and II) or HIST. 2011 and 2021 (U.S. History I and II) (6 credits) are required, but may be waived by the department with CLEP scores and after consultation with the student. Electives, at least 9 hours of which must be in upper division history courses, must be chosen with the approval of the history advisor. At least 12 credits must be completed at CU-Denver. Students must have an average of C or better in this course work to meet requirements for the minor.

**Independent Study:** Students may take up to 12 credit hours of courses in independent study (no more than 6 per semester), with permission of the instructor concerned.

*Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.*
Graduate

The history faculty of the University of Colorado at Denver offers a master's degree program which encompasses certain fields of modern history. Students applying for admission to the program should have sufficient background in history, though not necessarily a B.A. in the subject, and some knowledge of allied social sciences to afford adequate foundation for graduate work; however, the department encourages applications from individuals interested in resuming their education.

The master's degree in history is traditionally viewed as training for careers in education, government service, museum and archive management, or historic preservation activities as well as for further degree work in law and business management. But the degree program also is attractive to individuals who want to further their general education.

REQUIREMENTS FOR ADMISSION

Application forms for admission to graduate study in history are available from The Graduate School office. In addition to the general admission requirements of The Graduate School, applicants for admission to the history program must take the verbal section of the Graduate Record Examination. The Admissions Committee will examine carefully all materials submitted, including transcripts and letters of recommendation, and advise that candidates make appointments for an interview.

DEGREE REQUIREMENTS

Candidates in history must satisfy the general requirements of The Graduate School which are outlined in this catalog. In meeting the master's degree requirements of the Department of History, candidates have two options. They must complete either 30 semester hours of course work, or 24 semester hours of course work and a thesis. Under the first option, candidates must include in the thirty hours at least 15 hours of course work at the 6000 level or above and 3 hours of seminar work in their major field. The thesis (4-6 hours) counts as course work, and candidates are urged to select their thesis, which is subject to departmental approval, by the beginning of the second semester. The writing of the thesis shall be under the supervision of the candidate's major advisor. Except in special circumstances, the department strongly recommends the thesis option.

Upon nearing the completion of their degree work, all candidates are required to pass a final written comprehensive examination in their major field. The examination, to be registered for in advance, will be given each semester, including summers, at announced times and will be conducted by the department.

A residency of at least one academic year is required for the degree.

PARTICULAR REQUIREMENTS FOR THE MASTER'S DEGREE IN HISTORY

1. HIST. 6013, Historiography, is required of all graduate students.
2. Each candidate must select one of the fields listed below as a major field which shall comprise not less than 50 percent of the M.A. program:
   - The United States
   - Modern Europe, including Russia and Britain

3. Candidates must select a second field of history as their minor and complete 6-9 hours of work in that field; minor fields are: U.S. History, Modern Europe, Third World, and Public History.
4. With the consent of their major advisor, candidates may include in their program a minor consisting of work taken outside the Department of History. The minor may be chosen from the following subjects: economics, political science, psychology, sociology, anthropology, geography, philosophy, literature, art history, or education.
5. Candidates working in the area of study involving the use of a foreign language will be required by their major advisor to demonstrate proficiency in that language.
6. In history courses no grade lower than C- will count toward the completion of the course work for the master's degree.
7. Candidates may register for up to 6 hours of independent study (HIST. 6900). In special circumstances, with consent of the major advisor, candidates may register for up to 9 hours of independent study.

Additional independent study must be approved by the department chair upon the advice of the major advisor.

For further information concerning the master's degree in history at CU-Denver, direct inquiries to Chairman, Department of History, University of Colorado at Denver, 1200 Larimer Street, Denver, CO 80204 or telephone 556-4830.

COURSES

HIST. 1011-3. Western Civilization I. An introduction to ancient Mediterranean civilization and the birth of Europe. Covers topics on economics and society, political organization, intellectual history, and art from 3000 B.C. to A.D. 1500.

HIST. 1021-3. Western Civilization II. An introduction to modern European civilization and its spread over the world. Covers topics on economics and society, political organization, intellectual history, and art from A.D. 1500 to the 20th century.

HIST. 1361-3. U.S. History to 1876. This course provides an introduction to the major forces, events, and individuals that shaped the historical development of American society beginning with the European discovery of America and concluding with the Civil War, Reconstruction, and the early growth of an industrial order.

HIST. 1371-3. U.S. History Since 1876. This course provides an introduction to the major forces, events, and individuals that shaped the historical development of American society from the Civil War to the present.


HIST. 2380-3. Afro-American History I. (ETST. 2155.) Major emphasis on the events that have occurred in the life of Afro-Americans from the time of their first landing in the U.S. to the present.

HIST. 2390-3. Afro-American History II. (ETST. 2165.) Continuation of HIST. 2380.

HIST. 2540/3540-3. Introduction to Women's Studies: Survey of Feminist Thought. (ENGL. 2400/3400.) A survey of the varieties of British and American feminist ideas from the French Revolution to the present, using both fiction and nonfiction texts. This course serves as an introduction to the women's studies minor.


HIST. 2610-3. Denver. An introduction for all students to the Queen City's evolution from a mining supply town to the metropolis of the Rockies. Includes museum visits and walking tours.

HIST. 2620-3. Canada to 1867. The history of the Canadian colonies from the founding of Quebec to the establishment of the dominion in 1867. The French regime, the British conquest, the menace from the United States, and the evolution toward federation are emphasized.

HIST. 2630-3. Canada Since 1867. Canadian history from establishment of the dominion to the present. Major developments emphasized are the growth of self-government and the sense of nationhood leading to national sovereignty, and the tensions and divisions which have strained the national fabric.
HIST. 2080-3. Modern Latin America. A survey of the historical development of the modern Latin American countries beginning with the independence movements of the early 19th century and emphasizing the 20th-century issues and problems that have characterized these countries and affected their relations with the United States.

HIST. 3120-3. Europe in the Age of Total War. A general study of the evolution of Europe since 1914. Covers militarism, fascism, communism, and existentialism in the context of European history.

HIST. 3150-3. British Isles to 1714. A sampler of the rich, diverse, and dramatic history of the people of the British Isles. State formation, economic and social change, and cultural values are several of the themes threaded through this survey course.

HIST. 3160-3. British Isles Since 1714. In this course we ponder the dramatic rise of the British industrial, commercial, and political empire during the 18th and 19th centuries and its equally dramatic decline in the 20th century.

HIST. 3300-3. Southwestern Cultures. Examines history of Indian, Hispanic, and Anglo cultures in the Southwestern United States, emphasizing cultural interrelations and artistic achievements of each culture.

HIST. 3310-3. The American Southwest. An examination of the major forces and issues that have shaped the development of the modern Southwest. Emphasis will be on cultural relations, political issues, and environmental problems.

HIST. 3320-3. The American Presidency. This course explores the evolution of the American presidency from George Washington to the present. Its focus is on the personal philosophies and characters of the presidents, on the domestic and foreign affairs of their administrations, and on their campaigns and elections. Emphasis also is placed on the practice of ranking presidents to determine their relative places in history. Through analysis and constructive criticism, the presidents are separated from the mythologies that often surround them. The result is an in-depth look at both the presidential office and the men who filled it.

HIST. 3330-3. The American Colonies to 1750. The maturation of the American colonies within the British Empire, the development of the five port towns as commercial and intellectual centers, the creation of uniquely American politics, and the unfolding of critical differences between North and South.

HIST. 3510-3. Famous U.S. Trials — 19th Century. A study of the origins and early history of the American constitution with the famous trials and landmark Supreme Court decisions that affected its development through the 19th century. Also introduces students to constitutional law and legal research.

HIST. 3520-3. Famous U.S. Trials — 20th Century. Examines famous trials and landmark decisions of the Supreme Court since 1900. Also introduces students to constitutional law and legal research.

HIST. 3440-3. Women in U.S. History. An analysis of women's place in society, in the labor market, and in personal evaluation over the last 300 years.

HIST. 3451-3. Immigration and Ethnicity in American History. This course will explore the personal and collective experience of immigrants to America.

We will discuss problems of assimilation, urban and rural experiences, and implications for politics, the economy, and social attitudes.

HIST. 3550-3. The American Family. Historical perspectives about the viability of the family, its responses to social and economic change, and the role of its members.

HIST. 3610-3. Southwestern Cultures. Examines history of Indian, Hispanic, and Anglo cultures in the Southwestern United States, emphasizing cultural interrelations and artistic achievements of each culture.

HIST. 3620-3. The American Southwest. An examination of the major forces and issues that have shaped the development of the modern Southwest. Emphasis will be on cultural relations, political issues, and environmental problems.

HIST. 3780-3. Introduction to African History. By looking at specific examples of the cultural, political, and economic experience of African society, this course will attempt to introduce and make comprehensive the diverse history of the people of Africa.

HIST. 3790-3. African History by Novels. An introduction to modern Africa through the eyes of creative writers. Various topics, such as childhood, religion, colonialism, are presented from two points of view — the African and the non-African.

HIST. 3830-3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

HIST. 4350-3. Genocide and Holocaust. An examination of the Nazi decimation of the Jewish people during the Second World War.

HIST. 4750-3. Japan in the Modern Age. Course of Japanese history since the Perry expedition. Covers Japanese westernization and industrialization, the expansion of empire and defeat in World War II, the occupation, and the amazing technological and social transformation since the occupation years.

HIST. 4981-3. History Seminar. This course is required for undergraduate history majors and is generally taken in or near the senior year. It covers use of documentary sources and historical criticism, with students utilizing these skills in an historical research paper.

Upper Division/Graduate Level

HIST. 4030 / 5030-3. Early Modern European Intellectual History. This course will focus on the enlightenment and examine the ideas of Montesquieu, Voltaire, Diderot, Rousseau, Adam Smith, and Condorcet.

HIST. 4040 / 5040-3. Modern European Intellectual History. This course will examine the ideas of Marx, Darwin, Freud, and others in the making of the modern European mind.

HIST. 4090 / 5090-3. Medieval Europe. This course will survey the general history of Europe from the fall of Rome to the opening of modern Europe.

HIST. 4130 / 5130-3. European Diplomatic History in the 20th Century. This course will examine the European state system and its many crises since 1890.

HIST. 4170 / 5170-3. Victorian England. England during the 19th century was at its zenith as an economic and imperial power. This course explores the basis of British power and the political and social tensions that were created by it.

HIST. 4180 / 5180-3. Twentieth Century England. The 20th century has been an era of retrenchment of England. This course examines the consequences of that decline on the political and social institutions in Great Britain.


HIST. 4200 / 5200-3. History of Ireland. Ireland's unique history and character is examined from the beginning of the Christian era to the present conflicts in northern Ireland, with emphasis on the 19th and 20th centuries. Some of the topics covered are the distinctive cultural development, the troublesome relationship with England, and the significance and role of the church.

HIST. 4230 / 5230-3. French Revolution and Napoleon. The course will analyze the revolutionary movement in France and Europe from the 1780s to the 1820s.

HIST. 4250 / 5250-3. Germany in the 20th Century. This course will analyze the German problem in modern Europe and seeks to answer the reasons why Germany adopted a policy of reckless imperialism abroad and succumbed to a nasty variety of fascism at home.

HIST. 4300 / 5300-3. Early Russia to 1700. Covers prehistoric Russia, the richness of the Kievan period, icons, architecture, internationalism of Kiev, Mongol society, its influence on Russia, rise of Moscow and its dominance over other contender s for rule; autocracy, serfdom, and the ecclesiastical schism.

HIST. 4310 / 5310-3. The Emergence of Modern Russia: 1700-1856. The development of imperial political institutions, church-state relations, class stratification, scientific, educational, and cultural developments in 17th, 18th, and early 19th-century Russia.

HIST. 4320 / 5320-3. Reform and Revolution in Russia: the 1860s to 1917. Emphasis upon Russia's attempts to modernize, beginning with great reforms of the 1860s and 1870s, increasing polarization.

*Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.*
of government and opposition groups. Examines governmental point of view through several monographs and revolutionary theory, including thought of Marx, Engels, Lenin, and Trotsky.

**HIST. 4330 / 5330-3:** Soviet Russia Since 1917. Studies the development of the Soviet Union from its formation in the October Revolution, through the civil war, the New Economic Policy, industrialization, collectivization, the Stalinist purges, up to the present.

**HIST. 4340 / 5340-3:** Russian Intellectual and Cultural History. Students will study Russian art and architecture through the 19th and early 20th centuries, read great literary works, and finally, analyze the Russian music of this period.

**HIST. 4370 / 5370-3:** The American Revolution. The crisis of the British Empire in North America from the end of the French and Indian War to the ratification of the American constitution. Topics include the emerging economy, constitutional arguments against Britain, the conduct of the war and the definition of a republic.

**HIST. 4380 / 5380-3:** Early National America, 1789-1840. This survey of the 51 years following the inauguration of Washington considers the establishment of the new government, the roles of the president and the Supreme Court, westward expansion and its effects on American economic and political life, and the War of 1812.

**HIST. 4390 / 5390-3:** U.S. Civil War and Reunion. Begins with the causes and outbreak of the American Civil War, describes the military conflict and the social aspects of the war and examines the federal efforts to reconstruct the southern states and protect the rights of black citizens after 1865.

**HIST. 4400 / 5400-3:** The Gilded Age: U.S. History, 1865-1900. Topical study of evolution and growth of major American institutions. Among the more important topics are the rise of big business, impact of industrialism, immigration, the rise of the city, the plight of the native Americans, the West, agrarian discontent, and foreign policy.

**HIST. 4410 / 5410-3:** Progressivism, Depression, and War: U.S. History, 1900-1945. *Fall.* A topical study of changes in American institutions, including attempts to control the corporate giants, growth of labor organization, World War I and reaction, rise of consumerism in 1920s, causes of the crash of 1929, the Depression, the New Deal and its critics, and the U.S. in World War II.

**HIST. 4420 / 5420-3:** Affluence and Anxiety: The U.S. Since 1945. *Spring.* An examination of the major developments with special emphasis on the following topics: the onset of the Cold War, growth of unparalleled prosperity, problems of world leadership, the civil rights movement, division over Vietnam, economic uncertainties of the 1970s, and the Reagan era.

**HIST. 4440 / 5440-3:** U.S. Foreign Policy Since 1912. The main thrust is the emergence of the U.S. from isolation toward full-scale participation in the affairs of Europe and other areas. Special attention is given to U.S. intervention in two world wars, the Cold War, and the overextension of U.S. commitments since 1960.

**HIST. 4450 / 5450-3:** Canada and the United States. A survey of U.S.-Canadian relations from colonial times to the present. Major themes include the American invasions of Canada, Canadian fears which led to the creation of the Dominion in 1867, boundary and other problems, growth of American cultural-economic domination, and strategic military integration of the two countries since World War II.

**HIST. 4460 / 5460-3:** U.S. in the Pacific. Explores some well-known, other little-known facets of American interest and influence in the Pacific. Major topics include development of trade; the growth of the U.S. as a Far Eastern power; evolution of our colonial empire; causes, course, and effects of World War II in the Pacific.

**HIST. 4470 / 5470-3:** U.S. Society and Thought to 1860. Major topics include the evolution of Protestantism form Puritans to Transcendentalists; humanitarian reforms such as abolition, temperance, and women's rights. European influences on American thought, the effect of industrialization on the development of class society, and American nostalgia for agrarian life.

**HIST. 4480 / 5480-3:** U.S. History Since 1900. This course is not a history of America's wars but is concerned more with the development of military policy. It thus focuses as much upon peacetime as it does on wars, especially emphasizing the reasons for peacetime policy and how the peacetime military structure affected wartime performance. The role of technology of warfare also is emphasized.

**HIST. 4500 / 5500-3:** U.S. Military History Since 1900. This course is not a history of America's wars but is concerned more with the development of military policy. It thus focuses as much upon peacetime as it does on wars, especially emphasizing the reasons for peacetime policy and how the peacetime military structure affected wartime performance. The role of technology of warfare also is emphasized.

**HIST. 4570 / 5570-3:** Urban America: Colonial Times to the Present. Rise of the American city from colonial time to present. Major emphasis on the process of urbanization since 1840: town promotion, the industrial city, immigration, boss politics and reform, urban technology, transportation systems, minorities, city planning, and the future of urban America.

**HIST. 4580 / 5580-3:** U.S. Business History. A survey of the major changes in business practices from colonial times to the present. Primary emphasis will be placed on the industrial revolution and after.

**HIST. 4660 / 5660-3:** Colorado Historic Places. An introduction to community architecture and history for all students. You will learn how to survey, describe, and designate significant architectural and historic structures—prehistoric, historic, and contemporary.

**HIST. 4664 / 5664-3:** Historic Conservation and Preservation. An introduction for all students to the history, methodology, and goals of historic preservation.

**HIST. 4650 / 5650-3:** History in Museums. This course is designed to teach students about preserving, studying, interpreting, assembling, and exhibiting artifacts for instruction and enjoyment. There will be numerous on-site visits to a variety of museums. Through projects, students will actually participate in aspects of museum work.

**HIST. 4730 / 5730-3:** China Since 1850. A survey of Chinese history in the modern era. Includes examination of western domination of China, revolution, and internal fragmentation of China, Japanese attacks and World War II, and civil war and the Communist revolution.

**HIST. 4770 / 5770-3:** The Indo-China War. Covers the conflict in Vietnam with roots in the period prior to World War II. Main topics include the rise of nationalism in French Indochina, the war against the French, the northern moves to unify Vietnam, American intervention, and eventual victory of the northern regime.

**HIST. 4780 / 5780-3:** Southern Africa. A history in depth of the clash of peoples and cultures in Africa south of the Zambesi River. African and Afrikaner political, economic, and cultural development in a single land and the consequences of several competing nationalisms existing side by side will be examined. Apartheid and African opposition to it will be analyzed.

**HIST. 4800 / 5800-3:** African Struggle for Independence. An assessment of its leadership from the Colonial era to today's Africa.

**HIST. 4820 / 5820-3:** The Modern Middle East.

**HIST. 4830 / 5830-3:** The Second World War. The war in its totality: causes, military strategies (equal treatment to European and Pacific theaters), campaigns, impact of technology and weapons, political and social upheaval.

**HIST. 4840 / 4900-1-3:** Independent Study (Undergraduate).

**Graduate Level**

**HIST. 6013-3:** Historiography.

**HIST. 6840:** Variable credit. Independent Study.

**HIST. 6920-3:** Readings in European History.

**HIST. 6921-3:** Readings in British History.

*Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.*
HIST. 6922·3. Readings in French History.
HIST. 6923·3. Readings in German History.
HIST. 6924·3. Readings in Russian History.
HIST. 6927·3. Readings in Public History.
HIST. 6928·3. Readings in Third World History.
HIST. 6929·3. Readings: Special Subjects.
HIST. 6980·3. Seminar in European History.
HIST. 6981·3. Seminar in British History.
HIST. 6982·3. Seminar in French History.
HIST. 6983·3. Seminar in German History.
HIST. 6984·3. Seminar in Russian History.
HIST. 6987·3. Seminar in Public History.
HIST. 6989·3. Seminar: Special Subjects.

HUMANITIES, HONORS IN

Director: Shirley White Johnston
Office: AR 275
Telephone: 556-2305

The Honors in Humanities Program (HHP) is a co-curricular program for undergraduate students majoring in any field. Business, engineering, education, sciences, health sciences, and social science majors will find the program attractive; it is also open to students majoring in disciplines within the humanities. Honors in Humanities aims to broaden and deepen the undergraduate educational experience in a coherently designed interdisciplinary curriculum that explores the relationships among many areas of study, including the fine arts, history, language and literature, music, philosophy, political science, theatre, and even modern biology and physics. Students in the program proceed through an introductory, intermediate, and advanced level of study in the humanities and develop advanced writing skills. The program leads to graduation with Honors in Humanities for students who, in addition to the work in their major fields, successfully complete the requirements of the program with a 3.0 grade-point average or better.

To be admitted to the Honors in Humanities program students must be currently enrolled at CU-Denver and be in good standing. Interested students should arrange for an interview with the HHP director.

The Curriculum

Students in the program must complete 21 semester hours, distributed as follows:
- HUM. 1012 (3 hours); Course Clusters, subject-oriented courses arranged each semester around specific themes or subjects appropriate to humanistic approaches (12 hours, also applicable to the socio-humanistic electives and to CLAS core curriculum requirements); ENGL. 3001 (3 hours); and HUM. 4000 (3 hours).

COURSES

HUM. 1012·3. The Humanistic Tradition: Modes of Expression. Constitutes the introduction to the program. The course is team-taught by faculty from three different disciplines, and attempts to familiarize students with humanistic modes of expression through the study of history, literature, philosophy, music, and the visual and dramatic arts.

HUM. 4000·3. Senior Seminars. Constitutes the capstone to the program. The course is team-taught by faculty from two different disciplines. It has a thematic focus, which varies with different faculty teams. Sample course themes are Vienna at the Turn of the Century; The Romantic Movement, and Utopias and Dystopias. The Senior Seminar requires students to do projects that integrate thought and approaches from several fields of study.

HUM. 4840·1-3. Independent Study.
ENGL. 3001·3. Critical Writing. Aims to provide mastery of the skills of expression, articulation, and critical evaluation of works of literature. It is an essential ingredient of the program, in which students prove their capacity for writing effectively and analytically.

Two "course clusters" (i.e., several courses clustered around a topic) are offered each fall and spring semester. Students in the Honors in Humanities program, in a given semester, enroll for at least two courses in a single cluster, thereby engaging in interdisciplinary study, examining a given subject from two different perspectives at the same time. Students who do not plan to take the full honors program but who want to experience interdisciplinary study are also invited to enroll in two or more courses in a given cluster.

HUMANITIES, MASTER OF

Director: M. Kent Casper
Office: AR 275
Telephone: 556-2305

The Master of Humanities is an interdisciplinary degree offered at CU-Denver. Its purpose is to provide an opportunity for students to broaden their understanding of the relationships among the several areas normally included under the heading of humanities, e.g., communication, philosophy, the arts, literature, and the languages. The Master of Humanities offers all students the opportunity for an individualized self-enrichment program at the graduate level, and a chance to combine their unique abilities and interests in the pursuit of a degree which will provide lifelong satisfaction.

The Master of Humanities also has a special program option, the Cultural Administration Concentration. This includes specially targeted humanities courses as well as courses in marketing, accounting, and management plus an arts administration seminar and an internship with a local arts institution. Interested students should contact the M.H. office for further information.

All courses required for the M.H. degree are offered at CU-Denver.

Requirements for Admission

The initial step in applying to the Master of Humanities program is for all applicants to arrange for an interview with the M.H. director.

Before entering the M.H. program, a student is expected to have completed at least 40 semester hours in the humanities, broadly conceived to include general studies in such areas as communication, theatre, philosophy, literature, the arts, the languages, and other areas as agreed upon by the student and the program director.

Students are required to take the Graduate Record Examination or Miller Analogy Test.

General requirements of The Graduate School governing acceptance to a master's degree program are in effect, including the requirement of a 2.75 undergraduate grade-point average.

Degree Requirements

All courses credited toward the M.H. degree must be taken at the University of Colorado over a period not exceeding five years or six successive summers. Each
student’s program is supervised by an advisory committee consisting of two or three members of the graduate faculty, each from a different area of the humanities.

In addition to the 3 hours for HUM. 5003, 3 hours for HUM. 5503, and 2 hours for HUM. 5994 (all required courses that are described below), candidates for the M.H. degree are expected to complete a minimum of 24 semester hours at the 5000 level or higher in at least two (maximum 3) of the following areas:

- Communication and theatre
- English
- Fine arts
- French language and literature
- History
- Music
- Philosophy
- Spanish language and literature

Study in areas other than those listed above may be accepted as agreed upon by the student and the advisory committee. Courses should be chosen on the basis of their potential for interdisciplinary integration toward a central focus.

Within one calendar year of entering the M.H. program, the student is required to take HUM. 5003 (may be repeated as HUM. 5010). After at least 12 hours in the program, HUM. 5503 is required. Finally, HUM. 5994 is a required culminating course that is designed to explore directions and provide momentum for the thesis work. All required courses count as part of the 32 hours preceding the thesis work.

For the Cultural Administration Concentration, the required core humanities courses apply, with these changes: only 18 hours are elective, 6 hours are required for final seminar and internships, and an additional 9 hours are required in business or public administration credits.

Before completing 15 hours of course work toward the M.H., the student must meet with an advisory committee to plan the directions and emphases for the remainder of studies for the degree.

After completing the 32 hours required for the degree, the student is required to present a final thesis or project.

Students sign up for a minimum of 4 thesis or thesis project hours. This is a substantial scholarly and/or creative exercise involving at least two different humanistic areas. It is supervised by the student’s advisory committee and must be performed or presented before an open seminar consisting of the committee and any other faculty members who wish to attend. The approved thesis or report of thesis-performance shall be recorded in The Graduate School.

Throughout this work toward the M.H. degree, students must uphold the high standards of The Graduate School, maintaining at least a B average in all courses taken subsequent to their admission to the M.H. program.

**Required Courses**

Courses specifically required for the M.H. degree are HUM. 5003, 5503, and 5924.

The 24 hours (in addition to the required courses) required for the degree will normally be drawn from the 5000-level courses which already exist at CU-Denver.

For further information about the Master of Humanities degree program students should contact 556-2305.

**COURSES**

**HUM. 5003-3. Introduction to Interdisciplinary Graduate Studies.** A one-semester seminar which investigates the definition of the humanities, their place in the life of man, the various media through which they manifest themselves, and related matters. Required of all Master of Humanities degree candidates; open to other qualified graduate and undergraduate students with consent of instructor. (May be repeated as 5010.)

**HUM. 5503-3. Mid-Program Seminar.** The seminar explores a specific interdisciplinary topic, involving students in independent research, problem solving, and presentation. Required of all MH students who have completed at least 12 hours of graduate work. Open to non-MH graduate students with consent of instructor. (May be repeated as 5010.)

**HUM. 5840-variable credit. Independent study.**

**HUM. 5924-2. Directed Readings in Interdisciplinary Humanities.** Capstone course of the M.H. program, concentrating on the student’s interdisciplinary focus that will form the topic of comprehensive exam and/or thesis project. Involves work with two-member faculty advisory committee. Required of all M.H. students after 30 hours of graduate work.

**HUM. 5984-3. Topics in Interdisciplinary Humanities.**

**MATHEMATICS**

**Chair:** J. Richard Lundgren  
**Office:** DR 540  
**Telephone:** 556-8442  
**Faculty:** Professors: Bennett Fox, Harvey J. Greenberg, Collin J. Hightower, J. Richard Lundgren, Thomas A. Manteuffel, Stephen F. McCormick, Stanley E. Payne, Roland A. Sweet

**Concurrent:** Fred Glover  
**Associate Professors:** William L. Briggs, Roxanne M. Byrne, Zenas R. Hartvigson, Kathryn Jones, William Juraseck, Sylvia Lu, Jan Mandel, Thomas F. Russell, Ramalingam Shanmugam, Burton Simon

**Assistant Professors:** William E. Cheronitzo, David Fisher, Weldon A. Lodwick, Jennifer Ryan

**Adjunct:** James Cavender, John W. Ruge

**Mathematics Advisory Committee:**  
Ed Collins, Englewood High School  
Tony Cox, US WEST  
Vicki Greff, Storage Technology  
Jim Hertzl, Digital Equipment Corp.  
Fred Joines, U.S. Geological Survey  
Lynn Leader, Digital Equipment Corp.  
Mohsen Pazirandeh, Advanced System Technologies, Inc.  
Roger Ross, Data Management  
Deane Shank, Marathon Oil Exploration & Production Tech.  
John Walton, Manual High School  
Lois Walton, Hughes Aircraft

At CU-Denver, the student has the opportunity to investigate both the theoretical and applied aspects of mathematics. Subjects studied range from traditional courses in calculus and algebra to such new courses as mathematical modeling, in which a student may investigate problems in areas such as medical research, biology and engineering; and supercomputing, in which a student studies the design and analysis of algorithms used in the new generation of supercomputers.

The study of mathematics can prepare the student for careers in business, industry, teaching, law, government, medicine, engineering, and the sciences. The scope of these careers is continuously growing as computers become increasingly important in modern life.

**Computational Mathematics Group**

The Computational Math Group at CU-Denver is a broad-based response to the rapid and dramatic changes in the various fields of computation. The group resides in the Department of Mathematics, but is intended to be a highly interdisciplinary organization with associates in other departments at CU-Denver, on other campuses of the Front Range, and within the business and research community of greater Denver. The ultimate goal is that the Group become an internationally
recognized site at which computational mathematics thrives and is advanced.

Math Clinic

The Department of Mathematics conducts a Math Clinic for students in the undergraduate and graduate applied mathematics programs. The clinic is intended to illustrate the applicability and utility of mathematical concepts in investigations of various contemporary societal issues. Research problems investigated may originate from a variety of sources — business and industry, government agencies, educational institutions, or nonprofit organizations. Proposed projects are reviewed by a faculty panel and each research team investigates problems requiring substantial time commitments over one semester, the summer, or an entire academic year. Specific projects may require expertise from other disciplines (e.g., biology, economics, engineering), and in those instances students and faculty from the appropriate departments are included as part of the clinic team.

Computer Science


Computer Science Faculty: Gita Alaghband, Sanaa Azim, John Clark, Parker Fowler, Paul Novak, Doug Ross, Joe Thomas, William Wolle

Business: Peter Bryant, James Gerlach, Richard Hackathorn, Johan Karimi, Bob Kuo, William D. Murray

For students interested in studying computer science in depth, or preparing for a career in computer science, there are several options in the College and the University. The Department of Mathematics has established a Computational Mathematics Group which provides students with laboratory experience in computational mathematics and an opportunity to use various supercomputers and multiprocessors located throughout the country. Students have an opportunity to participate on research teams working on problems at the frontier of research in supercomputing.

Many students interested in computer science select the computer science option of the mathematics major. Details of this program can be found in the mathematics section of this catalog. Another possibility is to designate mathematics/computer science as a primary subject in the College's individually structured major program. In this program, a student completes 30 semester hours in computer science (and computer-related courses) and 30 semester hours distributed over one or two other subject areas. In addition to these options in the College, the College of Engineering and Applied Science offers a major in computer science and the College of Business offers a specialization in management science and information systems.

Undergraduate

The undergraduate program has five options from which students may choose depending on their interests or career plans: pure mathematics, applied mathematics, computer science, probability/statistics, and mathematics education. It also is possible for a student to minor in mathematics.

SELECTING A FIRST UNIVERSITY MATHEMATICS COURSE

The following information should assist you in choosing your first course in mathematics at CU-Denver. Be aware that admission to the beginning mathematics courses is controlled by standardized placement exams administered by the Testing Center (556-2861). If you need further information, contact a departmental advisor.

Business majors must take MATH. 1070 and either MATH. 1080 or 1401.

Other students taking mathematics courses at CU-Denver should use the following information. If you are a transfer or advanced placement student, and are starting with MATH. 2411 (Calculus II), or higher, see a departmental advisor if you have any questions. Otherwise, examine the following chart to determine your first course. Please note that admission may be determined by a placement exam.

TABLE TO GUIDE SELECTION OF FIRST CU-DENVER MATH COURSE

<table>
<thead>
<tr>
<th>Current Knowledge in Math</th>
<th>Recommended First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Less than 1 yr HS algebra and 1 yr HS geometry</td>
<td>Beginning algebra at a community college</td>
</tr>
<tr>
<td>B. 1 yr HS algebra and 1 year HS geometry</td>
<td>MAT. 112. at CCD</td>
</tr>
<tr>
<td>C. 2 yrs HS algebra and 1 yr HS geometry with:</td>
<td></td>
</tr>
<tr>
<td>(i) C average</td>
<td>MATH. 1110. (with “A” place exam)</td>
</tr>
<tr>
<td>(ii) at least B average</td>
<td>MATH. 1120. (with “A” place exam)</td>
</tr>
<tr>
<td>D. 2 yrs HS algebra and 1 yr HS geometry and trigonometry with:</td>
<td></td>
</tr>
<tr>
<td>(i) C average</td>
<td>MATH. 1130. (with “CR” place exam)</td>
</tr>
<tr>
<td>(ii) at least B average</td>
<td>MATH. 1401. (with “CR” place exam)</td>
</tr>
</tbody>
</table>

Requirements for a B.A. in Mathematics

A B.A. in mathematics may be earned by completing at least 30 semester hours in mathematics with an average of C (2.0) and with a grade of C- (1.7) or better in all courses. At least 24 of the 30 hours must be upper division (3000 or 4000 level) courses. All majors must complete the following:

1. Three semesters of calculus (MATH. 1401, 2411, 2421)
2. The three core courses: MATH. 3000, 3191, and 4408.
3. Two computer science courses approved by the advisor.
4. Required courses listed under at least one option.
5. Electives approved by the advisor.

It is highly recommended that a major take the Math Clinic (MATH. 4779). For more information see the Math Clinic brochure, the list of upcoming clinics, or the clinic director.
OPTIONS — REQUIRED COURSES

*Pure Mathematics*
1. Abstract Algebra (MATH. 3140).
2. Advanced Calculus I and II (MATH. 4310, 4320).

*Applied Mathematics Option*
3. Mathematical Modeling (MATH. 4791, 4792, or 4793).
4. Math Clinic (MATH. 4779).
5. A one-year sequence to be selected from the following:
   a. Advanced Calculus (MATH. 4310, 4320).
   b. Applied Graph Theory/Combinatorics (MATH. 4408, 4409).
   c. Artificial Intelligence (MATH. 4576, 4577).
   d. Numerical Analysis (MATH. 4650, 4660).
   e. Probability/Statistics (e.g., MATH. 3810, 3820, or MATH. 4810, 4820).
   f. Mathematical Modeling (Two courses from MATH. 4791, 4792, and 4793).

*Computer Science Option*
3. One of the following:
   a. Applied Combinatorics (MATH. 4409).
   b. Numerical Analysis II (MATH. 4660).
   c. Artificial Intelligence I (MATH. 4576).
4. The two computer science courses as noted above should be C SC. 1410, 2421.
5. Assembly Language Programming (C SC. 2525).
6. A course in parallel processing (MATH. 4673 or 4674).
7. Two other computer science electives approved by the advisor. (It is recommended that these be upper division.)

*Probability/Statistics Option*
1. Abstract Algebra (MATH. 3010 or 3140).
2. A one-year sequence in probability and statistics approved by the advisor (e.g., MATH. 3810/3820 or 4810/4820).
3. At least one statistical methods course approved by the advisor.

*Mathematics Education Option*
1. Abstract Algebra (MATH. 3140).

Note: MATH. 4220 is offered in the Spring of even numbered years. Students interested in teaching in public schools are required to be certified from the School of Education.

Suggested computer science electives for students in the Computer Science Option:
   - Data Structures (C SC. 3401), prer., C SC. 2421, 2525
   - Programming Languages (C SC. 3415), prer., C SC. 2421, 2525
   - Artificial Intelligence (MATH. 4576)

For the student interested in computer design:
   - (E. E. 2132), prer., calculus and physics
   - Introduction to Computer Engineering (E. E. 2651), prer., C SC. 1410, 1510

For the student with a background in COBOL programming and interested in business, there are several courses offered by the College of Business, e.g., ISMG. 3300, 3500, 4650, 4660, 4700
Other computer science electives must be approved by the advisor.

REQUIREMENTS FOR MATHEMATICS MINOR

MATH. 1401 and 2411
(or equivalents) ....................... 8 credits
At least 12 credits of electives, including
at least 9 hours of course work at the
3000 level or above and not including
MATH. 3030, 3040, 3250, 3260, 3830 ........................ 12 credits
Total .................................. 20 credits

*NOTE:* All mathematics courses numbered 3000 and above must be completed at CU-Denver. No grade below a C will be counted toward the minor requirements. Mathematics courses numbered lower than calculus cannot be counted toward the minor requirements.

Graduate

The Department of Mathematics offers the M.A. degree in mathematics, the M.S. degree in applied mathematics, and the Ph.D. degree in applied mathematics. (Also see Master of Basic Science.) Each of these degree programs conforms to the rules and policies of The Graduate School.

REQUIREMENTS FOR ADMISSION

To begin graduate work toward one of the above degrees, a student should have at least the following preparation: 30 semester hours of mathematics, at least 24 of which are at or above the level of

MATH. 3000. These courses should include a full year of advanced calculus, 3 semester hours of linear algebra, and 3 semester hours of either differential equations or abstract algebra.

Students who do not have all the prerequisites for one of the advanced degrees, or who have a cumulative undergraduate grade-point average that is less than 2.75, may still be admitted provisionally if, in the faculty's judgment, their record justifies this (also see The Graduate School admission requirements).

REQUIREMENTS FOR THE M.A. AND M.S. DEGREES

Students must present 30 hours of course work and maintain a 3.0 grade-point average for either of the master's degrees. At least 24 of these hours must consist of graduate level (numbered 5000 or higher) mathematics courses. Any courses taken outside of the department must be numbered 4000 or higher. Up to 9 semester hours may be transferred from other institutions.

There is no thesis requirement for either degree, although a thesis option is available. Following completion of course work, candidates must make a one hour oral presentation before a committee consisting of three graduate faculty members. There is no foreign language requirement for either master's degree.

The M.S. degree is designed to prepare a candidate to assume a position as an applied mathematician, a teacher, or to continue studies at the Ph.D. level. It provides training in applied mathematics as it is represented in the fields of (1) discrete mathematics, (2) operations research, (3) applied statistics, (4) applied probability, (5) computational mathematics, (6) mathematics of science and engineering, and (7) mathematical foundations of computer science. Each student must take either applied analysis or real analysis and applied linear algebra. The choice of one of the above seven options will determine additional course requirements.

The M.A. degree stresses traditional abstract mathematics to a greater degree than does the M.S. program and prepares a student for doctoral studies and teaching. Students are required to take graduate courses in real analysis, complex analysis, and abstract algebra. The remaining courses should be selected in consultation with a graduate advisor.

Every master's degree student is encouraged to participate in the Math Clinic, a unique program in which students have an opportunity to work on real-world problems supplied by local industry, research firms, and government agencies.
REQUIREMENTS FOR THE PH.D.

The mathematics department also offers a Ph.D. in applied mathematics. The degree is designed to give candidates a contemporary, in-depth education in applied mathematics and to provide research opportunities in the special fields of discrete mathematics, optimization, applied probability, computer science, computational mathematics, applied statistics, and the mathematics of science and engineering.

There are seven phases of the Ph.D. program. A candidate must fulfill course requirements, pass the preliminary examinations, establish a Ph.D. committee, meet the academic residency requirement, fulfill the language requirement, pass the comprehensive examination, and write and defend a thesis.

Students must complete 42 semester hours of formal (non-thesis) course work at the graduate level beyond the bachelor's degree, with at least four courses being at the Ph.D. level (6000-level courses) with the consent of the student's advisor. In addition, 30 hours of thesis credit must be taken. Specifically required courses are 3 hours of Math Clinic and 3 hours of readings courses. A 3.25 grade-point average must be maintained throughout all course work.

Six semesters of residence credit are required as specified in the rules of The Graduate School. All students are strongly advised to spend at least one year doing full-time course work or research with no outside employment.

The foreign language requirement consists of demonstrating fourth semester competency in one foreign language. Students are urged to select a language that is likely to prove useful in mathematical research.

The preliminary examination is designed to determine that students who intend to pursue the Ph.D. program are qualified to do so. The examination consists of two three-hour written parts in the areas of applied analysis and applied linear algebra. The examination is generally taken after three or four semesters of course work.

Application for candidacy is made after completion of the preliminary examination, the foreign language requirement, and three credits of residency. The application must be submitted at least two weeks before taking the comprehensive examination. The comprehensive examination is designed to measure breadth in applied mathematics and depth in a specific field. The breadth component is tested in an oral examination, the depth component in a written examination.

Each student must write and defend a thesis containing original contributions and evidence of significant scholarship. The thesis defense is public and must be given before an examining committee approved by the dean of The Graduate School.

COURSES

MATH. 1000-1. CLAS Computation Test. Meets one time only at which time the CLAS computation examination will be given to new students in CLAS. A passing grade on this examination satisfies the CLAS computation requirement. This is not a placement test.

MATH. 1070-3. Algebra for Social Sciences and Business. Sets and functions, linear programming, probability, and matrix algebra. Emphasis is on applications. Pr., grade of C or better in CDS's MAT. 112 or pass placement exam.

MATH. 1080-3. Polynomial Calculus. A one-semester course in calculus. No knowledge of trigonometry or analytic geometry is presupposed. Intended especially for social science and business students and for the general liberal arts student. Those planning to take more than one semester of calculus should take MATH. 1401 instead of MATH. 1080. Pr., two years high school algebra or MATH. 1070.

MATH. 1100-3. College Algebra. Topics in algebra designed for students who intend to take the calculus sequence. Pr., two years high school algebra and one year high school geometry and placement exam or CDS's MAT. 112. No co-credit with MATH. 1130.

MATH. 1120-3. College Trigonometry. Topics in trigonometry, analytic geometry, and elementary functions designed for students who intend taking the calculus sequence. Pr., MATH. 1110 or two years of high school algebra and one year high school geometry and placement exam. No co-credit with MATH. 1130.

MATH. 1130-4. Precalculus Mathematics. This is a condensed treatment of the topics in MATH. 1110 and 1120. Pr., two years of high school algebra, one year of high school geometry and trigonometry and placement exam. No co-credit with MATH. 1110 and 1120.

MATH. 1350-3. Computers in the Arts and Sciences. A laboratory course focusing on using computers to enhance human productivity in organizing, analyzing, writing, and graphically representing information. General topics include history, ethics, computer theory, problem solving, and social issues such as education, privacy and job evolution. Applications include the use of word processors, spread sheets, database managers, graphics tools, elementary PASCAL programming, and communications. Each student will have 2 hours per week of hands-on laboratory instruction using modern professional software.

MATH. 1401-4. Analytic Geometry and Calculus I. The first course of a three-semester sequence (MATH. 1401, 2411, 2421) in calculus. Students cannot receive credit for both MATH. 1080 and 1401. Topics covered include an introduction to differential and integral calculus, including applications of the derivative and the definite integral. Pr., MATH. 1120 or 1130; or two years high school algebra, one year high school geometry, and one-half to one year of trigonometry and placement exam.

MATH. 2000-3. Mathematics: A Human Endeavour. A course intended for non-majors. An examination of the science of mathematics from a humanistic viewpoint. Topics will include the relationship between mathematics and society, the internal conflicts in the mathematical community, and the philosophical basis of mathematics. This is a readings discussion class.

MATH. 2411-4. Analytic Geometry and Calculus II. The second of a three-semester sequence (MATH. 1401, 2411, 2421) in calculus. Topics covered include exponential, logarithmic, and trigonometric functions, techniques of integration, indeterminate forms and improper integrals, infinite series, and analytical geometry. Pr., MATH. 1401.

MATH. 2421-4. Analytic Geometry and Calculus III. The third of a three-semester sequence (MATH. 1401, 2411, 2421) in calculus. Topics covered include vectors, vector-valued functions, partial differentiation, multiple integrals and vector calculus. Pr., MATH. 2411.

MATH. 2614-3. Discrete Mathematics I. (C SC. 2614.) First course of a two-semester sequence to provide discrete mathematics concepts needed in computer science. Topics include propositional and predicate logic, methods of proof, mathematical induction, functions and relations, and principles of counting. Emphasis is placed on applications in computer science and the use of computer in problem solving. Pr., C SC. 1410 and 1510.

MATH. 2830-3. Introduction to Statistics. Study of basic statistical concepts. Introduction to statistical distributions, statistical inference, and hypothesis testing. Pr., college algebra or equivalent. Credit is not given to math majors for this course. No co-credit with MATH. 3810 or 3820.

MATH. 3000-3. Introduction to Abstract Mathematics. The student learns to prove and critique proofs of theorems by studying elementary topics in abstract mathematics, including such necessary basics as logic, sets, functions, equivalence relations, elementary combinatorics, and graph theory. Pr., MATH. 2411 or consent of instructor.

MATH. 3010-3. Applied Abstract Algebra. An introduction to those concepts in algebra and logic which have application to computer science. Topics will include finite state machines, formal languages.
Mathematics Courses / 223

groups, coding theory, and finite fields. Prer., MATH. 3000.
MATH. 3020-4. Elementary Differential Equations and Linear Algebra. Designed primarily for majors in applied science and engineering. Topics include elementary differential equations, matrices and determinants, vector spaces and linear transformations, characteristic values, linear differential equations and systems of differential equations. Prer., MATH. 2421 with grade of C or better. Students cannot receive credit for both MATH. 3020 and 3191 or 3200.
MATH. 3040-4. Mathematics for Elementary Teachers. Topics include intuitive and logical development of geometric ideas relevant to K-6 curriculum; measurement of length, area, volume, mass, angle, temperature, and time; stress is on the metric system; further study of the rational number system, probability and statistics; applications and problem solving. Carries credit only for elementary education majors.
MATH. 3110-3. Computer Applications in Mathematical Sciences. An advanced FORTRAN course for scientists and engineers. Aspects of optimal programming with respect to various goals and examination of programs that are appropriate to given contexts. Prer., consent of instructor.
MATH. 3191-3. Applied Linear Algebra. Designed primarily for students interested in applied mathematics, computer science, science, or engineering. Topics include solving systems of equations using Gaussian elimination with partial pivoting, LU — decomposition of matrices, matrix algebra, determinants, vector spaces, linear transformations, eigenvalues, and applications. Prer., MATH. 2411 with grade of C or better. Students cannot receive credit for both MATH. 3020 and 3191.
MATH. 3220-3. Elementary Differential Equations. Systematic introduction to ordinary differential equations. Topics include equations of order one, linear equations with constant coefficients, systems of equations, variation of parameters, the Laplace transform, and infinite series solutions to linear equations. Prer., MATH. 2421 and 3191. Students cannot receive credit for both MATH. 3020 and 3200.
MATH. 3210-3. Higher Geometry I. Axiomatic systems. The foundations of Euclidean and Lobachevskian geometries. Prer., MATH. 3000 or consent of department. This course is offered every fall semester.
MATH. 3250-3. Problem Solving with PASCAL I. A laboratory course that covers a wide variety of techniques for solving problems and for developing, refining, and coding algorithms using the computer language PASCAL. No previous programming experience is assumed.
MATH. 3260-3. Problem Solving with PASCAL II. A laboratory course that extends MATH. 3250 and covers an added variety of techniques for solving problems and for developing, refining, and coding algorithms using the computer language PASCAL. Topics include data structures, advanced PASCAL, graphics, and object-oriented problem solving and programming. Prer., MATH. 3250, C SC. 1410, or equivalent.
MATH. 3520-3. Computational Functions. Turing computers, computable functions, alternate formulations of computable functions, the halting problem and noncomputable functions, universal machines, Godel's incompleteness theorem, and undecidable theories. Prer., college algebra or consent of instructor.
MATH. 3614-3. Discrete Mathematics II. (C SC. 3614.) Second course of a two-semester sequence to provide discrete mathematical concepts needed in computer science. Topics include probability, recurrence equations, trees, graphs, matrix algebra, and an introduction to abstract algebra. Emphasis is placed on applications in computer science and the use of computers in problem solving. Prer., C SC. 2614 or MATH. 2814.
MATH. 3810-3. Introduction to Probability. Basic concepts, conditional and marginal probabilities, independence, discrete and continuous distributions, functions and moments of random variables, central limit theorem, characteristic functions. Students planning graduate work in mathematics should elect MATH. 4810. Students cannot receive credit for both MATH. 3810 and 4810. Prer., MATH. 2421.
MATH. 3939-1-3. Internship / Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.
MATH. 4020-3. Introduction to Topology. Metric spaces and topological spaces, completeness, separation properties, connectedness; Banach and Hilbert spaces. Prer., MATH. 3000 or consent of instructor.
MATH. 4110-3. Theory of Numbers. Divisibility, greatest common divisor, prime numbers, fundamental theorem of arithmetic, congruences, and other topics. Prer., MATH. 3000 or consent of instructor.
MATH. 4120-3. Topics in Mathematics. Special topics in mathematics will be covered. Students should check the current Schedule of Classes to obtain the topics to be covered as well as the prerequisites. With permission, this course may be taken for credit more than once.
MATH. 4150-3. Theory of Automata. Finite state machines, regular expressions, paths on graphs and the relations among these. Turing machines, some equivalent machines, the idea of computability. Prer., a full year of computer science.
MATH. 4220-3. Higher Geometry II. An introduction to the study of affine and projective geometry. This course is offered in the spring of even numbered years. Prer., MATH. 3210 or consent of instructor.
MATH. 4310-4. Advanced Calculus I. Calculus of one variable, the real number system, continuity, differentiation, integration theory. Prer., MATH. 2421 and 3000.
MATH. 4320-4. Advanced Calculus II. Sequences and series, convergence, uniform convergence; Taylor's theorem; calculus of several variables including continuity, differentiation and integration; Picard's theorem in ordinary differential equations and Fourier series. Prer., MATH. 4310.
MATH. 4330-3. Advanced Calculus III. Vector fields, implicit function theorem, inverse function theorem; Green's, Stokes' and divergence theorems; Taylor's theorem for functions of several variables: calculus on manifolds. Prer., MATH. 4320.
MATH. 4380-3. Advanced Calculus for Engineers II. Fourier series, Laplace transforms, Gamma and Beta functions, Bessel's functions, and other special functions. Prer., MATH. 4370.
MATH. 4387-3. Statistical Methods. Design and analysis of experiments, t-tests, chi-squared tests, analysis of variance, covariance, simple and multiple linear regression techniques, categorical data analysis. Prer., MATH. 2411 or consent of instructor.
MATH. 4408-3. Applied Graph Theory. (C SC. 4134.) An introduction to discrete structures and their applications. Major emphasis is on applications of graph theory to computer science, engineering, operations research, social science, and biology. Topics include connectivity, coloring, trees, Euler and Hamiltonian paths and circuits, matching and covering problems, shortest route, and network flows. Prer., MATH. 3000.

MATH. 4409-3. Applied Combinatorics. Major emphasis is on applied combinatorics and combinatorial algorithms, with applications in computer science and operations research. Topics include: general counting methods, generating functions, recurrence relations, inclusion-exclusion, Polya's enumeration theory, and block designs. Prer., MATH. 4408, and 3010 or 3140.

MATH. 4450-3. Complex Variables for Engineers and Scientists I. Topics include complex algebra, Cauchy-Riemann equations, Laurent expansions, theory of residues, complex integration, and introduction to conformal mapping. Technique and applicability are stressed. Prer., MATH. 3020 or 3200.

MATH. 4460-3. Complex Variables for Engineers and Scientists II. A continuation of MATH. 4450, with coverage dependent partly on the interests of the class. Topics include Schwartz-Christofel transformations and thorough development of techniques of conformal mappings. Solution of boundary value problems will be emphasized. Prer., MATH. 4450.

MATH. 4470-3. Introduction to Partial Differential Equations I. Boundary value problems for the wave, heat, and Laplace equations; separation of variables method, eigenvalue problems, Fourier series, and orthogonal systems. Prer., MATH. 3200 or 3020.


MATH. 4560-3. Laplace Transforms for Engineers and Scientists. Topics include the general methods, transforms of special functions, heaviside expansion theorems, transforms of periodic functions, convolution integrals, the inverse transforms, and solutions of ordinary and partial differential equations. Prer., MATH. 3020 or 3200.

MATH. 4576-3, 4577-3. Mathematical Foundations of Artificial Intelligence I and II. Topics include logic-related mathematical foundations; knowledge representation and models of thought and learning; search algorithms and heuristics for problem solving; pattern recognition concepts, methods, and applications; expert systems and game theory. Prer., C SC. 1410.

MATH. 4580-3. Calculus of Variations for Engineers and Scientists. Techniques and applications of the powerful tools of the variational calculus will be developed and both classical and modern optimization problems will be attacked. Prer., MATH. 3200 and 4470.


MATH. 4673-3. Parallel Computing and Ada. Covers the language Ada and general issues related to parallel/concurrent computing: synchronization, deadlock, starvation, load balancing, comparison of parallel architectures. Amdahl's law, limits on parallelism, and object-oriented problem solving in parallel programming. Ada is taught so students have at least one-half semester to practice parallel programming using Ada tasks. Prer., minimum of one year of PASCAL or C.


MATH. 4730-2, 4740-2. Honors Seminar. Intended for candidates for departmental honors and other superior students. Topics covered vary from year to year. Student participation is stressed. Prer., MATH. 3000 or 3190.

MATH. 4750-3. Topics in Finite Mathematics. Especially suitable for those students who are not majoring in engineering or physical science. Prer., consent of department.

MATH. 4779-3. Math Clinic. The clinic is intended to illustrate the applicability and utility of mathematical concepts in investigations of various contemporary societal issues.
MATH. 4840-1 to 3. Independent Study (Undergraduate). Variable credit depending on the needs of students. This course is listed for the benefit of the advanced student who desires to pursue one or more topics in considerable depth. Supervision by a full-time faculty member is necessary, and the deans office must concur. Students may register for this course more than once with department approval.

Graduate Level

MATH. 5010-3. History of Mathematics. A history of the development of mathematical techniques and ideas from early civilization to the present including the interrelationships of mathematics and sciences. Prer., Math 1401. Not open to students who have had MATH 4010.


MATH. 5070-3. Applied Analysis. Course is designed to serve as an introduction to MATH. 5131. Topics include point set topology in metric spaces, properties of functions, sequences and series of functions, fixed point theory, complex functions, differentiation of complex functions, contour integration, Taylor and Laurent series. Prer., MATH. 4320.


MATH. 5131-3. Introduction to Real Analysis. Zorn's lemma, metric and normed linear spaces, completions, continuous functions, Riemann-Stieljes and Lebesgue integration, measure theory. Prer., MATH. 5070 or consent of instructor.


MATH. 5221-3, 5222-3. Projective Geometry I and II. Advanced topics in projective geometry. Topics may include finite projective planes, free projective planes, derivation, collineation groups, higher dimensional projective spaces, ovals and ovoids. Prer., MATH. 4220 and 3191 and MATH. 3010 or 3140, or consent of instructor.

MATH. 5223-3, 5224-3. Introduction to Differential Geometry I and II. Differential forms in Euclidean space, frame fields, Frenet formulas, calculus of differential forms on surfaces, extrinsic and intrinsic geometry of surfaces, Riemannian geometry of different manifolds, geodesics, curvature, the Gauss-Bonnet theorem. Prer., MATH. 4320.

MATH. 5250-3, 5260-3. Problem Solving with PASCAL I, II. These courses will focus on problem solving through the development and use of computer algorithms. Participants will be taught the computer language PASCAL, which will be used to solve a wide variety of practical problems. Both courses are appropriate for elementary teachers, as well as teachers of social and natural sciences, and mathematics. For MATH. 5250, no previous programming experience is needed. Knowledge of PASCAL is needed for MATH. 5260.


MATH. 5380-3. Sample Surveys. Application of statistical sampling theory to the design of population surveys, including simple random, stratified, systematic and cluster sampling, the sources of errors, Ration estimates and cost minimization. Prer., consent of instructor.

MATH. 5381-3, 5382-3. Mathematical Statistics I and II. Mathematical theory of statistics. Topics covered will include discrete and continuous probability models, estimation and testing of hypotheses, multivariate analysis, nonparametric inference. Prer., MATH. 3191, 3810, 3820, or consent of instructor.


MATH. 5387-3. Statistical Methods in Research. A one-semester course in the design and analysis of experiments employing various statistical techniques, such as t-tests, chi-square tests, analysis of variance and covariance, regression, analysis, distribution-free methods, graphical and other quick and approximate procedures. Emphasis is on the application of the above techniques as an aid to research in behavioral, biological, and physical sciences. Prer., consent of instructor.

MATH. 5388-3. Statistical Methods for Data Analysis. A continuation of MATH. 5387. Application of the method of least squares in the fitting of linear and nonlinear models to data. Analysis of balanced, unbalanced, and unplanned experiments. Use of packaged computer programs. The emphasis will be on the practical aspects of applying statistical techniques to the analysis of data. Prer., MATH. 5387 or consent of instructor.


MATH. 5395-3. Multivariate Methods. This course provides basic statistical concepts and methods to analyze multivariate data. Topics covered are multivariate hypothesis testing and estimation, multivariate analysis of variance, factor analysis, multidimensional scaling, and principal components. Prer., MATH. 5381.
specializing in operations research and/or optimization. Theoretical aspects of linear programming, including the theory of linear inequalities and polyhedra, is covered. Commonly used solution techniques are introduced.

MATH. 5660-3, 5661-3. Numerical Analysis I, II. (C SC. 5606, 5616.) This is a full year, graduate level survey course in numerical analysis. The essential topics of the course include error analysis, direct and iterative methods of solution of systems of linear equations, solution of nonlinear equations and systems of equations, interpolation and approximation, numerical differentiation and integration, numerical solution of ordinary and partial differential equations. Prer., MATH. 3191, 3200, and programming experience.


MATH. 5665-3. Nonlinear Optimization. (C SC. 5656.) This course presents mathematical foundations of optimization with focus on nonlinear forms. Topics include convexity, duality, and optimality conditions. Concepts of algorithm design and analysis are developed from these basic topics and elements of fixed point theory. Particular algorithms are considered for unconstrained, linearly constrained, and nonlinearly constrained models.


MATH. 5737-3, 5738-3. Topics in Applied Mathematics. Selected topics in mathematical problems arising from various applied fields such as mechanics, electromagnetic theory, economics, etc. Prer., consent of instructor.

MATH. 5741-3, 5742-3. Calculus of Variations I, II. Classical necessary and sufficient conditions with emphasis on the simplest problems; the problem of Lagrange, and the problem of optimal control. Direct methods and applications. Prer., MATH. 4320 and 4920.

value problems, eigenfunction expansions, and potential theory. Prer., MATH. 4320.

MATH. 5779-3. Math Clinic. The clinic is intended to illustrate the applicability and utility in mathematical concepts in investigations of various contemporary societal issues. Research problems investigated by the clinic may originate from a variety of sources — business and industry, government agencies, educational institutions, or nonprofit organizations. Supervised by University faculty, each research team investigates problems requiring substantial time commitments over one semester, the summer, or an entire academic year. Proposed projects are reviewed by a faculty panel prior to final approval. Prer., MATH. 2411.

MATH. 5791-3. Continuous Modeling. This course surveys a variety of mathematical problems that arise in the natural sciences and engineering. Topics, which vary with the instructor, may include population models, epidemic models, mechanics, heat transfer and diffusion, tomography, pharmacokinetics, traffic flow, fractal models, wave phenomena, natural resource management, and underground water flow. In keeping with the title of the course, most models discussed are based on differential and integral equations. The emphasis of the course is formulation and validation of models as well as methods of solution. Prer., MATH. 3911, 3929.

MATH. 5792-3. Probabilistic Modeling. This course covers Markov chains, Poisson processes, continuous Markov chains, elementary topics in queueing theory and some mathematical aspects of Monte-Carlo simulation including random variate generation, variance reduction, and output analysis. Prer., either MATH. 3810 or 4810 and some programming experience.

MATH. 5793-3. Discrete Modeling. This course will focus on the use of discrete modeling to solve problems in a wide variety of disciplines. Applications will be selected from computer science, communication networks, economics, operations research, and the social, biological, and environmental sciences. Graph theory and combinatorics are the basic mathematical tools. Prer., MATH. 4408 and 5396.

MATH. 5803-3. Problem Solving and Mathematics for Professional Teachers I. Designed for professional teachers who teach mathematics as part of their assignment. Emphasis is on the topics of arithmetic and the mathematics encountered in teaching. The instruction is developed around models of the mathematical notions with emphasis on techniques of problem solving. Instruction on the use of computers and calculators is integrated into the course, but no previous programming experience is presumed.

MATH. 5804-3. Topics in Mathematics for Teachers. Designed for teachers who teach mathematics as part of their assignment. Topics may vary, but include number theory, finite mathematics, geometry, probability, and statistics. Emphasis is on hands-on learning and relevance to school mathematics. MATH. 5939-1 to 3. Cooperative Education.

MATH. 5950-1 to 6. Master's Thesis. This course is only for students writing a master's thesis.


MATH. 6405-3. Graph Theory. This course will cover advanced topics in graph theory and combinatorics. Specific topics will vary by semester. Prer., graduate course in graph theory.


MATH. 6594-3. Integer Programming. This course covers aspects of integer programming including polyhedral theory, valid inequalities, superadditive duality, and algorithms for integer programming. Prer., MATH. 5593.

MATH. 6698-3. Multigrid Methods of Large Scale Computational Models II. Multigrid methods are fairly sophisticated techniques for efficient solution of many large scale computational problems, most notable partial differential equations. This course will provide a thorough introduction to basic multigrid principles followed by an exploration into more advanced applications. Prer., MATH. 3911 and 4650.


The following six reading courses are offered regularly primarily for Ph.D. students who have reached the research level in the designated fields. The seminar format of these courses requires significant student participation. Prer., consent of instructor.

MATH. 7921-variable credit. Readings in Mathematics of Science and Engineering.

MATH. 7922-variable credit. Readings in Mathematical Foundations of Computer Science.

MATH. 7923-variable credit. Readings in Discrete Mathematics.

MATH. 7924-variable credit. Readings in Computational Mathematics.

MATH. 7925-variable credit. Readings in Operations Research.

MATH. 7926-variable credit. Readings in Applied Statistics.

MATH. 8990-1 to 10. Doctoral Dissertation. This course is only for students working on their Ph.D. research.

Independent Study

MATH. 5840-1 to 6. Independent Study (Graduate). Available only through the approval of the graduate advisor. Subjects arranged to fit the needs of the particular students.

MATH. 6840-1 to 3. Independent Study (Graduate). This course is available only to Ph.D. students.

MODERN LANGUAGES, DEPARTMENT OF

Chair: Francisco Rios
Office: CN 206A
Telephone: 556-4893

French Faculty: Associate Professor:
Blandine M. Rickert
Assistant Professors: Diane M. Dansereau, Kevin C. O'Neill

German Faculty: Associate Professors:
M. Kent Casper, Carsten E. Seeceamp
Assistant Professor: Mark Lehrer

Spanish Faculty: Associate Professors:
Francisco A. Rios, Donald L. Schmidt
Assistant Professor: Kimberly A. Habegger

The Department of Modern Languages includes Chinese, French, German, Russian, and Spanish. At present, majors and minors are available in all but Chinese and Russian. The department strongly recommends that all majors and minors include some study in an appropriate country abroad while they are fulfilling their degree requirements at CU-Denver. Credit will normally count toward satisfaction of the major and minor requirements, but the student should see an advisor before enrolling in a program abroad to assure full transfer of credit.

Courses taken abroad and designated as French, German, or Spanish beyond the first year are subject to the 48-hour-
maximum rule in the College of Liberal Arts and Sciences regarding credit hours applied to a degree from a single discipline. An Honors program leading to graduation cum laude, magna cum laude, or summa cum laude, is available to all qualified majors in French, German, and Spanish. See a department advisor for details.

In addition to fulfilling the major and minor, courses in the Department of Modern Languages prepare students in language, literature, and civilization as a part of an enhanced liberal education, and certain courses in each language are accepted as core courses toward the B.A. degree in the College of Liberal Arts and Sciences.

Some courses also support such programs as those leading to the teaching certificate, the Master of Humanities degree, and the Master of Arts degree in bilingual education studies offered at CU-Denver, as well as programs leading to the M.A. degree in French, German, and Spanish offered in conjunction with the Boulder campus. Only courses numbered 5000 and above may be applied to the master's degree; students enrolled in a master's program in French, German, or Spanish should consult with their advisor in Boulder before enrolling in courses on the Denver campus.

**Foreign Language Requirement**

Students who have completed a Level III high school course in a second language have satisfied the College requirement in foreign language. The requirement may also be satisfied by completion of a third-semester course in Chinese, French, German, Russian, or Spanish, or by demonstration of equivalent proficiency by placement test. Students who have studied a second language in high school and wish to continue with it will be placed according to their high school record and verbal SAT or ACT score. Students may not receive credit for a course lower than that into which they are placed. For a complete statement of policy on foreign language placement and credit, see the statement on foreign language available from the College Advising Office.

**Programs of Study**

**CHINESE**

CHIN. 1010-5. Beginning Chinese I. A basic introduction to Chinese language and culture. Students will study pronunciation, vocabulary, grammar, and simple writing techniques. Prer., no prior study of Chinese. Students who have studied Chinese prior to enrolling at CU-Denver should consult with a department advisor before enrolling in CHIN. 1010.

CHIN. 1020-5. Beginning Chinese II.
Continuation of CHIN. 1010. Further practice of pronunciation, and study of vocabulary, grammar, and simple writing techniques. Prer., CHIN. 1010 or placement. Students who have studied Chinese prior to enrolling at CU-Denver should consult with a department advisor before enrolling in CHIN. 1020.

CHIN. 2110-5. Second Year Chinese I.
Continuing development of listening, speaking, reading, and writing skills in practical Chinese, with grammar review and introduction of the Chinese dictionary. In addition to contemporary Chinese, there will be some emphasis on Chinese classical materials, such as proverbs. Prer., CHIN. 1020 or placement by exam. Students who have studied Chinese prior to enrolling at CU-Denver should consult a department advisor before enrolling in CHIN. 2110.

CHIN. 2120-5. Second Year Chinese II.
Continuation of CHIN. 2110. Prer., CHIN. 2110 or placement by exam. CHIN. 2120 satisfies the fourth semester language requirement at most graduate schools.

**FRENCH**

**Undergraduate**

The French program offers a variety of courses for students interested in French language, literature, civilization, and culture. Two options are available for the major, and two for the minor. Requirements for the Major. Students majoring in French must complete a minimum of 36 semester hours beyond first-year proficiency. Students presenting four years of high school French for admission must complete 30 hours beyond the second year. At least 18 credit hours of upper division work must be taken from the faculty in French at CU-Denver. Courses taken at other institutions while a student is enrolled at CU-Denver may be applied to the major only with department approval prior to enrollment in those courses. No courses taken on a pass/fail basis may be credited toward the major, and no grade of less than C may be credited toward the minor.

Requirements for the Oral emphasis include FR. 2110, 2120 or 2130, 3010, 3020, 3202, and 6 hours of electives at or above the 2000 level. Requirements for the written emphasis include FR. 2110, 2120 or 2130, 3050, 3112, 3122, and 6 hours of electives at or above the 2000 level.

Students planning to acquire certification for teaching French at the secondary level are required to take FR. 4960, Methods of Teaching Modern Languages. Also, prior to enrolling in student teaching with the School of Education, the student must demonstrate oral and written proficiency in French through an examination administered by the Department of Modern Languages. The student should see an advisor in French for details.

Students must see the department advisor prior to registration for 3000-level courses. Since all courses are not offered every year, it is extremely important for students to plan their schedules in advance to avoid a delay in graduation. Students majoring in French must satisfy the requirements of the College of Liberal Arts and Sciences.

**Graduate**

At present CU-Denver offers no French courses above 5999. The courses at the 5000 level are applicable to an M.A. degree through the University of Colorado at Boulder and to the Master of Humanities program at CU-Denver.
dependi n g u pon degree plan approval by the appropriate graduate advisor.

COURSES

FR. 1010-5. Beginning French I. An introductory course for beginners, designed to teach comprehension, speech, reading, and writing in French. Basic grammatical and syntactic structures are introduced, together with an elementary vocabulary that allows the student to formulate simple questions and answers. Prer., no previous study of French. Students who have had French in high school or elsewhere should consult with an advisor in order to avoid loss of credit.

FR. 1020-5. Beginning French II. Continuation of FR. 1010. More complex grammatical structures are introduced and the elementary vocabulary is expanded to enable the student to carry on short conversations in French. Cultural items of special interest are added by the instructor. Prer., FR. 1010 or placement by exam. Students who have had French in high school or elsewhere should consult with an advisor in order to avoid loss of credit.

FR. 2110-3. Conversation and Culture. Designed to 1) develop skills in listening, speaking, and reading; and 2) give the student an introduction to French contemporary culture. It provides: 1) cultural readings that reflect the customs, thoughts, and everyday life of the French people; and 2) activities intended to increase communication skills. Emphasis on conversation, but there is also a review of grammar. Prer., FR. 1020 or placement by exam. Students who have had French in high school or elsewhere should consult with an advisor in order to avoid loss of credit.

Important Note: FR. 2110 is not a prerequisite for FR. 2120. Students may choose FR. 2120 or FR. 2110 to complete the third semester language requirement. Both courses are required for French majors and minors and can be taken concurrently. If they are not taken concurrently, it is strongly suggested that FR. 2110 be taken before 2120.

FR. 2120-3. Reading and Composition. Focuses on developing skills in reading and writing, and includes grammar review. The reader provides a variety of French short stories designed for the intermediate level. Students are asked to express their reactions to the stories and to write compositions based on the texts studied or on related subjects. Prer., FR. 1020 or placement by exam. Students who have had French in high school or elsewhere should consult with an advisor in order to avoid loss of credit.

Important Note: FR. 2110 is not a prerequisite for FR. 2120. Students may choose FR. 2110 or 2120 to complete the third semester language requirement. Both courses are required for French majors and minors and can be taken concurrently. If they are not taken concurrently, it is strongly suggested that FR. 2110 be taken before 2120.

FR. 2130-3. Current Topics of the French Speaking World. Intended for those majoring or minoring in the International Affairs Program, but is open to all those wanting to take a fourth semester language course in French for the purpose of satisfying a fourth semester language requirement or qualifying for continuation into upper division French courses. Increased mastery of oral and written French is a primary objective, as in other fourth semester courses. This course combines discussion and writing on political, economic, and social conditions in contemporary France with grammar review. Articles from current French newspapers, news magazines, and television broadcasts are analyzed for a better understanding of how the French see themselves and the world. FR. 2130 satisfies the language requirement for the minor in International Affairs, may be applied toward the major or minor in French, and will satisfy the fourth semester foreign language requirement at most graduate schools. Prer., FR. 2110 or 2120 or fourth semester placement.

FR. 2980/3980-3. Topics in French Literature in English. Courses in specialized areas of French literature will be offered at regular intervals. Topics will include: eroticism in French literature; women in French literature; literature and social change in France; exoticism in French literature; great French books; literature and French national character; classical and baroque themes.

FR. 3010-3. French Phonetics and Pronunciation. Helps the student acquire some durable articulatory speech habits through knowledge of phonetics such as the function of the speech organs, accurate production and recognition of sound, and the use of phonetic symbols. Attendance is required. Students are asked to spend some time in the Language Lab to get added practice in hearing and pronunciation. Prer., FR. 2110 and 2120, or FR. 2130, or consent of instructor. For students who have already taken FR. 2110, FR. 2120 may be taken concurrently with FR. 3010.

FR. 3020-3. Oral Practice. Conversation course, using skills, debates, small-group discussion, and oral presentations to improve fluency in spoken French and build vocabulary. Discussions center around current issues. Prer., FR. 3010 or consent of instructor.

FR. 3050-3. French Composition I. Development of writing skills through analysis and discussions of selections from French writers. Through questions and written exercises students familiarize themselves with vocabulary, spelling, syntax, and grammar. Prer., FR. 2110 and 2120 or 2130 or consent of instructor.

FR. 3112-3. Main Currents of French Literature I. Introductory survey of the major literary trends and prominent writers of French literature from 842 to the Revolution. Prer., FR. 2110 and 2120 or FR. 2130, or consent of instructor.

FR. 3122-3. Main Currents of French Literature II. Introductory survey of the major literary trends (romanticism, realism, existentialism, etc.) and writers of the 19th and 20th centuries. Students become acquainted with prominent writers of the period such as Hugo, Balzac, Stendhal, Flaubert, Proust, Gide, Camus, Sartre. Prer., FR. 2110 and 2120 or 2130, or consent of instructor.

FR. 3202-3. France in the 20th Century. Combines a number of themes of permanent relevance (education, the family, justice, communication, the arts, etc.) with issues of current interest in the French-speaking world (urban renewal, immigrant workers, anti-semitism, French-Canadian nationalism, the independentist movement in New Caledonia, nouvelle cuisine, etc.). Prer., FR. 2110 and 2120 or consent of instructor.

FR. 4010-3. Advanced Composition. Improvement of writing skills and development of the student's ability to compose logically and convincingly. Stresses difficult grammar points (subjunctive, conditional, passive, etc.) and idiomatic expressions. The technique of explication de textes will be studied. Prer., FR. 3050 or consent of instructor.

FR. 4050-3. Advanced French for Business. Concentrates on the technical language necessary to meet the economic and commercial needs of the modern world. Prepares students for the Practical Certificate of Business and Economic French of the Paris Chamber of Commerce. Prer., FR. 3050 and 4010 or at least 8 French courses beyond the first year, or consent of the French advisor. FR. 4010 may be taken concurrently with FR. 4050.

FR. 4200-3. French Civilization to 1789. Development of French culture and civilization from a historical perspective, beginning with the origins of France and ending with the French revolution in 1789. The following topics are covered: Historical background, sciences and techniques, daily life, the arts, literature and philosophy, and religion. Prer., FR. 3020 and 3202, or 3020 and 3112, or consent of instructor.

FR. 4210-3. French Civilization from 1789. Continuing of FR. 4200. The development of French culture and civilization in a historical perspective from the Revolution to the present. The following topics are covered: historical background, sciences and techniques, daily life, the arts, literature and philosophy, and religion. Prer., FR. 3020 and 3202, or 3020 and 3112, or 4200, or consent of instructor.
Upper Division/Graduate Level
FR. 4310/5310-3. Seventeenth Century French Theatre and Poetry. In-depth study of the century considered to be the pinnacle of French theatre. Includes plays by Racine, Moliere, and Corneille as well as poetry by LaFontaine and Boileau. Prer., for FR. 4310: FR. 3112 and 3122 or consent of instructor; for FR. 5310: graduate standing in French. The course is open to qualifying undergraduate seniors.
FR. 4360/5360-3. Eighteenth Century Novel, Theatre, and Poetry. The study of several novels and plays characteristic of the 18th century as well as some of the more famous poems. Includes Diderot, Rousseau, Voltaire, Marivaux, and Laclos. Prer., for FR. 4360: FR. 3112 and 3122 or consent of instructor; for FR. 5360: graduate standing in French. The course is open to qualifying undergraduate seniors.
FR. 4430/5430-3. Nineteenth Century French Novel. Development of the French novel during the 19th century. Includes such writers as Stendhal, Hugo, Balzac, George Sand, Flaubert, Maupassant, and Zola. Prer., for FR. 4430: FR. 3112 and 3122 or consent of instructor; for FR. 5430: graduate standing in French. The course is open to qualifying undergraduate seniors.
FR. 4480/5480-3. Twentieth Century French Theatre. A survey of the major movements in French literature of the 20th century as represented in the theatre arts. Such authors as Jarry, Artaud, Apollinaire, Duras. Prer., for FR. 4480: FR. 3112 and 3122, or consent of instructor; for FR. 5480: graduate standing in French. The course is open to qualifying undergraduate seniors.
FR. 4960/5690-3. Methods of Teaching Modern Languages. Requirement for language majors in the Teacher Certification Program, School of Education, CU-Denver. Normally taken immediately prior to student teaching. Methodology of teaching French, German, and Spanish in an urban setting. Normally students should have completed all other requirements for the major.

Independent Study
FR. 4840-1-3. Independent Study (Upper division).
FR. 5840-variable credit. Independent Study (Graduate level).

GERMAN
Undergraduate
The German program provides a variety of courses for students interested in German language, literature, history, philosophy, music, and art. The curriculum contains essentially three course clusters: basic language skills courses, from beginning through advanced levels; upper division literature courses taught in German; and German area studies courses taught in English with readings in English translation.
Requirements for the Major. Students majoring in German must complete 36 hours beyond first-year proficiency. Not more than 12 hours may be taken on the second-year level toward the major. Course work successfully completed at other institutions will be evaluated for credit transfer, but a minimum of 18 hours of upper division credits must be taken from the faculty in German at CU-Denver. Courses taken at other institutions while a student is enrolled at CU-Denver may be applied to the minor only with departmental approval before enrollment in those courses. No courses taken on a pass/fail basis may be credited toward the minor, and no grade of less than C may be credited toward the minor. Courses are to be distributed as follows:
2000 level — a minimum of any two courses is required before a student may take upper division courses.
3000 level — GER. 3010 and 3020 are required.
The remaining 9 hours are electives of which at least 6 hours must be taken at the 3000 or 4000 level.

COURSES
GER. 1010-5. Beginning German I. Introduction to basic grammar, sentence structure, and speech patterns.
GER. 1020-5. Beginning German II. Continuation of GER. 1010. Prer. GER. 1010 or one year of high school German.
GER. 2110-3. Practical Everyday German. Stresses developing conversational ability in the kind of language one would encounter in normal everyday situations in Germany. Prer. GER. 1020 or two years of high school German.
GER. 2120-3. Conversation and Culture. Topics for discussion in German till acquaint students with interesting aspects of German culture; readings offer culture; readings offer a kaleidoscopic sampling from both the past the present. Prer. GER. 1020 or two years of high school German.
GER. 2130-3. Current Topics of the German-Speaking World. This course is a fourth semester course inspired for those majoring or minorin in the International Affairs Program, but is open to all those wanting to satisfy a fourth semester language requirement or to qualify for upper division German courses. Along with grammar review, the course deals with contemporary topics in cultural, political, economic, and social affairs. This course satisfies the language requirement for the minor in International Affairs. May be applied for the major in German, and will satisfy...
the fourth semester foreign language requirement at most graduate schools. Prer., GER. 2110 or 2120 or placement by exam, or consent of instructor.

GER. 2210-3. Readings and Translation. Stresses reading and translation skills rather than speaking. Students work with short German texts in a variety of areas: natural and social sciences, history, literature, etc. Lectures in English. Prer., GER 1020.

GER. 3010-3. Advanced Conversation and Grammar. Emphasis on developing conversational ability with more complicated idiomatic and structural elements. Reading normally from contemporary periodicals, newspapers, and literature. Prer., GER. 2110 or 2120 or consent of instructor.

GER. 3020-3. Advanced Conversation and Composition. Continuation of GER. 3010 with stress on written expression. Prer., GER. 3010 or consent of instructor.

GER. 3939-1-3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

GER. 4010-3. Idiom and Stylistics I. Analysis of and practice with more complex German usage in descriptive, literary, and scientific texts. Emphasis on increasing understanding of refinements in style and idiom.

GER. 4020-3. Idiom and Stylistics II. Continuation of GER. 4010.

Literature in German

GER. 3110-3. Introduction to German Literature I. Selected readings from German short stories, drama, and poetry, primarily from the modern period. Emphasis on techniques of reading. Conducted in German. Prer., GER. 2110 or 2120, or consent of instructor.

GER. 3120-3. Introduction to German Literature II. Selected readings from German literature with emphasis on literary styles and movements and relationship to larger cultural patterns. Conducted in German. Prer., GER. 2110 or 2120, or consent of instructor.

GER. 3330-3. German Classical Literature. The Age of Idealism prior to Romanticism will be explored through the writings of Lessing, Goethe, and Schiller, and through lectures on the historical, philosophical, and social components of the times. Includes some treatment of classical German music. Conducted in German. Prer., any third-level German course.


GER. 4110-3. Issues and Currents in Modern German Literature. The topic focus will vary, concentrating on a given theme or problem area in the 20th century (e.g., Modern Transformations of the Faust Figure, the Modern Drama of Revolution, the New Men of Expressionism, etc.). Conducted in German. Prer., at least one third-level literature course in German.

GER. 4120-3. Issues and Currents in 18th-and 19th-Century German Literature. Format similar to GER. 4110. Topical focus varies with each offering (e.g., the Symbolism of Goethe’s Poetry, the Fairy-Tale Pattern in the Romantic Tale, Schiller’s Aesthetics in Theory and Drama, etc.). Conducted in German. Prer., at least one third-level literature course in German.

German Area Studies in English Translation

NOTE: Courses conducted in English with texts in English translation. Credit toward German major is given if some work (to be specified by the instructor) is done in German.


GER. 2520/3520-3. German Romanticism and the Modern Spirit. Exploration of the modern works of modern German Romantics like Herzog and those of the originators of Romanticism in the late 18th and early 19th centuries, demonstrating through parallels and contrasts how German Romantic thought, literature, and art continue to have an impact on the modern world.

GER. 2810/3810-3. German Literature in Translation I. Course will focus on close reading of two or three German authors, primarily from the 18th and 19th centuries, such as Goethe, Schiller, Buchner, and Kleist.

GER. 2822/3822-3. German Literature in Translation II. Thorough study of two or three authors from the late 19th and early 20th centuries, such as Hauptmann, Mann, Hesse, Grass, Brecht, and Kafka.

GER. 3230-3. German Civilization I: From Medieval Through Age of Idealism. Selected highlights of major cultural aspects of the Middle Ages, the Reformation, the Enlightenment, and the Age of Idealism.

GER. 3240-3. German Civilization II: The Modern Age. Selected highlights of major cultural aspects of the later 19th century, the Wilhelminian period, the Weimar Republic, the Third Reich, and the period since 1945.

GER. 3532-3. Aestheticism and Decadence: Art and Literature at the Turn of the Century. This course examines European aestheticism as artistic movement and as lifestyle around 1900. Recurring motifs and topics will include seduction, artifice, the assault on nature, and, above all, decadence. Authors include Hugo von Hofmannsthal, Thomas Mann, Nietzsche, Wilde, and Joyce.

GER. 4942-3. Seminar: Literature and the Visual Art. Interdisciplinary, team-taught course with fine arts department. Topical focus varies with each offering. Investigation of literature and painting, sculpture, architecture within a given period or movement (e.g., romanticism, symbolism, surrealism, etc.).


Independent Study

GER. 4840-1-3. Independent Study (Upper division).

GER. 5840-variable credit. Independent Study (Graduate level I).

RUSSIAN

RUSS. 1010-5. Beginning Russian I. Introduction to the Russian language. Pronunciation, alphabet, grammar, and basic vocabulary. Prer., no prior study of Russian. Students who have studied Russian before enrolling at CU-Denver should consult with a department advisor before enrolling in RUSS. 1010.

RUSS. 1020-5. Beginning Russian II. Continuation of RUSS. 1010. Further practice of pronunciation, and study of grammar and vocabulary. Prer., RUSS. 1010 or placement. Students who have studied Russian before enrolling at CU-Denver should consult with a department advisor before enrolling in RUSS. 1020.

RUSS. 2110-3. Second Year Russian I. Listening, speaking, reading, and writing skills will be developed, using more complex grammatical constructions and expanded vocabulary. Russian will be used as much as possible, and communicative activities will be emphasized in the classroom as a means of increasing the students ability to communicate in Russian. Prer., RUSS. 1020 or placement by exam. Students who have studied Russian before enrolling at CU-Denver should consult a department advisor before enrolling in RUSS. 2110.

RUSS. 2130-3. Current Topics in the Russian Speaking World. A fourth semester course designed for those majoring or minoring in the International Affairs Program, but open as well to all those wanting...
to satisfy a fourth semester language requirement. Along with grammar review and using a multi-media approach, this course deals with contemporary topics in Soviet cultural, political, and social affairs. Authentic texts are used in the classroom, including newspaper articles for developing reading skills, and Soviet newscasts with accompanying exercises for developing listening comprehension. Prer., RUSS 2110, placement by exam, or consent of instructor. RUSS 2130 satisfies the fourth semester language requirement at most graduate schools.

SPANISH

Undergraduate

The Spanish programs emphasize all phases of the study of the language, literature, civilization, and culture of Spain, Hispanic America, and the Spanish-speaking Southwest of the U.S.

Requirements for the Major. A major in Spanish consists of the following requirements:

General Requirements

1. A minimum of 30 credit hours of upper division (3000 and above). None of the required hours may be taken on a pass/fail basis, and no grade of less than C may be credited toward the major. Courses taken at other institutions while a student is enrolled at CU-Denver may be applied to the major only with departmental approval before enrollment in those courses.
2. A minimum of 12 credit hours at the 4000 level.
3. In addition to the 30 credit hours in Spanish, a minimum of 6 credit hours from one or more of the following areas: (a) Latin American studies (e.g., history, political science, etc.); (b) Hispanic American studies; (c) linguistics; (d) upper division courses in other foreign language or comparative literature; (e) cross-cultural studies.
4. At least 18 credit hours in Spanish at the upper division level must be taken from the faculty of the University of Colorado at Denver.

Specific Requirements

1. A minimum of 15 credit hours in courses in literature and culture/civilization, to be distributed as follows: (a) Introduction to the Study of Literature; (b) a minimum of 3 credit hours in culture/civilization; (c) a minimum of 3 credit hours in Peninsular (Spain) literature; (d) a minimum of 3 credit hours in Spanish American literature; and (e) at least one course on the period before 1800.
2. A minimum of 9 credit hours in language skills and theory.
3. 6 credit hours in electives to be chosen from among upper division courses in Spanish.

Students seeking certification for teaching Spanish at the secondary level should take SPAN. 4960, Methods of Teaching Modern Languages, the 3 credit hours earned in that course count toward the major and are subject to the 48-hour maximum from one discipline allowed by the College of Liberal Arts and Sciences for the B.A. degree. Also, before enrolling in student teaching with the School of Education, the student must demonstrate oral and written proficiency in Spanish through an examination administered by the Department of Modern Languages. The student should see an advisor in Spanish for details.

Upon declaring a major in Spanish, each student will be assigned a faculty advisor with whom the student should consult at least once per semester thereafter. It is especially important that students have their transcripts reviewed by their advisor before enrolling in their final 30 credit hours at CU-Denver. Failure to do so may result in delay of graduation. Students considering entering graduate school, either at CU-Denver or elsewhere, should see an advisor as early as possible since admission depends largely on courses taken in the major.

Requirements for the Minor. A total of 21 credit hours beyond SPAN. 1010, including a minimum of 15 credit hours at the upper division level. At least 9 credit hours at the upper division level must be taken from the faculty in Spanish at CU-Denver. None of the required credit hours may be taken on a pass/fail basis, and no grade of less than C may be credited toward the minor. Courses taken at other institutions while a student is enrolled at CU-Denver may be applied to the minor only with departmental approval before enrollment in those courses. Each student with a minor in Spanish shall meet the distribution requirements listed below:

1. A minimum of two courses in language skills and theory at the upper division level.
2. A minimum of one course in culture/civilization at the upper division level (to assure credit for these courses, natives of Hispanic countries must consult the department before enrolling).
3. 6 credit hours in electives at the upper division level.

Graduate

At present CU-Denver offers no Spanish courses above 5999. The courses at the 5000 level are applicable to an M.A. degree in Spanish from the University of Colorado at Boulder and to a Master of Humanities degree from CU-Denver, depending upon degree plan approval by the appropriate graduate advisor.

COURSES

SPAN. 1010-5. Beginning Spanish I. Intended for students with no previous study of Spanish. Provides basic Spanish grammar, idioms, and reading comprehension for non-Spanish speaking students. Prer., SPAN. 1010 or placement by exam. Offered only during the summer term. SPAN. 1011/1021 combines both semesters of the first year, and meets the needs of highly motivated students of the language and culture. The class is conducted entirely in Spanish. Prer., no previous study of Spanish. Students having studied Spanish previously should not enroll in SPAN. 1011/1021 without first consulting a department advisor.

SPAN. 1011/1021-10. Intensive Spanish. Offered only during the summer term. SPAN. 1011/1021 combines both semesters of the first year, and meets the needs of highly motivated students of the language and culture. The class is conducted entirely in Spanish. Prer., no previous study of Spanish. Students having studied Spanish previously should not enroll in SPAN. 1011/1021 without first consulting a department advisor.

SPAN. 1020-5. Beginning Spanish II. Continuation of SPAN. 1010. Further development of listening, speaking, reading, and writing skills. Additional work in the Language Lab is required. Prer., SPAN. 1010 or placement by exam. Students having studied Spanish before coming to CU-Denver should not enroll in SPAN. 1020 without first consulting a department advisor.

SPAN. 2110-3. Second Year Spanish I. Continues the development of skills acquired in 1010 and 1020. Selective review of grammar. Readings deal with Hispanic culture and current topics from Spain and Spanish America. Prer., SPAN. 1020 or placement by exam.

SPAN. 2120-3. Second Year Spanish II. Continues the development of skills acquired in 1010 and 1020, and 2110 together with a selective review of grammar. Readings deal with Hispanic culture and literature. SPAN. 2120 satisfies the fourth semester language requirement at most graduate schools. Prer., SPAN. 2110 or placement by exam.

SPAN. 2130-3. Current Topics in the Spanish-Speaking World. A fourth semester course (parallel to 2120) designed for students majoring or minoring in International Affairs, but is open to and suitable for anyone wishing to continue the study of Spanish beyond 2110. Along with the development of language skills and grammar review, classwork involves contemporary
topics in cultural, political, economic, and social affairs. SPAN. 2130 satisfies the fourth semester language requirement at most graduate schools. Prereq. SPAN. 2110 or placement by exam.

SPAN. 3010-3. Advanced Conversation and Composition I. Expansion and reinforcement of oral and written skills in Spanish at an advanced level, in a broad cultural context. Oral activities are done individually and in groups. Topics are introduced through oral activities, and are then used for written assignments that are corrected and redrafted to develop a personal writing style in Spanish. Prereq. SPAN. 2120 or 2130, or consent of instructor.

SPAN. 3020-3. Advanced Conversation and Composition II. Continuation of SPAN. 3010. Development of oral and written skills in Spanish in preparation for taking other advanced courses. Topics of increasing complexity are selected from current publications in Spanish, and the representation of several passages from contemporary plays contributes to the development of oral skills. Prereq. SPAN. 3010 or consent of instructor.

SPAN. 3060-3. Spanish Phonetics: Theory and Practice. Theoretical and practical aspects of the sound system of Spanish. Prereq. SPAN. 2120, 2130, or consent of instructor.

SPAN. 3082-3092-6. Introduction to Translation I and II. Two-semester sequence that introduces the methodology and practice of written translation. Thorough analysis of source texts precedes translation into target language. Students must demonstrate third-year competence in Spanish and advanced writing skills in English. Prereq., upper division standing in Spanish. 3.0 grade-point average.

SPAN. 3100-3. Culture and Civilization of Spain. Taught in English, no major or minor credit. Survey of the development of Spanish civilization—the social, political, economic, religious, literary, and artistic life of Spain—within the framework of the Western tradition, and its later dissemination in the New World. Prereq., minimum of sophomore standing, or consent of instructor.

SPAN. 3112-3. Latin America: A Tradition of Conflict. Equivalent in English of SPAN. 3212, for no major or minor credit. Requires no knowledge of Spanish. Based on an interdisciplinary approach to Latin America.

SPAN. 3202-3. Culture and Civilization of Spain. Taught in Spanish for major and minor credit. Survey of the development of Spanish civilization—the social, political, economic, religious, literary, and artistic life of Spain—within the framework of the Western tradition, and its later dissemination in the New World. Prereq. SPAN. 2120, 2130, or consent of instructor.

SPAN. 3212-3. Spanish American Culture and Civilization. Taught in Spanish for major and minor credit. Survey of the social, political, economic, religious, literary, and artistic life of Spanish America from the Conquest to the present. Prereq., SPAN. 2120, 2130, or consent of instructor.

SPAN. 3252-3. Introduction to the Study of Literature. The basic terms and skills needed to analyze both the themes and form of literary works, together with an introduction to research skills. All literary examples come from Hispanic literature. SPAN. 3252 is a prerequisite (previous or concurrent) to all other literature courses taught in Spanish. Prereq. SPAN. 2120, 2130, or consent of instructor.

SPAN. 3300-3. Twentieth Century Spanish Literature. The literature of Spain from the beginnings of the 20th century to the present through short stories, poems, and plays. Prereq. SPAN. 3252 previously or concurrently.


SPAN. 3400-3. Survey of Spanish Literature I. The most important works in the literature of Spain from the early Hispanic-Arabic lyric poems through the Golden Age of the 17th century. Prereq., SPAN. 3252 previously or concurrently, or consent of instructor.

SPAN. 3410-3. Survey of Spanish Literature II. The most important works in the literature of Spain from the 18th century to the present. Prereq. SPAN. 3252 previously or concurrently, or consent of instructor.

SPAN. 3500-3. Survey of Latin American Literature I. The most important works in the literature of Spanish America from pre-Colombian times to the mid-19th century. Prereq., SPAN. 3252 previously or concurrently, or consent of instructor.

SPAN. 3510-3. Survey of Latin American Literature II. The most important works in the literature of Spanish America from the late 19th century to the present. Prereq., SPAN. 3252 previously or concurrently, or consent of instructor.

SPAN. 3520-3. Contemporary Mexican Literature. The most important trends and selected key works in various genres of Mexican literature from the second World War to the present. Prereq., SPAN. 3252 previously or concurrently, or consent of instructor.

SPAN. 3550-3. Spanish American Short Story. The Spanish American short story from its beginnings in the Romantic period of the 19th century to the present. Prereq., SPAN. 3252 previously or concurrently, or consent of instructor.

SPAN. 3560-3. Spanish American Drama. Plays from throughout Spanish America, dating largely from the beginning of the 20th century to the present. Prereq., SPAN. 3252 previously or concurrently, or consent of instructor.

SPAN. 3570-3. Spanish American Poetry. Poetry in Spanish America from Colonial times to the present. Prereq. SPAN. 3252 previously or concurrently, or consent of instructor.

SPAN. 3700-3. Spanish for International Business I. Development of proficiency in oral and written Spanish as used in business and industry throughout the Hispanic world, together with an increased awareness of social, economic, and political conditions affecting business transactions, particularly in long-term operations. Prereq. SPAN. 2120 or 2130, or consent of instructor.

SPAN. 3710-3. Spanish for International Business II. Continuation of SPAN. 3700. Further development of oral and written language proficiency, together with further examination of pertinent social, economic and political conditions of the Hispanic world. Prereq., SPAN. 2120 or 2130, or consent of instructor. SPAN. 3700 desirable.

SPAN. 3720-3. Spanish Business Documentation and Correspondence. Complementary to SPAN. 3700 and SPAN. 3710, with emphasis on the business and technical terminology used for documentation and correspondence in Spain and Spanish America. Prereq., SPAN. 2120 or 2130 or consent of instructor. Concurrent enrollment in SPAN. 3710 highly recommended.

SPAN. 3730-3. Special Topics in Spanish for International Business. Variable topics not otherwise covered sufficiently in regular courses. May be taken more than once, provided that the topic is different each time. Prereq., SPAN. 3700 or consent of instructor.

SPAN. 3830-3. Topics in Spanish Literature. Taught in English, no major or minor credit. Varying topics in Hispanic literature for students not able to read Spanish well. SPAN. 3830 may be taken more than once, provided that the topic is different each time.

SPAN. 3939-3. Geography and Travel in Spain and Spanish America. Taught in English, no major or minor credit. Requires no knowledge of Spanish. Designed to acquaint students with the geographical features of the Iberian Peninsula and Spanish America, their impact on the cultural and economic development of the region, and essential travel information. Prereq., SPAN. 2120 or 2130, or consent of instructor.
Prer., SPAN. 3252 and preferably at least one additional course in literature, or consent of instructor.

**SPAN. 4120-3. Contemporary Latin American Literature.** Major works in various genres published in Latin America since the second World War. Prer., SPAN. 3252 and at least one additional course in Hispanic literature. for SPAN. 5150: graduate standing in Spanish.

**SPAN. 4160-5160-3. Masterpieces of Spanish-American Literature.** Focuses on a limited number of outstanding works in Spanish American literature across the centuries. Prer., for SPAN. 4160: SPAN. 3252 and at least one additional course in Hispanic literature; for SPAN. 5160: graduate standing in Spanish.

**SPAN. 4220-5220-3. Mexican Literature.** Mexican literature from pre-Columbian times to the present. Prer., for SPAN. 4220: SPAN. 3252 and at least one additional course in Hispanic literature; for SPAN. 5220: graduate standing in Spanish.

**SPAN. 4300-5300-3. Generation of 1898.** Spanish literature from around the turn of the century through about the first third of the 20th century, reflecting the deep intellectual and cultural ferment occasioned in part by Spain's loss of the Spanish-American War of 1898. Prer., for SPAN. 4300: SPAN. 3252 and preferably at least one additional course in literature; for SPAN. 5300: graduate standing in Spanish.

**SPAN. 4400-5400-3. Romanticism of Spain.** The Romantic movement in 19th century Spain through plays, poems, essays. Prer., for SPAN. 4400: SPAN. 3252 and preferably at least one additional course in literature; for SPAN. 5400: graduate standing in Spanish.

**SPAN. 4410-5410-3. Modernism.** Examines the first real flowering of Spanish American literature, from about 1880 to 1910. The dominant genres of the period were the short story, the essay and lyric poetry. Readings come from Darío, José Enrique Rodó, Manuel Gutiérrez Najera, Manuel Díaz Rodríguez, and others. Prer., for SPAN. 4410: SPAN. 3252 and at least one additional course in Hispanic literature; for SPAN. 5410: graduate standing in Spanish.

**SPAN. 4500-5500-3. Nineteenth Century Spanish Novel.** The Spanish novel in one of its most productive periods, beginning with Romanticism and carrying through the Realist and Naturalist movements. Prer., for SPAN. 4500: SPAN. 3252 and preferably at least one additional course in literature; for SPAN. 5500: graduate standing in Spanish.

**SPAN. 4510-5510-3. Contemporary Spanish-American Novel.** The novel in Spanish America since the second World War, the period in which the greatest number and quality of works has been produced. Prer., for SPAN. 4510: SPAN. 3252 and at least one additional course in Hispanic literature; for SPAN. 5510: graduate standing in Spanish.

**SPAN. 4520-5520-3. Golden Age Drama.** Spanish drama of the 17th century, the period of greatest dramatic productivity in the nation's history. Readings include selections from Lope de Vega, Tirso de Molina, Calderón de la Barca, and others. Prer., for SPAN. 4520: SPAN. 3252 and at least one additional course in Hispanic literature; for SPAN. 5520: graduate standing in Spanish.

**SPAN. 4530-5530-3. Golden Age Prose: The Novel and Short Story.** Outstanding prose works and authors of the Spanish Golden Age, including the romance of chivalry, and the picaresque novel and Cervantes. Prer., for SPAN. 4530: SPAN. 3252 and at least one additional course in Hispanic literature; for SPAN. 5530: graduate standing in Spanish.

**SPAN. 4620-5620-3. Don Quijote.** The complete Don Quijote in Spanish, focusing on its historical, social, and philosophic context, and its role in the emergence of the modern novel. Prer., for SPAN. 4620: SPAN. 3252 and preferably at least one additional course in literature; for SPAN. 5620: graduate standing in Spanish.

**SPAN. 4960-5690-3. Methods of Teaching Modern Languages.** Methodology of teaching French, German and Spanish in an urban setting; required for language teachers wishing to be certified at the secondary level through the School of Education at CU-Denver. Should be taken immediately before student teaching. Normally students should have completed all other requirements for the major. Prer., for SPAN. 4960: SPAN. 5690, graduate standing in Spanish.

**SPAN. 4970/5970. Special Topics.** Varying topics in Hispanic literature not otherwise covered by regular courses. SPAN. 4970 may be taken more than once, provided that the topic is different each time. Prer., for SPAN. 4970: SPAN. 3252 and at least one additional course in Hispanic literature; for SPAN. 5970: graduate standing in Spanish.

**Independent Study.**

**SPAN. 4840-1 to 3. Independent Study (Undergraduate).**

**SPAN. 5840-1 to 3. Independent Study (Graduate).**

**MUSIC**

(See School of the Arts in the College of Liberal Arts and Sciences section of this catalog.)

**PHILOSOPHY**

**Associate Chair:** Frank H. Marsh  
**Office:** 1050 9th St.  
**Telephone:** 556-4868  
**Faculty:** Professor: Frank H. Marsh  
**Associate Professors:** Charles A. Kenevan, Glenn A. Webster  
**Assistant Professor:** Mark Yarborough  
**Adjunct:** Sharon Coggan, George Gadow, Manuel Laderman, Darryl Mehring

**Undergraduate.**

The philosophy program is recommended to those students whose goal is a liberal arts education in the finest sense. Philosophy is concerned with the most sustained and deeply reflected thoughts of human civilization, with the transmission and evaluation of basic beliefs and values. It is not an easy field of study, but for more than 25 centuries philosophy has been judged most rewarding by those who seek self-development, intellectual sophistication, and the happiness of a reflective life.

For career preparation, philosophy should be combined with other fields. It is an excellent undergraduate preparation for such fields as law and medicine.

**Requirements for the Major.** PHIL 1441, 3002, 3022, and at least one upper division course in each of the following four areas:

1. Metaphysics and/or epistemology  
2. Ethics and/or social philosophy  
3. One philosophical problem or philosopher  
4. One course relating philosophy to art, religion, science or history.

General prerequisites (which may vary for some courses) are: 1000-level — none; 2000-level — 3 hours; 3000-level — 6 hours; 4000-level — 9 hours, and 5000-level — 12 hours. The prerequisite may be waived with the consent of instructor.

**Requirements for the Minor.** A minor in philosophy requires 12 hours and is available at CU-Denver. Interested students

Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards. At present CU-Denver offers no Spanish courses above 5999. Courses at the 5000 level are applicable to an M.A. degree in Spanish from CU-Boulder and to a Master of Humanities degree from CU-Denver.
should contact a department advisor for information.

Graduate

Applicants for admission to The Graduate School for work toward an M.A. or Ph.D. degree with a major in philosophy are expected to have had 18 or more semester hours in undergraduate courses in the subject including history of philosophy. While some course work at the graduate level may be taken at CU-Denver in this discipline, all degree programs must be arranged through the University of Colorado at Boulder.

Students wishing to pursue graduate work in philosophy should note that requirements for Advanced Degrees in this catalog and those obtained from the department a copy of the Graduate Program in Philosophy. The Graduate Record Examination is not required.

Certain special programs exist (M.A. in comparative East/West philosophy and in history and philosophy of science), details of which may be had on request.

COURSES

PHIL. 1012-3. Introduction to Philosophy. Introductory study of major philosophers and problems, with special attention to theories of knowledge and reality, but also including ethics and social and political philosophy.

PHIL. 1020-3. Ethics. Introductory study of major philosophers on the nature of the good man, principles of evaluation, and moral choice.

PHIL. 1200-3. Philosophy and Society. Systematic discussion and analysis of the philosophic ideas of community, freedom, political power, the nature and role of violence, etc., together with the challenge of war, poverty, and racism to contemporary culture.

PHIL. 1300-3. Philosophy and the Physical World. An introduction to philosophy through the consideration of topics and problems related to the physical and biological sciences such as freedom and determinism; mind and body; artificial intelligence; sciences and ethics; current theories of the universe, space, time, matter, energy, causality, etc.

PHIL. 1441-3. Introductory Logic. Introduction to deductive logic, covering categorical propositions and syllogism, truth functional logic, and quantificational logic.

PHIL. 1600-3. Philosophy and Religion. An introduction to philosophy through problems of religion, such as the existence of God, faith and reason, religious language, etc.

PHIL. 1630-3. Introductory Topics in Religious Studies. These are topics in religious study as distinct from philosophy of religion. Such topics may range from comparative religion to the history of religion, to more specialized topics such as Jewish thought.

PHIL. 1700-3. Philosophy and the Arts. Consideration of philosophic questions involved in the analysis and assessment of artistic experiences and of the objects with which the arts, including the literary arts, are concerned.


PHIL. 2210-3. Modern Social Theories. Present social issues, together with theoretical analyses by communist, fascist, and democratic thinkers.

PHIL. 2600-3. Oriental Religions.

PHIL. 2800-3. A Philosophical Classic. Detailed study of one major philosophic text which illustrates a variety of types of philosophical concerns. Emphasis on techniques for analysis, discussion, and assessment of philosophical argumentation. Such works as The Republic, Leviathan, and Treatise of Human Nature.


PHIL. 3010-3. Medieval Philosophy. History of philosophy from Augustine through Scotus and Ockam, the fifth through the 14th centuries.


PHIL. 3150-3. Ethical Theory. Selected problems in classical and contemporary ethical theory.


PHIL. 3280-3. Philosophy of Education. Introductory study of major philosophies on the nature and purpose of education.

PHIL. 3300-3. Special Topics in Philosophy.

PHIL. 3350-3. Metaphysics. Study of major theories of reality, including such problems as the nature of substance, space and time, and universals and particulars.

PHIL. 3360-3. Epistemology. Study of major theories of knowledge, including such problems as the problem of perception, and the distinction between belief and knowledge.

PHIL. 3400-3. Philosophy of Science. Examination of some major concepts and problems of scientific thought—explanation, confirmation, causality, measurement, and theory construction.


Attention is given to such problems in metatheory as proofs of the completeness and consistency of systems of logic.


PHIL. 3630-3. Topics in Religious Studies. More advanced course in religious studies as distinct from the philosophy of religion. Religious studies is concerned with the development and nature of religion in its various manifestations—world religions, sacred texts, rituals, theologies, mythologies, and other beliefs and special experiences. Hence, topics in religious studies may range from detailed examination of particular religious texts, such as the Old Testament or the Koran, to comparative and historical studies of the world religions, to examination of particular themes in religious beliefs, such as mysticism or hope for afterlife, to the psychology of religion.

PHIL. 3700-3. Aesthetic Theory. Introduction to major theories of aesthetics and contemporary discussions of problems in aesthetics; i.e., the nature of art, the problem of evaluation in art.

PHIL. 3939-1.3. Internship/Cooperative Education. Designed experiences involving application of specific relevant concepts and skills in supervised employment situations. Prer. junior standing and 2.75 grade-point average.


PHIL. 4260-3. Philosophy of Law. Consideration of various views of the nature of law, its role in society, and its relation to other disciplines. Investigation of philosophical commitments which underlie and affect legal conceptions and procedures.

PHIL. 4270-3. Philosophy of History. Contemporary issues in critical and speculative theory of history, including the problems of methodology, explanation, values, and the relationship between history and social philosophy.

PHIL. 4430-3. Logical Theory. Study of problems in the philosophy of logic and mathematics beyond the metatheory in PHIL. 3440. Prer. PHIL. 1441 or 3440 or consent of instructor.

PHIL. 4460-3. Theories of Human Nature. Consideration of such problems as the changeability and definability of human nature, and the possibility of a science of human nature.
PHIL 4690-3. Senior Major Colloquium. Examination of one or more fundamental, contemporary, philosophical problems.

PHIL 4730-3. Philosophy and Literature. Examination of philosophical concepts and problems presented in works of literature.

PHIL 4812-3. Special Topics in Philosophy.

PHIL 4830-3. Existentialist Philosophies. Study of such major existentialists as Kierkegaard, Nietzsche, Buber, Camus, and Sartre.

Upper Division/Graduate Level

PHIL 4200/5200-3. Philosophical Problems and Contemporary Culture. Issues and controversies in contemporary culture, their relation to modern theories of society, and their manifestations in the arts, science and technology, education, religion, and ethics.

PHIL 4242/5242-3: Bioethics. This three-hour credit course, which requires no prerequisites, examines in detail the philosophical foundations of ethical decision making in medicine, biology, and the life sciences. The presuppositions and theoretical implications of various practices, actual and projected, will be examined. Specific areas of inquiry will include: human experimentation in death and dying, genetic engineering, genetic screening, artificial reproduction, in vitro fertilization, organ transplantation, euthanasia, responsibilities of allied health care professionals, confidentiality and truth-telling, psychosurgery, use of drugs in behavior modification, and allocation of scarce resources, etc.

PHIL 4300/5300-3: Philosophy of Mind. Consideration of the problems in the philosophy of mind, including the mind-body problem, the problem of our knowledge of other minds, the compatibility of free will and determinism, etc., and discussion of such concepts as action, intention, motive, desire, enjoyment, memory, imagination, dreaming, self-knowledge, etc.

PHIL 4750/5750-3: Introduction to Phenomenology. An examination of the contribution of phenomenology to selected topics in the theory of meaning, philosophy of mind, ontology, epistemology, through a study of such philosophers as Husserl, Heidegger, Sartre, and Merleau-Ponty.

Graduate Level

Note: All courses at the 5000 level carry the following prerequisites unless otherwise indicated: 12 hours of philosophy or consent of instructor.

PHIL 5000-3. Medieval Philosophy. Covers western philosophy from Augustine to the 14th century, in the Christian, Jewish, and Islamic traditions.


PHIL 5080-3. Ethics. Representative positions in normative ethics and meta-ethics.

PHIL 5100-3. Topics in the History of Philosophy.

PHIL 5220-3. Social and Political Philosophy. Key theories, problems, and philosophers concerned with such issues as that of human community, the relations of the individual to the community, rights and obligations, human nature, and political organization.

PHIL 5260-3. Philosophy of Law.

PHIL 5270-3. Philosophy of History.

PHIL 5340-3. Epistemology. Key contemporary theories and controversies concerning the nature, scope, and limits of human knowledge.

PHIL 5380-3. Metaphysics. Key contemporary theories and controversies concerning the nature of reality.

PHIL 5420-3. Philosophy of Science. Topics connected with development and nature of science; structure of scientific theories, testing of hypotheses. Theory of decisions in science and ethics. Basic concepts and models of abstractions in history of science.

PHIL 5480-3. Philosophy of Spinoza. Study of the philosophy of this key 17th-century continental rationalist.


PHIL 5600-3. Special Topics in Philosophy. Seminars not listed as courses in which the instructor meets regularly with three or more students to discuss special topics in philosophy.


PHIL 5700-3. Aesthetics. An analysis of the principle topics of aesthetics, including such issues as formal structure of aesthetics, the nature of critical judgments, and the status of the work of art.

PHIL 5710-3. Seminar: Comparative Philosophy. A seminar in the problems and literature of relating non-Western philosophical methods, traditions, and results to Western equivalents or para-equivalents. Required of master's degree candidates in comparative philosophy.

PHIL 5720-3. Topics in Recent Philosophy.


PHIL 5760-3. Philosophy of Whitehead. Twentieth-century synthesizer of metaphysics of experience with philosophy of nature resulting in a process philosophy which he called process organism.


PHIL 5800-3. Philosophy of Plato. One of the two giants of classical Greek philosophy, 4th century BC.


PHIL 5820-3. Philosophy of Hume. Last and greatest of the founders of British empiricism.

PHIL 5830-3. Philosophy of Kant. Late 18th-century synthesizer of rationalism and empiricism who is essential for understanding 19th and 20th century.

PHIL 6200-3. Seminar: Ethics. Intensive study of one or more topics or ethical theorists.

PHIL 6300-3. Seminar: Epistemology. Intensive study of one or more topics of philosophers concerned with the problems of human knowledge.

PHIL 6450-3. Seminar: Metaphysics. Intensive study of one or more topics or philosophers concerned with theories of reality.

PHIL 6460-3. Seminar: Phenomenology. Intensive study of one or more topics or philosophers in the 20th-century phenomenological movement.

PHIL 6620-3. Studies in Political Philosophy. A study of selected texts in political philosophy as guides to formulating the principle problems in the area and to establishing the distinctive features of political realities.


Independent Study

PHIL 4840-1. Independent Study (Undergraduate).

PHIL 5840-variable credit. Independent Study (Graduate).

PHYSICS

Chair, Geography, Geology, and Physics: Martin M. Maltempo

Office: NC 3528

Telephone: 556-3456
MAJOR REQUIREMENTS

There are several variations of a major in physics available. They are designed to suit career goals ranging from fundamental research to general education.

Track Ia—Pure Physics. Students interested in basic research or teaching in higher education need to prepare for graduate school and should take Track Ia.

- PHYS. 2311, 2321, 2331, 2341, 2811, 3110, 3120, 3171, 3181, 3211, 3331, 3411, 3811, 4810, 4820, 4951. MATH. 1401, 2411, 2421, 3020.

Track Ib—Pure Physics. This track is for those students planning to teach physical science in primary or secondary schools, and should be taken with appropriate education courses. Track Ib could also be used to prepare the student for study of theoretical physics in graduate school, if taken with suitably chosen electives.

- PHYS. 2311, 2321, 2331, 2341, 3110, 3120, 3171, 3211, 3331, 3411, 3811 plus 6 hours of electives. MATH. 1401, 2411, 2421, 3020.

Track 2—Applied Physics. Careers in applied physics, primarily in industry, are best served by Track 2.

- PHYS. 2311, 2321, 2331, 2341, 2811, 3171, 3181, 3211, 3331, 3411, 3811, 4510, 4600, 4650, 4810, 4931, 4941. MATH. 1401, 2411, 2421, 3020, 4370, C.S. 1100.

Track 3—Applied Mathematics/Physics. Track 3 is a degree in applied mathematics and physics, and should be taken by students desiring knowledge of a lot of mathematics as well as physics. It is appropriate for further study of theoretical physics in academia or for a mathematically-oriented career in industry.

- PHYS. 2311, 2321, 2331, 2341, 2811, 3211, 3331, 3411, 3811, and one 4000-level elective. MATH. 1401, 2411, 2421, 3191, 3200, 3810, 4370, 4380, 4650, 4791.

Track 4—Medical Physics. This track is seen as a bridge to a masters degree in medical physics for those interested in medical research or preparation for work in a hospital or clinic situation.

- PHYS. 2311, 2321, 2331, 2341, 2811, 3211, 3331, 3411. MATH. 1401, 2411, 2430, 2830.
- CHEM. 2031, 2038, 2061, 2068, BIOL. 2051, 2061, 2071, 2081. C.S. 1000.

All physics majors, under any option, should consult with an advisor. A degree in engineering physics also is available, in collaboration with CU-Boulder. Physics is an important component in many interdisciplinary areas, such as environment, geophysical, or energy studies. Majors in these specific areas can be arranged individually.

REQUIREMENTS FOR A MINOR

(16 credits)

- PHYS. 2311, 2321, 2331, and 2341
- PHYS. 2100 and 2200 (10 credits) at least 6 semester hours of electives, of which 3 hours must be at the 3000 level or above (6 credits).

Note: At least 6 semester hours of the above must be completed at CU-Denver. No grade below a C can be used to meet the requirements for the minor.

COURSES

- PHYS. 1000-4. Introduction to Physics. An introductory survey course for nonscientists which emphasizes the main concepts of physics. Although this course is primarily descriptive, some high school algebra will be used. The accompanying lab work is designed to illustrate the material discussed in the lectures.
- PHYS. 1052-4. General Astronomy I. The methods and results of modern astronomy (solar system, stars, galaxies, cosmology) at an elementary level.
- PHYS. 1300-2. Contemporary Topics in Physics. Covers various current topics in physics at a qualitative level. Designed primarily for students intending to major in physics, engineering, and chemistry.
- PHYS. 1332-1. Topics in Physics. Different five-week course modules dealing with various topics in physics. See current Schedule of Classes for the particular modules being offered. Designed for non-science majors to fulfill the natural science requirement.
PHYS. 3811-3. Modern Physics. Presents a study of the events and discoveries that occurred during the latter part of the 19th and the first part of the 20th centuries which led to the discovery of quantum mechanics in 1925; viz: cavity radiation, ether and special relativity, particle nature of radiation, wave properties of particles, models of the atom, and the introduction of quantum mechanics. Prer. PHYS. 2331 and Calculus II.

PHYS. 3082-3. Energy and Environment. A course in the supply and usage of energy resources and the environmental problems associated with our energy usage. Prer., one course in college science or mathematics.

PHYS. 3110-3. Methods of Mathematical Physics I. Fall. Typically covers vector analysis, coordinate systems, matrices and determinants, infinite series, and complex analysis. Prer., Calculus II.


PHYS. 3171-2, 3181-2. Junior Laboratory. Advanced laboratory in classical physics, utilizing student projects. Coreq., PHYS. 3211, 3331, or consent of instructor.

PHYS. 3211-4. Analytical Mechanics. Fall. Topics include the Lagrange and Hamiltonian formulations, the two body problem, rigid body motion, and small oscillations. Prer., PHYS. 2331; coreq., differential equations.

PHYS. 3331-4. Principles of Electricity and Magnetism. Fall. Elements of mathematical theory of electricity and magnetism, including magnetostatics, electrostatics, polarized media, direct and alternating current theory, and introduction to electromagnetic fields and waves. Prer., PHYS. 2331, Calculus III.

PHYS. 3411-3. Thermal Physics. Spring. A course covering the basic concepts of the three related disciplines of thermodynamics, statistical mechanics, and kinetic theory. Prer., PHYS. 2331.

PHYS. 3620-3. Sound and Music. This course will consider the basic nature of sound waves, the ear and hearing, and musical instruments. Although this course is mainly descriptive, some high school algebra will be used. Prer., MATH. 1010 or equivalent.

PHYS. 3811-3. Quantum Mechanics. Spring. A course in which both wave and matrix mechanics are developed and applied to selected problems in atomic physics. Prer., PHYS. 3211.

PHYS. 3933-1-3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

PHYS. 3980-3. Advanced Physics Topics. This course covers a particular topic, as announced in the Schedule of Classes. May be taken more than once for credit in different topics. Prer. PHYS. 2311 and 2331.


PHYS. 5939-1-3. Cooperative Education.

Independent Study

PHYS. 1840, 2840-1-3. Independent Study for Lower Division.

PHYS. 3840, 4840-1-3. Independent Study for Upper Division. Students must check with a faculty member before taking this course.

PHYS. 5840, 6840-variable credit. Independent Study at the Graduate Level.

POLITICAL SCIENCE

Chair: Stephen C. Thomas
Office: NC 310IC
Telephone: 556-2746
Associate Professors: Michael S. Cummings, Joel C. Edelstein, Jana M. Everett, Stephen C. Thomas
Assistant Professor: Glenn T. Morris

Political Science Advisory Board
Joan Anderman
James Ashe
Barbara Barrow
Catherine Bedard-Bayne, Head, Foreign Languages Institute of Denver
The Hon. Richard Borcherds, District Judge, Adams County Court
The Hon. Jeanne Faatz
Rabbi Stephen Foster
James Gottschalk
The Reverend Marshall Gourley
The Hon. Wayne Knox
Paula Nicholas
Reverend Stephen Papa, First Universalist Church
Paul J. Sandoval, Member, Denver School Board
Joseph Schieffelin, former Colorado Senate Majority Leader
Helen Shreves, Esq., President, Colorado Women’s Bar Association
Arie Taylor
Arthur Warner, M.D., Kaiser Permanente
Undergraduate

Political science is the study of people, power, and the public good. Looking at a variety of societies, institutions, and interpersonal situations, the discipline asks who has the power, where this power comes from, how it is used, how it promotes or impairs the public good, and how the public good is defined. Political science draws from other fields, such as psychology, philosophy, economics, sociology, and world literature. Finally, it explores the relationship between idealism and realism, between theory and practice, between political thought and personal action.

Opportunities for students with a B.A. in political science include careers in business, teaching, journalism, and government service. A political science degree also serves as good preparation for professional training in law and public administration. The students' internship experiences increase their job opportunities. Students with an M.A. in political science may find careers in such areas as business, government research and administration, and teaching at the community college level.

Requirements for the Major

Undergraduate majors must complete a minimum of 30 semester hours in political science, of which at least 21 must be upper division courses. Fifteen of the 30 hours must be taken from CU-Denver faculty. Courses are distributed among the primary fields as listed in this section, i.e., American politics, comparative politics, international relations, political theory and public law, and public administration. The majors must include the following: P SC. 1001, 1101, 3011, 4407, 4417; ECON. 2012 and 2022; and one upper division course in each of three fields—American politics, comparative politics, international relations. With faculty approval, students may earn course credit for political internships through Cooperative Education, P SC. 3939, and for individually tailored courses of independent study.

Requirements for the Minor

A student can earn an undergraduate minor in political science by completing 15 semester hours distributed as follows: one lower division course (P SC. 1001 or 1101) and four upper division courses including one each in political theory, American politics, comparative politics, and international relations.

Graduate

Requirements for Admission

Students applying for admission to the M.A. program in political science normally should present at least 18 hours of undergraduate or previous graduate work in political science, at least 3 hours of which should be at the upper division or graduate level. Deficiencies may be made up at CU-Denver by enrolling in political science courses as a non-degree student. Deficiencies usually must be made up before the student will be admitted as a regular degree student, and the work involved will be in addition to the minimum hourly requirements for the degree. The department may make exceptions to these requirements in unusual cases (for instance, where course work in related fields such as psychology, economics, and history, or practical political experience, compensate for the work deficiencies in political science). Applicants are normally expected to present an undergraduate GPA of at least 3.0. In addition to transcripts and letters of recommendation specified by The Graduate School, applicants must submit a statement of academic objectives. Standardized test scores and samples of scholarly work are not required of applicants, but will be considered if submitted.

Degree Requirements

Degree requirements are 7 graduate courses and an M.A. thesis. A non-thesis option of 11 graduate courses and a project also is available. At least 4 of the courses must be graduate seminars in political science, while as many as 3 may be independent study in political science or graduate seminars in cognate disciplines (but not more than 2 of either). Course work must include at least one graduate seminar in each of three broad sub-fields: theory, American, and foreign politics. The thesis can be an article for publication, a speculative treatise in political theory, a job-related analysis of political decision making, or a more traditional research paper.

Emphasis of the political science discipline at CU-Denver is on critical perspectives, creative teaching and writing, interdisciplinary work, experimental involvement, and cooperative research projects. Close and continuing contact among students and faculty is encouraged.

Courses

General Courses

P SC. 1001-3. Introduction to Political Science. Introduction to the study of politics, its human importance, and its relationship to social institutions. Analysis of the relationship between individual political behavior and characteristics of the political system. Development of key concepts such as power legitimacy, authority, political socialization, and revolution. Required of all majors.

P SC. 2001-1.3. Topics in Political Science.

P SC. 3002-1 to 3. Topics in Political Science. Covers different areas of politics. Can be taken more than once for credit when topics vary. Includes conference participation (1 unit).

P SC. 3011-3. Research in Contemporary Political Topics. Development of basic research skills in areas of current political controversy and conflict, such as poverty, crime, racism, corruption, censorship, and imperialism. Choice of research topics related to interests of the student. Required of all majors. Prer., P SC. 1001 or consent of instructor.

P SC. 3939-1.3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

P SC. 4002-1.3. Topics in Political Science.

P SC. 5008-1.3. Graduate Topics in Political Science.

P SC. 6008-1.3. Graduate Topics in Political Science.

P SC. 6990-1 to 3. Graduate Research Topics. Independent research in some subject of special interest to the graduate student. Subjects chosen and arrangements are made to suit the needs of each particular student. Prer., consent of instructor.


Independent Study

P SC. 4840-1 to 3. Independent Study (Undergraduate). Intended to give an opportunity for advanced students with good scholastic records, and with appropriate courses completed, to pursue independently the study of some subject of special interest to them. Subjects chosen and arrangements made to suit the needs of each student. Primarily for seniors. Prer., 15 semester hours in political science and consent of instructor.

P SC. 5840-1 to 3. Independent Study (Graduate).
American Government and Politics

P SC. 1101-3. The American Political System. General introduction to the American political system with emphasis upon the interrelations among the various levels and branches of government, formal and informal institutions, processes, and behavior. Required of all majors.

P SC. 3504-3. Race, Gender, Law, and Public Policy. Historical overview of race and gender relations in the United States and an examination of the treatment of issues of race and gender in the judicial system and public policy.

P SC. 3062-3. Power in American Society: An Introduction to U.S. Political Economy. An intermediate level introduction to the political and economic forces and structures which shape the opportunities available to the American people. Among topics included are reciprocal impacts of government and business, the federal budget, taxation, lobbying and special interest, and elections. Open to business majors in place of P SC. 1001.


P SC. 3214-3. Federal Law and American Indians. An examination of the legal and political history of the U.S. in relationship to American Indian nations. The focus will be on specific laws and Supreme Court cases in federal Indian law, with analysis given to U.S. policy. There will be some comparison with Indian policies of other countries.

P SC. 3404-3. Love, Responsibility, and Justice: An Exploration through Film. Explores issues of power distribution, social status, and economic consequences of various political systems and subsystems in the United States and around the world.

P SC. 3504-3. Law for Survival. Survey of law applicable to situations frequently encountered in America, including civil and criminal actions, negligence, intentional torts, divorce, wills, home purchase, landlord-tenant, partnership, corporate law, civil liberties. Role of the lawyer in these areas is examined.

P SC. 3532-3. The Modern Capitalist State. An examination of various models of Western advanced capitalist states: laissez-faire, pluralist, welfare state, Marxist, and postindustrial. Student research for purposes of testing the alternative models. Emphasis on the U.S. Open to business majors in place of P SC. 1001.

P SC. 3554-3. Minority Politics. An examination of the social, cultural, and economic factors which affect the political choices of ethnic minorities in the United States. Analysis of minority political action.

P SC. 3914-3. Cross Cultural Field Experience. Offers students an opportunity to study other political systems through internships and study-travel programs.


P SC. 4054-3. Public Opinion and Political Behavior. Measurement of public opinion and evaluation of its impact on governmental policy formation, including survey research techniques and field work in opinion sampling.

P SC. 4064-3. State Government and Administration. Present-day national, state, and interstate relations; constitutional development; legislative, executive, and judicial processes and problems; administrative organization and reorganization; state finances; major state services; future of the states. Special attention is given to the government of Colorado.

P SC. 4074-3. Urban Politics. Examination of the structure of political and social influence in urban areas, selection of urban leadership, relationship of the political system to governmental and social institutions. Citizen involvement in urban decision making.

P SC. 4084-3. Municipal Government and Administration. Municipalities and relationships to the states and the national government; local politics; forms of municipal government; application of ideas and techniques of public administration to management of municipal affairs; activities, e.g., planning, public utilities, law enforcement, fire protection.

P SC. 4094-3. Comparative Metropolitan Systems. Comparative analysis of the major metropolitan systems of North America and Europe; the structural environment, decision making in the bureaucracies and political groupings, governmental interaction and communication.

P SC. 4354-3. Environmental Politics. Political, legal, and economic forces in environmental law and policy. Special emphasis on air and water pollution and on threats to public and agricultural land.


P SC. 4444-3. Contemporary Culture and Politics in America. Intellectual and experiential investigation of the interplay of culture and politics in American society, as manifested in literature, social and political philosophy, psychological writings and trends, radical movements and daily behavior.

P SC. 4464-3. Administrative Law. General nature of administrative law, types of administration action and enforcement, analysis of rule making and adjudication, administrative due process, judicial review.

P SC. 4494-3. American Judicial System. Examination of the principle actors in the legal system; police, lawyers, judges, citizens. About half the course will be devoted to the study of judicial behavior especially at the Supreme Court level.

P SC. 4514-3. Black Politics. Examination of black politics in the United States; the role of black interest groups, structure and functions of black political organizations, goals and political styles of black politicians, trends and the future of black politics in the United States.

P SC. 4554-3. The Mexican American in Politics. (ETST. 4458.) Analysis of the social, cultural, and economic factors which affect political behavior of Mexican Americans. Special attention will be paid to the Mexican-American cultural heritage and to relations between Mexican Americans and Anglo Americans.

P SC. 4564-3. Political Perspectives on Women. Analysis of the political experience of women and of strategies of change.

P SC. 4574-3. Political Socialization. An examination of the processes involved as individuals develop and change their political values, beliefs, and patterns of participation over the life cycle. The conditions under which political socialization contributes to system maintenance and/or change as well as variations across genders, classes, ethnic groups, and political systems will be considered.

Graduate Level

P SC. 5018-3. Seminar: American Politics. Intended primarily for students who have had an undergraduate course in American politics, this course will be devoted to the preparation and criticism of research papers with some examination of literature in the field. Prer., graduate standing or consent of instructor.

P SC. 5028-3. Seminar: Colorado Politics. Research and problems in practical politics, with emphasis on politics in Colorado. Prer., P SC. 4034 or consent of instructor.
Comparative Politics


Comparative Politics — Western Europe. Comparative analysis of political processes in the Middle East and North Africa. Islamic political theory and its contemporary manifestation. The role of nationalism and the quest for modernity in the political development of this region. Parties and programmed modernization in transitional politics. Violent and nonviolent change.

Comparative Politics — Sub-Saharan Africa. Analysis of major types of political systems in Sub-Saharan Africa and intensive case studies of selected countries exemplifying each type.

Comparative Politics — Third World Politics. An intensive comparative examination of the political process in Africa, Asia, and Latin America. Third-World dependency on major powers and multi-national corporations. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

Comparative Politics — Western Europe. Examination and writing of research papers on selected topics of industrial democracies. Especially those of Western Europe.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of comprehensive papers on selected aspects of political development within the non-Western world. Focus on the theory of political development of the heuristic value of this conceptual framework for the comparative study of non-Western politics. Introduction to research methods and materials in this field.

Comparative Politics — Latin America. Papers and research design. An intensive case studies of selected countries in the Western Hemisphere. Writing and discussion of comprehensive papers on selected topics of countries in the Western Hemisphere.

Comparative Politics — Latin American Politics. Seminar designed to stress intensive study of the political process system in Latin America with special emphasis on the variables which affect Latin American political behavior and development. Pre/Post-SC. 4132 or consent of instructor.

Comparative Politics — The Western Hemisphere. Seminar to emphasize the role of nationalism and the impact of Western influence on the political development of the Western Hemisphere. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of analytical literature, reviews, and research papers on various aspects of political change in Sub-Saharan Africa.

Comparative Politics — Southeast Asian Politics. Discussion of current literature on political and economic development of the Japanese state, with particular focus since World War II.

Comparative Politics — South Asia. Comparative study of historical, socio-cultural, and psychological bases of political leadership. Leadership types in peasant societies, empires, and revolutionary movements. Dilemmas of democratic versus authoritarian leadership in modernizing and industrial states.

Graduate Level

Comparative Politics — Western Europe. Examination and writing of research papers on selected topics of industrial democracies. Especially those of Western Europe.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of comprehensive papers on selected aspects of political development within the non-Western world. Focus on the theory of political development of the heuristic value of this conceptual framework for the comparative study of non-Western politics. Introduction to research methods and materials in this field.


Comparative Politics — Latin American Studies. Seminar designed to stress intensive study of the political process system in Latin America with special emphasis on the variables which affect Latin American political behavior and development. Pre/Post-SC. 4132 or consent of instructor.

Comparative Politics — The Western Hemisphere. Seminar to emphasize the role of nationalism and the impact of Western influence on the political development of the Western Hemisphere. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of comprehensive papers on selected aspects of political development within the non-Western world. Focus on the theory of political development of the heuristic value of this conceptual framework for the comparative study of non-Western politics. Introduction to research methods and materials in this field.

Comparative Politics — Latin American Politics. Seminar designed to stress intensive study of the political process system in Latin America with special emphasis on the variables which affect Latin American political behavior and development. Pre/Post-SC. 4132 or consent of instructor.

Comparative Politics — The Western Hemisphere. Seminar to emphasize the role of nationalism and the impact of Western influence on the political development of the Western Hemisphere. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of comprehensive papers on selected aspects of political development within the non-Western world. Focus on the theory of political development of the heuristic value of this conceptual framework for the comparative study of non-Western politics. Introduction to research methods and materials in this field.

Comparative Politics — Latin American Politics. Seminar designed to stress intensive study of the political process system in Latin America with special emphasis on the variables which affect Latin American political behavior and development. Pre/Post-SC. 4132 or consent of instructor.

Comparative Politics — The Western Hemisphere. Seminar to emphasize the role of nationalism and the impact of Western influence on the political development of the Western Hemisphere. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of comprehensive papers on selected aspects of political development within the non-Western world. Focus on the theory of political development of the heuristic value of this conceptual framework for the comparative study of non-Western politics. Introduction to research methods and materials in this field.

Comparative Politics — Latin American Politics. Seminar designed to stress intensive study of the political process system in Latin America with special emphasis on the variables which affect Latin American political behavior and development. Pre/Post-SC. 4132 or consent of instructor.

Comparative Politics — The Western Hemisphere. Seminar to emphasize the role of nationalism and the impact of Western influence on the political development of the Western Hemisphere. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of comprehensive papers on selected aspects of political development within the non-Western world. Focus on the theory of political development of the heuristic value of this conceptual framework for the comparative study of non-Western politics. Introduction to research methods and materials in this field.

Comparative Politics — Latin American Politics. Seminar designed to stress intensive study of the political process system in Latin America with special emphasis on the variables which affect Latin American political behavior and development. Pre/Post-SC. 4132 or consent of instructor.

Comparative Politics — The Western Hemisphere. Seminar to emphasize the role of nationalism and the impact of Western influence on the political development of the Western Hemisphere. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of comprehensive papers on selected aspects of political development within the non-Western world. Focus on the theory of political development of the heuristic value of this conceptual framework for the comparative study of non-Western politics. Introduction to research methods and materials in this field.

Comparative Politics — Latin American Politics. Seminar designed to stress intensive study of the political process system in Latin America with special emphasis on the variables which affect Latin American political behavior and development. Pre/Post-SC. 4132 or consent of instructor.

Comparative Politics — The Western Hemisphere. Seminar to emphasize the role of nationalism and the impact of Western influence on the political development of the Western Hemisphere. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of comprehensive papers on selected aspects of political development within the non-Western world. Focus on the theory of political development of the heuristic value of this conceptual framework for the comparative study of non-Western politics. Introduction to research methods and materials in this field.

Comparative Politics — Latin American Politics. Seminar designed to stress intensive study of the political process system in Latin America with special emphasis on the variables which affect Latin American political behavior and development. Pre/Post-SC. 4132 or consent of instructor.

Comparative Politics — The Western Hemisphere. Seminar to emphasize the role of nationalism and the impact of Western influence on the political development of the Western Hemisphere. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

Comparative Politics — Sub-Saharan Africa. Writing and discussion of comprehensive papers on selected aspects of political development within the non-Western world. Focus on the theory of political development of the heuristic value of this conceptual framework for the comparative study of non-Western politics. Introduction to research methods and materials in this field.

Comparative Politics — Latin American Politics. Seminar designed to stress intensive study of the political process system in Latin America with special emphasis on the variables which affect Latin American political behavior and development. Pre/Post-SC. 4132 or consent of instructor.

Comparative Politics — The Western Hemisphere. Seminar to emphasize the role of nationalism and the impact of Western influence on the political development of the Western Hemisphere. Components and causes of political development and underdevelopment. Prevailing styles of political action, including the use of violence.

International Relations


Graduate Level

P SC. 5218-3. Seminar: International Relations. Primarily devoted to writing and discussion of comprehensive research papers in the field of international power politics and the attempts at controlling conflicts among nations. Introduction to research methods and materials in the field. P SC. 5238-3. Seminar: American Foreign Relations. Examination of selected methodological and substantive problems. Particular emphasis on elements of national decision making. America's adaptation to the changing world, and on opportunities for student contributions through research and discussion.


Political Theory and Public Law

of revolution and political violence. The theoretical material will be firmly couched in case situations such as western, class, colonial, urban, international, historical, racial, religious, and intergenerational violence. Development by the class of its own theoretical model.

PSC. 4827-3. Women and the Law. An examination of the role of the courts in the development of public policy toward women; how the legal system affects the economic power family roles, safety, and political participation of women.

PSC. 4837-3. Contemporary Issues in Civil Liberties. Conflicting rights of individuals and their society in several areas of civil liberties, including religious cults, free speech, sexual freedom, racial quotas, and antigovernmental actions and publications. Course will include case-law readings, guest speakers, and class discussions.

Graduate Level

PSC. 5008-3. Method and Purpose in Social Science I. (S SC. 5013.)

PSC. 5408-3. Seminar: Topics in the History of Political Thought. Selected topics, such as freedom, justice, equality, and revolution, leading to political philosophies from classical and modern political thought.

PSC. 5418-3. Seminar: Selected Political Theories. Selected political philosophies or theories in classical or modern political thought.


PSC. 5478-3. Seminar: American Constitutional Law. Intensive analysis of the most recent doctrinal developments in the areas of federal jurisdiction, federalism, separation of powers, commerce, taxing and war powers, civil liberties, civil rights, etc. Designed primarily for graduate students who intend to offer American government as a field for examination at the advanced degree. Prer. PSC. 4477-4487 or consent of instructor.

PSC. 5498-3. Seminar: The Behavioral Study of Public Law. Intensive, critical examination of theoretical and substantive literature dealing with the behavior of the primary actors in the legal system — police, lawyers, judges, and citizens. Emphasis will be on the empirical approach and quantitative methods. Research papers will be required.

PSC. 5808-3. Seminar: Conflict Behavior — The Politics of Violence. Theoretical and empirical analysis of conflict behavior with special emphasis on the explanation of political violence. Revolution, international warfare, and urban unrest is studied as forms of political violence, and the role of systematic empirical research is emphasized in the development of general theories of intergroup conflict.

PSC. 5828-3. Seminar: Political Psychology. Role of personality variables in political attitudes, behavior and system maintenance and change; human nature as a parameter; political relevance of psychoanalytic, behaviorist, existential, and social psychology; alienation, ethnocentrism, dogmatism, and aggression as political variables. Prer., consent of instructor.

PSC. 6418-3. Seminar: Political Thought. Intensive research in and presentation of selected topics intended to introduce the mature student to the broad context in which political ideas arise. Deals with classical and modern thought. Prer. PSC. 4407, 4417, or consent of instructor.

PSC. 6428-3. Seminar: Systematic Political Theory. Theories relevant to an understanding of social and political systems and behavior.

PSC. 6808-3. Seminar: The Formal Study of Power. Approaches to the conceptualization and measurement of power as a social behavior with applications to community, national, and international power systems. Various structures of political authority are studied with regard to the power relations implicit in each. Forms of economic and interpersonal expressions of power relationships also are examined.

Public Administration


PSC. 4324-3. Public Administration. Role of administration in government; trends in American public administration; techniques of management; theories of public administration.

Psychology

Chair: Janis W. Driscoll
Undergraduate Advisor: Gary S. Stern
Office: St. Cajetan's Center, Room 019
Telephone: 556-8565
Faculty: Professors: Janis W. Driscoll, Carolyn H. Simmons, Gary S. Stern
Associate Professor: Mitchell M. Handelsman
Assistant Professors: Joy L. Berenberg, Rene de la Garza, Peter S. Kaplan, James G. Nimmer, Kurt Sera-Kraiger
Adjunct: Elaine K. Miller
Emeritus: Neil G. Fahrion

Psychology Advisory Board
Norman J. Brisson, Diversion Officer, Domestic Violence Unit, City and County of Denver
Perry Butterfield, Research Associate, CU Health Sciences Center
Martha Daley, Director, Office of Child Care Initiatives, City and County of Denver
Lyda Duberstein, Communication Analyst
Janet Faves, Ph.D., Industrial-Organizational Psychologist
Marti Lee Foster, Horse Trainer
Carol J. Garrett, Ph.D., Director of Information and Evaluation, Division of Youth Services, State of Colorado
Justice Howard Kirshbaum, Colorado Supreme Court
Eugene A. Lopez, Personnel Researcher
Paul S. Sherman, Ph.D., Director of Policy Development and Training, Colorado Division of Mental Health
Priscilla Zynda, Ph.D., Clinical Psychologist

Undergraduate

Psychology is the scientific study of behavior, consisting of the following major areas of study: experimental psychology, biopsychology, developmental psychology, social psychology, learning and cognition, personality, and abnormal psychology. The requirements for the major are designed to introduce the student to the spectrum of psychology, including an early exposure to research methods and statistics. Although some specialization is possible, the faculty believes that this is more appropriate at advanced levels and that the undergraduate should have a broad background upon which to base future specialization.

The psychology major prepares students for employment and for graduate study in psychology and related fields. A program leading to the master's degree in particular applied areas of psychology is available at CU-Denver.

Requirements for the Major. Students should consult with a department advisor when they declare a psychology major. Psychology major requirements include at least 30 and not more than 48 semester hours in psychology. Of these at least 16 hours must be in upper division courses and 14 of the upper division hours must be completed at CU-Denver. No grade below C will be accepted toward the major requirements. Intermediate algebra must be included in the lower division curriculum. Specific course requirements include: PSY. 1002, 2091, and 2101; at least two biotopic psychology courses such as PSY. 3224, 3254, 4054, 4144, 4164, 4254; at least two sociotropic psychology courses such as PSY. 3205, 3215, 3305,
other institutions must complete a minimum of one advanced laboratory course such as integrative course, PSY. 4405, 4415, 4455, 4495, 4665, 4715; tal honors should consult with the Psychology Majors transferring from CU-Denver, including two biotropic and one laboratory course. Further information about the department may be obtained from department advisors or by calling 556-8565.

Graduate

The M.A. degree in psychology at CU-Denver can be obtained with a specialty in industrial/organizational psychology, research in social-personality, psychometrics and counseling, or animal behavior. Students interested in the M.A. degree should obtain information directly from the Department of Psychology. In cooperation with the College of Business and Administration, the Department of Psychology also plans to offer a dual MBA/MA degree with an emphasis in industrial/organizational psychology and human resources management.

Requirements for Admission

Students wishing to be admitted to the M.A. program should be familiar with the Requirements for Advanced Degrees. Applicants must have a baccalaureate degree from an accredited college or university. The minimum GPA is 2.75, although a substantially higher GPA is typical of successful applicants. The GRE General Test and Subject Test in Psychology are required. In addition, the decision to admit an applicant is based on letters of recommendation, relevant work or research experience, and completion of required prerequisite courses for each specialty. Both full- and part-time students are encouraged to apply.

Degree Requirements

Students are required to complete 24 semester hours of course work and either a thesis or an internship in an approved agency setting. Further information can be obtained from the Department of Psychology, 556-8565.

Courses

PSY. 1002-3. Introduction to Psychology. Introduction to the scientific study of behavior including an overview of motivation, perception, learning, personality, bio-psychology, human development, abnormal, and social psychology.

PSY. 1010-3. Psychology of Personal Adjustment. This course focuses on the application of psychological theory and research to challenges people face in their lives including stress, work, and relationships. The course is designed for people not intending to major in psychology.

PSY. 2091-3. Methods in Behavioral Science. A survey of methods used by behavioral scientists, including observation and measurement techniques, correlational studies, and experimental methods. Emphasis will be on the logic of each method and the interpretation of results. Statistical content is minimal.


PSY. 2980-1 to 3. Topics in Psychology. Study of special topics to be selected by the instructor. May be repeated for credit.

PSY. 3135-3. Organizational Psychology. A survey of the behavior of individuals in organizations. Topics include leadership and motivation theories; group dynamics; measuring, understanding and explaining job attitudes; analyzing and designing jobs; training and organizational development. Prer., introduction to psychology.

PSY. 3155-3. Industrial Psychology. Survey of the field of industrial psychology. Organizational structure, communication networks, personnel selection, training, stress, and human relations will be examined. Prer., introduction to psychology.


PSY. 3315-3. Psychology of the Asian in America. An introduction, combining lecture and discussion, of the psychological perspectives of being an Asian in America. Deals directly with aspects of mental health, problems, and approaches for the Asian-American. Some field experience will be included. Prer. 3 hours of psychology.

PSY. 3505-3. Psychology and the Law. Examines the legal and extralegal applications of psychology such as assessment of insanity and competence, psychologists as expert witnesses, accuracy of eyewitness accounts, and issues relating to employment discrimination.

PSY. 3600-1 to 3. Topics in Psychology. Study of special topics to be selected by the instructor. May be repeated for credit.

PSY. 3724-3. Developmental Psychobiology. (BIOL. 3724) Exploration of the biological influences on the development of brain and behavior. Emphasis is on evolution and development, the role of experience in prenatal and postnatal development, the ontogeny of sensory systems, learning and memory, and the biological bases of language acquisition. Prer., introduction to psychology or general biology.

PSY. 3939-1-3. Internship/Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer., junior standing and 2.75 grade-point average.

PSY. 4054-3. Physiological Psychology. The morphological, neurochemical, and physiological bases of behavior. Emphasis is on structure and function of the brain. Prer., introduction to psychology and 6 additional hours of psychology.

PSY. 4144-3. Cognitive Psychology. Introduction to the study of human cognitive processes; the development of conceptual behavior, memory, and thinking. Prer., introduction to psychology and 6 additional hours in psychology, or consent of instructor.
PSY. 4154-2. Laboratory in Cognitive Psychology. Laboratory projects demonstrating cognitive principles and behaviors. This class may be used to fulfill the advanced laboratory requirement in the psychology major. Prer. or coreq., PSY. 4144.


PSY. 4174-2. Laboratory in Perception. Demonstrations and experiments dealing with perception. Prer. or coreq., PSY. 4164. May be used to fulfill the advanced laboratory requirement in psychology.

PSY. 4224-2. Laboratory in Learning. Laboratory projects demonstrating basic principles of operant and respondent conditioning. Class meetings for discussion as well as laboratory work will be required. May be used to fulfill the advanced laboratory requirement for the psychology major. Prer. or coreq., PSY. 5224.

PSY. 4405-3. Theories of Social Psychology. General psychological principles underlying social behavior. Analysis of topics such as attitudes, group relations, leadership, conflict resolution, altruism. Prer., 6 hrs. of psychology or consent of instructor. PSY. 4415-3. Experimental Social Psychology. Readings and lectures focused on the formulation of researchable problems in social psychology. Prer., PSY. 1002 or 2101; coreq., PSY. 4445.

PSY. 4445-2. Social Psychology Laboratory. Experimental methods of studying social psychological processes. Coreq., PSY. 4415. May be used to fulfill the advanced laboratory requirement in psychology.

PSY. 4455-3. Theories of Personality. The physiological and psychological nature of personality. Individual differences. Development of personality. Prer., 16 hours of psychology or consent of instructor.


PSY. 4945-3. Psychology of Sports. Study of the application of psychology to issues in sports such as athlete motivation and crowd behavior. Covers the application of theories of learning, social psychology, and cognitive psychology.

Upper Division/Graduate Level


1Students enrolled at the 5000 level may expect additional work and evaluation commensurate with graduate standards.
PSY. 6840-1 to 6. Independent Study (Graduate). A structured experience, planned and implemented with the assistance of a sponsoring faculty member in ongoing programs of research or other scholarly activity. Prerequisite: admission to the graduate program in psychology or consent of instructor.

SOCIAL SCIENCE, MASTER OF

Director: David F. Bramhall
Telephone: 556-8540

The Master of Social Science (M.S.S.) program is designed to meet the needs of students who prefer flexibility in constructing an individualized course of study in social science. The program is intended for students interested in exploring different social sciences in order to develop their own interdisciplinary perspectives in such areas as public policy, women's issues, urban problems, educational reform, cross-cultural studies, or politics. The participating disciplines are anthropology, economics, history, political science, psychology, social or economic geography, and sociology. Course work also may be chosen from such disciplines or colleges as communication, English, ethnic studies, philosophy, education, public affairs, and architecture and planning.

Within a flexible framework of degree requirements, faculty assist students to develop coherent programs which can provide: training for advancement in the professions of education, business, the helping professions, politics, or public service; a basis for further graduate study in a specific social science discipline or professional field; a means for teachers and other professionals to tailor degree programs to fit personal career development or on-the-job needs; and a nontraditional option for adults re-entering the academic world to pursue liberal educational goals in the social sciences.

Requirements for Admission

To qualify for regular admission, applicants must meet the general requirements of The Graduate School. Applicants must have completed a baccalaureate degree or its equivalent with an overall GPA of at least 2.75 of a possible 4.0 and at least 18 semester hours of course work in social science. Three letters of recommendation and two copies of official transcripts from all colleges and universities attended must be submitted as well as a statement specifying the purpose and goal of advanced study in the social sciences written in clear, effective English. Standardized test scores and samples of scholarly work are not required but will be considered if submitted. In addition, applicants must interview with the M.S.S. director to discuss study plans. An appropriate substitute for the interview may be arranged for out-of-state applicants. An applicant whose GPA is below 2.75 may be admitted as a provisional graduate student if the complete academic record indicates a high probability of success. Applications are reviewed for fall, summer, and spring semester admission. Applications and all accompanying documents must be submitted at least three months prior to the start of the semester for which the applicant is applying. Application forms and further information may be obtained from The Graduate School at (303) 556-2663.

Foreign students should return their application materials directly to The Graduate School.

Program Requirements

The M.S.S. is a 36-hour program, of which 30 hours must meet all specifications of The Graduate School. There are two required core seminars: S SC. 5013 and 5023. A maximum of six credits may be taken for thesis credit or as S SC. 6960 to complete a research project, an internship, or a work-related project. The remaining 24 hours may be individually structured with the approval of the student's advisory committee and the director of the M.S.S. program.

There are two certificate program options within the M.S.S. program: Women's Studies and Political Economy. The same general requirements for the M.S.S. must be fulfilled, but the certificate programs have their own M.S.S. core courses and other course requirements. For further information, please contact the M.S.S. program office.

CORE COURSES

S SC. 5013-3. Philosophical Problems in the Social Sciences. Exploration into the fundamentals of the conduct of inquiry; concept formation and theory construction in the social sciences; issues related to value judgments and objectivity, social praxis, human nature, etc.

S SC. 5023-3. Theoretical and Research Perspectives in the Social Sciences. Exploration of the theoretical and research perspectives of the following disciplines: anthropology, economics, history, political science, psychology, social or economic geography, and sociology. Implications drawn for an interdisciplinary, integrated social science.

S SC. 5030-3. Seminar: Studies in Political Economy. This graduate level exploration of competing paradigms in political economy is a core seminar for students seeking a concentration in political economy and an elective for students in related graduate programs. The seminar focuses on linkages between economy, politics, and culture.

S SC. 5050-1 to 3. Feminist Topics in the Social Sciences. These topic seminars are concerned with specialized aspects of feminist studies from various theoretical and research perspectives, which are interdisciplinary, empirically grounded, and action oriented. They also serve as a forum for discussion of individual projects and peer support.

S SC. 5053-1 to 3. Topics in the Social Sciences

S SC. 5430-3. Gender as Culture. This course looks at ways in which implicit, conceptual, and value systems dictate gender-related behaviors in homes, work places, and particularly in educational institutions. Ongoing debates and issues are examined from across disciplines to give students a sense of the gender literature as well as opportunities to think through applications and implications of current work.

S SC. 6960-1 to 6. M.A. Project or Report. Research which may be based on field work.

Recommended General and Interdisciplinary Courses in the Social Sciences

The following courses do not require substantial background in a given discipline. For more advanced courses suitable for those who have somewhat more background in the discipline, see the course listing of the particular discipline. Note that courses numbered less than 5000 must be taught by a graduate faculty member, and the number of these courses taken should be limited.

ANTHROPOLOGY

ANTH. 3600. Anthropology of Sex
ANTH. 4190. Family Dynamics
ANTH. 5014. Biocultural Foundations of Health
ANTH. 5115. Urban Anthropology
ANTH. 5125. Applied Cultural Anthropology
ANTH. 5160. Language and Culture
ANTH. 5170. Comparative Social Organization
ANTH. 5546. Human Ethology
ANTH. 6020. Interdisciplinary Seminar
Sociology / 247

ANTH. 6103. Seminar: Contemporary Culture Theory
ANTH. 6120. Seminar: Comparative Social Systems
ANTH. 6140. Seminar: Research Techniques in Cultural Anthropology

ECONOMICS
ECON. 3200. Women and Economics
ECON. 4170. Comparative Socialism
ECON. 5050. Special Economic Problems
ECON. 5090. History of Economic Thought
ECON. 5190. Radical Political Economy
ECON. 5200. Modern Radical Political Economy
ECON. 5250. Urban Economics
ECON. 5530. Resource Economics
ECON. 5710. Comparative Economic Systems
ECON. 6093. Critical Evaluation of Economic Theory
ECON. 6100. The Classical and Radical Economic Traditions
ECON. 6250. Urban Economics

HISTORY
HIST. 5160. Victorian England
HIST. 5170. Twentieth Century England
HIST. 5250. French Revolution and Napoleon
HIST. 5320. Reform and Revolution in Russia, 1860-1917
HIST. 5330. Soviet Russia
HIST. 5360. The American Colonies to 1750
HIST. 5370. The American Revolution
HIST. 5410. U.S., 1900-1945
HIST. 5420. U.S. Since 1945
HIST. 5430. U.S. Foreign Policy Since 1912
HIST. 5470. U.S. Society and Thought to 1860
HIST. 5530. Women in U.S. History
HIST. 5540. The American Family
HIST. 5560. Urban America
HIST. 5570. U.S. Business History
HIST. 5610. The American Southwest Since 1800
HIST. 6920. Readings in European History
HIST. 6921. Readings in British History
HIST. 6925. Readings in U.S. History, 1865-1900
HIST. 6926. Readings in U.S. History, 1900-1939
HIST. 6928. Readings in Third World History

POLITICAL SCIENCE
PSC. 3034. Race, Gender, Law, and Public Policy
PSC. 3105. Women in a Changing World
PSC. 4216. International Politics
PSC. 4444. Contemporary Culture and Politics in America
PSC. 4564. Gender and Politics
PSC. 4625. Comparative Socialism (Cuba)
PSC. 4827. Women and the Law
PSC. 5018. Seminar: American Politics
PSC. 5098. Seminar: Urban Politics
PSC. 5118. Seminar: Political Development
PSC. 5138. Seminar: Latin America
PSC. 5159. Seminar: Political Economy of the Marxist Socialist States
PSC. 5243. Women in International Development
PSC. 5408. Seminar: Topics in the History of Political Thought
PSC. 5418. Seminar: Selected Political Theories (Marxist Theory)
PSC. 5618. Seminar: Chinese Development
PSC. 5628. Gender and Society
PSC. 5828. Seminar: Political psychology

PSYCHOLOGY
PSY. 3600. Topics: Psychology of Women
PSY. 4405. Theories of Social Psychology
PSY. 4415. Experimental Social Psychology
PSY. 4495. Cross-Cultural Psychology
PSY. 5150. Seminar in Organizational Psychology

SOCIAL OR ECONOMIC GEOGRAPHY
GEOG. 5610. Geography of Cities
GEOG. 5630. Transportation: Structure and Policies
GEOG. 5650. Location Analysis

SOCIOLOGY
SOC. 3100. Women in the Labor Market
SOC. 3160. Sociology of Divorce
SOC. 5080. Sociology of Sex Roles
SOC. 5183. Seminar: Secondary Analysis
SOC. 5210. Seminar: Human Ecology
SOC. 5220. Seminar: Advanced Population Study
SOC. 5260. Seminar: Urban Sociology
SOC. 5330. Seminar: Communities in Large Societies
SOC. 5440. Seminar: Social Stratification
SOC. 5550. Sociology of the Family
SOC. 5660. Seminar: Social Psychology
SOC. 5710. Seminar: Political Sociology
SOC. 5760. Modern Marxist Social Theory
SOC. 5770. Seminar: Sociological Analysis of Organizations
SOC. 5780. Seminar: The Sociology of Work Location
SOC. 5800. Seminar: The Sociology of Occupational Behavior
SOC. 5810. Seminar: The Professions in Society

Sociology
Chair, Anthropology and Sociology: W.I. Griffith
Office: NC 3012
Telephone: 555-3557
Faculty: Professors: Karl H. Flaming, Richard H. Ogles, Daniel J. Schler
Associate Professors: Richard H. Anderson, W.I. Griffith

Undergraduate
Sociology is the scientific study of groups, social process, and behavior. The major in sociology is designed to familiarize the student with these areas through an understanding of theory, method, and statistical procedures employed within them. Concentration is possible at the undergraduate level. However, the faculty believes the undergraduate should have a foundation in the basics of the discipline upon which to build a future specialization. Such specialization is more appropriate at the advanced levels. The major will prepare the student for such advanced work as well as for pursuit of career options with only the B.A. degree.

The department has developed the following rationale for courses offered:

1. Lower Division Courses (for majors and nonmajors)
   a. One-thousand-level courses are an introduction to the broad sociological perspective as it applies to social life, social systems, and society.
   b. Two-thousand-level courses introduce the student to somewhat more specific content areas: population study, human ecology, social psychology, etc.

2. Upper Division Courses (3000 and 4000)
   a. Three-thousand-level courses serve as advanced surveys of some specific area of concentration. They are designed to acquaint the student with the issues, methods, concepts, and theoretical frameworks employed in the content area. Such courses as urban sociology, sociology of the family, and sociology of work are offered at this level. Many of these courses are open courses in that students from other departments and colleges are encouraged to enroll in them.
   b. Four-thousand-level courses are devoted to a more detailed in-depth examination of specific issues, approaches and concepts within
the previously identified content areas. These are advanced courses and are geared more directly to sociology and social science majors.

Requirements for the Major. A major in sociology is accomplished by completing a general core of 22 hours and 12 hours of electives in sociology for a total of 34 hours with an average grade of C in all courses. At least 16 of the 34 hours must be upper division (3000-4000 level) courses. The maximum number of hours allowed is 48.

Core Courses. The core consists of the following group of courses, all of which must be completed with a grade of C or better:

- SOC. 1000-3. Introduction to Sociology
- SOC. 3001-3. Urban Sociology
- SOC. 3111-3. Introduction to Research Methods
- SOC. 3121-4. Introduction to Research Methods
- SOC. 4151-3. Historical Sociology of Theory
- SOC. 4161-3. Contemporary Sociological Theory
- SOC. 4830-3. Senior Seminar

All prospective majors should contact the department as early in their academic careers as possible for information and for assignment to the major advisor. Transfer or returning students should consult with the major advisor concerning completion of the core courses.

The department requires that at least 12 hours of sociology be taken from CU-Denver faculty. SOC. 3111, 3121, 4151, 4161, and 4830 must be taken from University of Colorado faculty.

Note: The Paralegal Certificate Program is offered in cooperation with Community College of Denver and Arapahoe Community College. Students interested in this program should talk with the major advisor about the specifics of the Paralegal Certification Program as part of the sociology major.

Requirements for the Minor. For an undergraduate minor in sociology, a minimum of 15 semester hours in sociology must be completed with a grade of C or better; 9 of these hours must be taken from CU-Denver faculty. Required courses are SOC. 1001, Introduction to Sociology, and SOC. 4151, Sociological Research (must be taken from CU-Denver faculty).

Departmental Honors. Students wishing to graduate with departmental honors in sociology (cum laude, magna cum laude, and summa cum laude) must have at least a cumulative grade-point average of 3.2 and a 3.2 or higher in sociology. Additional requirements are available in the sociology/anthropology office. Qualified students are encouraged to apply for the Honors program no later than the beginning of their senior year.

Graduate

The M.A. degree in sociology offered at CU-Denver has an urban focus with an applied emphasis. The urban sociology program is designed to complement professional degree programs in architecture and planning, medicine, nursing, community health, physical engineering, public and business administration, education, and fine arts by providing advanced seminars and planning and research opportunities in urban theory and methodology.

Requirements for Admission

1. Completion of a minimum of 25 semester hours of approved graduate work plus a thesis to meet the requirements of the Plan I option or of 30 semester hours of approved graduate work to meet the requirements of the nontesis Plan II option.
2. Sociological theory — 3 hours (SOC. 5004)
3. Research methods — 3 hours (SOC. 5035)
4. Progression of sociology — 2 hours (SOC. 5853)
5. Quantitative data analysis — 3 hours (SOC. 5183)
6. Passing of comprehensive final examination.

For further information contact the graduate director, 556-2846.

COURSES

SOC. 1001-3. Introduction to Sociology. A survey course in which the main concepts that define the sociological perspective are presented and a picture of society is provided by examining major social institutions and forms of social organization within society.

SOC. 1030-3. Analysis of Socio-Cultural Process and Personal Relations. Study of the relations between social and cultural processes in modern industrial societies and their import for patterns of social relations and personal growth and development.

SOC. 1050-3. Analysis of Modern Society. Examination of various sociological views of modern society including those of Lomberg, Mills, Goffman, Surokin, Cohen, and others.


SOC. 2010-3. Contemporary Social Issues. Consideration of controversial issues from various sociological perspectives: alienation, degradation of work, racism, sexism, ageism, class exploitation, social control, oppression and repression, imperialism, and underdevelopment. Student nomination and exploration of issues salient to him/her are encouraged.

SOC. 2020-3. Race, Gender, and Class. Race and ethnicity, facts and myths about great populations, including social and cultural sources of bias and discrimination.

SOC. 2030-3. Social Institution of the Family. The family as a social institution. Historical development and contemporary cross-cultural analysis with emphasis on the contemporary American family.

SOC. 2040-3. Social Institution of Work. The analysis of work in the contemporary organizational setting. Topics covered include formal and informal organization, unionization, job satisfaction, work place modifications, and work and the non-work world. An emphasis is placed on the changing meaning of work.

SOC. 2050-3. The Social Institution of Education. Sociological study of the techniques of education. Classroom procedures, school administration, educators' roles, and reciprocal relations of school and community.

SOC. 2060-3. The Social Institution of Religion. This course is designed to introduce the student to the fundamental tenets of the sociology of religion with a basic emphasis on present-day religious cults, their beliefs, and activities in society.

SOC. 2070-3. The Underclass and Social Policy. Informal and formal regulative processes in social behavior with reference to techniques and processes of social control such as propaganda, the political order and other institutions.

SOC. 2080-3. Sociology of the Labor Market. Attempts to review and integrate labor market research studies, job-finding advice from recognized authorities, and
findings of national employment projects. Causes of unemployment are analyzed and alternative job-search strategies are identified and discussed, with an emphasis on the Denver job market.

SOC. 2090-3. Deviant Behavior. Study of the processes by which non-normative behavior, interpersonal relations, and groups of organizations are labeled in subcultures and society.

SOC. 2100-3. Public Opinion and Popular Culture. The analysis of voting, opinion formation, mass communication, and popular taste. An examination of current applications of survey research to changing public attitudes is emphasized.

SOC. 2110-3. Divorce in American Society. Every known culture has some form of recognized divorce. This course will examine this complex marital phenomenon. Attention will be directed at assessing, among other factors, the impact of marital adjustment, family history, child custody issues, visitation rights, financial responsibilities, etc.

SOC. 2120-3. Child Socialization. Through a study of the process of teaching and learning this course explores the effects of socialization and environments on children's development. Attention is directed at the specific agencies of socialization, how they change and offer new challenges.

SOC. 2210-3. Human Ecology. Introduction to human ecological processes and organization. The course examines the adaptation of human populations to social and physical environments through spatial, technological, and social organizations.

SOC. 2220-3. Population and Societies. Introduction to the study of human populations, particularly modern urban, industrial societies. The course will study the basic elements of demography (natality, mortality, and migration) and the way these influence the structure and growth of the society as well as migration policy.

SOC. 2462-3. Introduction to Social Psychology. Study of the development and functioning of persons, especially within a group context, and the dynamics of small groups. Emphasis is on import of symbols for human behavior, development of self-concepts, and the processes of competition and cooperation in group dynamics.

SOC. 2480-3. Social Movement. Social bases and development features of such modern social and political movements as communism, fascism, liberalism, and conservatism.

SOC. 2500-3. Social Problems and Social Change. Sociological analysis of problems resulting from recent social changes, including occupational shifts and the redefinition of work; adolescent roles and responses; public responses to crime, delinquency, and mental illness; race and minority relations; community disorganization; and the effects of population growth and redistribution on underdeveloped areas.

SOC. 3001-3. Urban Sociology. The city and urban society are examined in terms of social structure, residential and institutional patterns, process of interaction, demographic processes, and patterns of growth and change.

SOC. 3012-3. Social Stratification. The relations among the concentration of income and wealth, economic organization and power, power and class phenomena in the United States.


SOC. 3080-3. Sociology of Sex Roles. Causes and consequences of sex role differentiation at the individual, group, and societal levels. Current issues related to changing norms and values concerning gender in modern society are examined.


SOC. 3100-3. Women in the Labor Market. An analysis and assessment of the current labor market for women in the Denver metropolitan area. Sociological principles are used to examine job-search strategies. Emphasis is given to those skills that women may be unaware they have.


SOC. 3121-4. Statistics. (ANTH 4051, ECON 3811). Quantitative techniques used in analyzing social phenomena. Prereq., MATH 1070 or its equivalent, or consent of instructor.

SOC. 3200-3. Sociology of Stress and Coping. The study of occurrence and consequences of stressful life events covering symptoms of illness, groups at risk, theoretical explanations, instruments of measurement, and new research with implications for socialization and personal coping.

SOC. 3220-3. Sociology of War and Peace. Examines the institutional context that results in periods of war and peace within and between macro social systems. Also examines the major issues, some historical cases and the cycles of war and peace.

SOC. 3300-3. Advanced Social Problems. Social problems are the subject of controversy. The controversy may swirl around definitions (e.g., the social net and the poverty line), around degree of seriousness, about causes, and inevitably about solutions. Controversy also centers on the proper role of the social theorist and social scientist, observer only or activist as well? While other disciplines study social problems, they are the very heart of the sociology perspective, and the wellspring of sociological inquiry.


SOC. 3420-3. Occupational Evaluation and Change. Comparison of historical and contemporary conceptions of alienation in sociology with other perspectives in an attempt to reach a fuller understanding of the contemporary situation of human beings and their potential for growth and fulfillment.


SOC. 3450-3. Communities in Society. Examines various ways of studying community behavior in metropolitan, city, and small town settings. Students will have an opportunity to apply theory to an examination of an area of their concern within the community.

SOC. 3470-3. Advanced Social Psychology. An in-depth course in social psychology viewed from a sociological perspective. Major theories and current research are examined.

SOC. 3480-3. Environment and Behavior. The examination of the influence of natural and man-made environments on human behavior and organization. The course addresses the manner in which values and behavior are affected by open space, buildings, and physical organization of the community. Space, community organization, and architecture also are examined as an extension of social values, behavior, and organization.


SOC. 3600-3. Social Relations. The course has two aims: first, to improve the student's abilities to observe, analyze, and understand his own behavior and that of others in everyday interpersonal situations; and second, to improve his ability to see the small group as a social system. The student is expected to demonstrate his abilities by effective participation in his group as well as in periodic written analyses.

SOC. 3720-3. Computers in Sociological Research. Designed for students who have had no statistics or computer background and desire the opportunity to learn how
to use the computer in sociological investigation. It will prepare students for courses in statistics and research methods.
SOC. 3939-1-3. Internship / Cooperative Education. Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Prer. junior standing and 2.75 grade-point average.
SOC. 4100-3. Social Assessment. This course will offer a broad survey of social assessment with a focus on the methodology, practice, and application. Special emphasis is given to the use of assessment in the examination of the social impact associated with development, natural resources, and energy products.
SOC. 4151-3. History of Sociological Theory. An analysis of the major contributions and determinants of earlier social analysts to present-day social thought and analysis of pertinent sociological issues.
SOC. 4161-3. Contemporary Sociological Theory. The examination of various conceptual approaches to the problems of social order, societal functioning and integration, social conflict, and social structural change by the examination of the work of contemporary sociological theorists. Prer. SOC. 4151.
SOC. 4210-3. Human Ecology: Energy and Society. A study of the distribution of human populations in physical and social space. Attention is directed to energy and productive forces as they shape and are shaped by the social organization of communities and societies.
SOC. 4220-3. Population Change and Analysis. The sociological importance of population study. Advanced demographic analysis and population theory. Natality, mortality, problems of population growth and international and internal migrations, population policy, and aspects of population planning and control.
SOC. 4230-3. City and Region. Reviews and appraises theory and research concerning the relationship of the city to its hinterland. The analysis examines institutional, demographic, and ecological patterns evolving from dynamic city-region relationships.
SOC. 4240-3. Migration. The study of national and international movement of peoples. The course will examine the conditions that result in the flow of people from one kind of area to another and between nations. The effect of such movement on both the receiving and sending communities is examined.
SOC. 4270-3. The Social Prison: Nineteen Eighty-Four and Other Futures. This course will look at Orwell's vision as well as those of Aldous Huxley and Arthur Koestler. The course will use the sociological works of Peter Berger, David Reisman, et al., to help interpret the novelists.
SOC. 4280-3. Urban Social Space. The city simultaneously attracts and repulses us. It has openness and beauty; it is also cramped, crowded, and ugly. The city provides us with freedoms undreamed of in other times and places, yet it restricts our movements and activities. This course will examine how different professionals have viewed the city with particular attention to the spaces in the city. Both social and physical spaces will be discussed.
SOC. 4290-3. Aging, Society, and Social Policy. The role of the aged in today's society. Emphasizes interrelationships of the aged with the family, community, work, retirement, and leisure.
SOC. 4300-3. Professions in Society. A focus on the role and function of the profession which includes the extent, significance, and implications of their involvement in a changing society.
SOC. 4310-3. Mental Health and Society. Mental health in historical perspective, its relation to social class and the bearing of communication and value systems. The structures of mental health services in the United States.
SOC. 4320-3. Sociology of Terminal Illness. Examines both institutional and interpersonal patterns of behavior in response to terminal illness. Varying cultural, religious and social responses to grief are considered. Special attention is given to the hospice movement and those whose helping occupation serve the terminally ill.
SOC. 4430-3. Societies in Transition. This course concerns the processes of transition from one kind of social formation to another, for example, from capitalism to socialism. It focuses on the dialectical development of forces of social change and the agents of such change.
SOC. 4490-3. Social Control. Informal and formal regulative processes in social behavior; with reference to techniques and processes of social control, such as propaganda, the political order, and other institutions.
SOC. 4500-3. Advanced Study of U.S. Social Problems. Explanation of U.S. social problems arising out of class struggle between capitalists and wage workers as expressed in the following institutional areas: control of the labor process, poverty and equality, military spending and welfare, education, criminal justice system, child care, health care, racism, and sexism.
SOC. 4510-3. Advanced Study of Social Change. Historical change of societies from one epoch to another (e.g., from feudalism to capitalism) and from one stage to another (e.g., from competitive capitalism to monopoly capital) with focus on attendant social processes such as development of the working class, the rise of the corporation, the expanding role of the state, the irrationality of growth, and economic crises and imperialism.
SOC. 4540-3. Social Mobility. Status, occupational, and income change examined from viewpoints of individual, organization, and society as a whole. Special attention to methods of analyzing change, comparative social mobility, and status equilibrium.
SOC. 4710-3. Political Sociology. The analysis of political processes in modern society with emphasis on sociological conceptions of power structure, and processes, at the community, national, and international units of analysis.
SOC. 4720-3. Advanced Study of Computers in Sociological Research. Introduces the uses of the Statistical Package for the Social Sciences (SPSS), a major computer software package used in sociological research. Course is a prerequisite for advanced Computer in Sociology seminars.
SOC. 4750-3. Bargaining and Negotiation Strategies. This course will focus on the fundamentals of bargaining and negotiation strategies in organizational settings. The analysis will be confined primarily to the social psychological perspective with some emphasis on political influence in organizations.
SOC. 4770-3. Advanced Topics in Sociology.
SOC. 4780-3. Advanced Topics in Sociology.
SOC. 4790-3. Advanced Topics in Sociology.
SOC. 4800-3. Advanced Topics in Sociology.
SOC. 4810-3. Advanced Topics in Sociology.
SOC. 4820-3. Advanced Topics in Sociology.
SOC. 4830-3. Senior Seminar. Seminar for senior sociology majors considering important concepts, issues, and problems in sociology.
SOC. 4910-variable credit. Research Practicum. Practical experiences for undergraduates in application of principles of research design and data processing to a social research problem selected by the instructor. Consent of instructor required.

SOC. 4915-variable credit. Field Experience in Sociology. Emphasizes ethnographic techniques, intensive interviewing, direct observation, and participant observation. Students will conceptualize and execute a field research project, including data collection, analysis, and a report on some ongoing social setting. Consent of instructor required.

Graduate Level

SOC. 5004-3. Proseminar in Sociology I. Systematic review of classical subject matter and issues in sociology. Restricted to M.A. graduate students in sociology or consent of instructor.

SOC. 5015-3. Proseminar in Sociology II. Contemporary sociological theory and theory construction. Restricted to M.A. graduate students in sociology or consent of instructor.

SOC. 5024-3. Seminar: Research Methods I. Problems and procedures in research design, data collection, and processing. Restricted to M.A. graduate students in sociology or consent of instructor.

SOC. 5035-3. Seminar: Research Methods II. Practical application of research design and methods and statistical techniques in a variety of research settings with a focus on student research projects. Restricted to M.A. graduate students in sociology or consent of instructor.


SOC. 5100-3. Seminar: Sociology of Assessment. Seminar concerned with methods of assessing action programs. Basic principles of research design, measurement, and administration will be applied to situations likely to be encountered when research is conducted in an action setting. Extensive case material will be utilized.


SOC. 5183-3. Seminar: Quantitative Data Analysis. A research-oriented seminar stressing the utilization of social data already collected in the test or generation of sociological theory.

SOC. 5190-3. Seminar: Deviant Behavior. Examination of current theory and research on deviant behavior with an emphasis on the relationship between deviance and patterns of social exclusion.


SOC. 5230-3. Seminar: City and Region. Advanced analysis of institutional, demographic, and ecological patterns evolving from dynamic city-region relationships.


SOC. 5400-3. Seminar: Small Group Processes. Empirical and theoretical analysis of basic forms of social interaction, including such processes as attraction, conformity, cooperation, competition, social change, etc.


SOC. 5440-3. Seminar: Social Stratification. Historical development of various systems of production of social surplus and its differential distribution among distinct social groups and the effects on social structure.


SOC. 5610-3. Seminar: Sociology of Religion. Intensive review and analysis of the fundamental tenets of religion as a social institution with emphasis on present-day religious cults, their beliefs, and activities in society.


SOC. 5710-3. Seminar: Political Sociology. Analysis of theories related to the political order from viewpoints of social structure, cultural values, and group behavior.


SOC. 5730-3. Seminar: The Urban Elderly. Intensive review and analysis of the literature and research dealing with the elderly in contemporary society.


SOC. 5760-3. Seminar: Modern Marxist Social Theory. An exposition and analysis of recent Marxist social thought. Consideration is given to modern Marxist theories of class structure, political economy, alienation, culture, and the state.


SOC. 5790-3. Seminar: Bureaucracy. An inquiry into the consequences of bureaucracy based on analysis of diverse theories concerning the functions of large-scale organizations.

SOC. 5800-3. Seminar: Occupational Behaviors. This course will be concerned with an intensive and in-depth analysis of selected occupational roles, structures, characteristics, and trends.

SOC. 5810-3. Seminar: The Professions in Society. This course focuses on the role and function of professions in the occupational world. It investigates the changing definitions of work and conflicts in the work role from the perspective of the professions.

SOC. 5820-3. Seminar: Occupational Evaluation and Change. An intensive review and analysis of the literature and research focusing on alienation in the work place that leads to redefinitions and modern evaluations of occupations.

SOC. 5830-3. Seminar: Profession of Sociology. Historical and modern review of the theoretical frameworks used in sociological inquiries; review of the current methodologies and research techniques; and an emphasis on how sociologists do what they do.
The M.S. in Technical Communication prepares students for professional careers as technical communication specialists in business, industry, education, and government. With a background that combines a theoretical perspective and practical experience, graduates of this program will be able to produce documents that clearly communicate complex, often highly technical, subject matter. They will be prepared to design, write, edit, and produce a wide range of technical documents, including manuals, reports, proposals, brochures, contracts, and regulations. The curriculum draws from the expertise of an interdisciplinary faculty in English, psychology, engineering, communication, graphic arts, and business, thus encouraging applications from students with diverse academic and professional backgrounds. The intent of the program is to produce professional writers who can identify and solve communication problems. For more information, students should contact the program director at 556-8304.

Requirements for Admission

For admission to the M.S.T.C., students must have a B.A. or B.S. degree from an accredited institution with a grade-point average of at least 3.0 and satisfactory scores on the GRE verbal and quantitative examinations. Those with little or no training or experience in technical communication may be required to take course work at the undergraduate level before completing the graduate program.

Degree Requirements

All students must complete 30 semester hours of course work, including 21 hours of required courses:

T C. 5405. Technical Communication: Writing
T C. 5505. Technical Communication: Editing
T C. 5605. Rhetorical Theory for Technical Communication
T C. 5805. Technical Communication: Graphics
T C. 6105. Special Topics in Technical Communication
T C. 6205. Research in Technical Communication
BUS. 6100. Management Information Systems

Students also must complete six elective hours in a related field such as computer science, communication, journalism, or psychology.

Students with no work experience in technical communication are required to complete a supervised practicum in a corporate setting. Students with work experience must complete a master’s thesis or master’s project.

After completing the required course work, students must successfully complete a comprehensive examination.

UNDERGRADUATE PREREQUISITE

ENGL. 3154-3. Technical Writing

Students who do not have work experience in the field of technical communication may be required to complete this course. For a complete description see the English section of this catalog.

COURSES

T C. 5405-3. Technical Communication: Writing. This course provides intensive practice in technical writing, using simulations of professional writing situations. In a workshop featuring peer criticism, students analyze diverse audience and communication problems, including those with challenging technical content. Special emphasis will be placed on the document design process and techniques of self editing. Prer., ENGL. 3154 or consent of instructor. This course also is listed as ENGL. 5120.

T C. 5505-3. Technical Communication: Editing. This course provides intensive practice in editing technical documents. Emphasis will be on contextual editing (i.e., editing parts of a document as they relate to the whole document and the communication purpose), as well as copy editing. Students will discuss the editors role, review editing strategies, and examine methods of increasing document usability and readability. Special attention is given to solving readability problems syntactically and through format and design. Students also learn to communicate effectively with typesetters and printers. Prer., ENGL. 3154 or consent of instructor; completion of TC. 5405 is recommended. This course also is listed as ENGL. 5130.

T C. 5605-3. Rhetorical Theory for Technical Communication. This course offers an examination of the principles and applications of rhetorical theory and its relationship to technical communication. Students examine the origins of traditional rhetoric, including the oral tradition and product-oriented rhetoric; and apply the theory to contemporary issues of document design. This course may be cross-listed with ENGL. 5185.

T C. 5805-3. Technical Communication: Graphics. This course instructs technical communicators in designing information that communicates visually as well as verbally. Students focus on document design, illustration, information retrieval, desktop publishing, and working with typesetters, printers, and graphic artists. Prer., TC. 5405 or consent of instructor.

T C. 5935-3. Internship in Technical Communication. The internship permits students with no previous work experience in technical communication to participate in a supervised work experience as a technical writer, editor, or other professional capacity in industry or government. The internship may not be taken by students presently working as technical communicators. Prer., completion of required course work in the M.S.T.C. degree program and successful completion of the comprehensive examination. Consent of program director is required.

T C. 6105-3. Special Topics in Technical Communication. Students examine in depth a special topic related to the study of technical communication. The specific
special topics courses vary from semester to semester but have included computer documentation, instructional design, cognitive psychology, linguistics, and organizational communication. Prereq., TC 5405 and 5505 or consent of instructor. This course may be cross-listed with ENGL 6100.

TC 6205-3. Research in Technical Communication. This course introduces students in the M.S.TC. program to bibliographical study in technical communication, research methodology, and proposal writing; it also provides direction on preparing a mini masters thesis. Students should not take this course until they are prepared to plan their internship or masters thesis. Prereq., TC 5405, 5505, and 5605 or consent of program director. This course may be cross-listed with CMMU 6013.

Independent Research

TC 5840-1 to 3. Independent Study. Students will be supervised by a member of the graduate faculty. A 3-credit hour independent study can be used to complete the masters project requirement. Prereq., TC 5405, 5505, and 5605.

TC 6950-1 to 3. Master's Thesis. Prereq., completion of required course work in the M.S.TC. degree program and successful completion of the comprehensive examination. Consent of program director is required.

THEATRE

(See School of the Arts in the College of Liberal Arts and Sciences section of this catalog.)
ARMY ROTC

Head of Program: LTC Ben R. Tilley
Office: Rectory Office Building, Room 200
Telephone: 556-3490

The Department of Military Science offers two Army Reserve Officer Training programs leading to a commission in the active Army, the Army Reserve, or the Army National Guard Forces.

Four-Year Program

The standard four-year program consists of two phases. The basic course, normally completed during the freshman and sophomore years, consists of courses in military science, officer career development, and leadership theory and management. The advanced course coincides with the junior and senior years. Subject areas include psychology and methods of instruction, tactics and unit operations, military law, history, national strategy, and army policies. Completion of a six-week advanced camp during the summer is required prior to commissioning.

Students should contact the Professor of Military Science (556-3490) for specific requirements and options available based on each student's status at the time of program entry. Students who are veterans of military service or participated in high school ROTC or similar organizations may have a portion or all of the basic course requirements waived by the Professor of Military Science.

Two-Year Program

The abbreviated two-year program consists of the same courses offered in the advanced course. However, both undergraduate and graduate students may become qualified for this program by successful completion of a six-week summer basic camp, or by completion of a specially designed compression course offered during the Spring Semester. If selected for the abbreviated program under these options, students may receive an early commission with the Reserve or National Guard while continuing their college education at the undergraduate or graduate level.

Scholarships

Army Reserve Officers' Training Corps. The Department of Military Science offers students three-year and two-year scholarships. These scholarships cover all tuition and fees, an amount for books and supplies, and they provide a tax-free monthly stipend of $100. All advanced-course students (those enrolled in upper division courses) receive the $100 stipend. Upon completion of the ROTC curriculum, students are eligible for a commission in the Reserves, National Guard, or active Army.

Both ROTC and non-ROT C students, enrolled on campus as full-time students, may compete for the three-and two-year scholarships. All scholarship benefits are tax free, and competition is open to both men and women. For more information call 556-3490, or visit the office, 200 Rectory Office Building.

Flight Training

Students selected for the advanced course may become qualified, as cadets, to participate in the Army Aviation Program. After completion of their Officer's Basic Course during active duty, these individuals will attend Flight School.

Army ROTC Course Credit

Army ROTC course credit for graduation varies with each college. Students should contact the Professor of Military Science or dean of their college to clarify the number of credit hours to be awarded.

GRFD GUARANTEED RESERVE FORCES DUTY

This program provides for a guarantee that the student's obligation upon commissioning will be fulfilled as a member of the Army Reserve or National Guard instead of active duty.

COURSES

MIS. 101-2. Introduction to Military Science I. This is an introductory course which presents the basic makeup of the U.S. Army, the special duties and responsibilities inherent in acceptance of a commission, and basic military skills.

MIS. 102-2. Introduction to Military Science II. This course continues the development of basic knowledge and skills of military subjects begun in MIS. 101.

MIS. 201-3. Introduction to Leadership and Management I. This course continues development of student's basic military skills while examining the role of the leader in formal and informal organizations. Individual motivation, attitude formation, socialization, and inter-personal communications are also covered.

MIS. 202-3. Introduction to Leadership and Management II. This course develops basic management skills in the context of the military organization while refining basic military skills necessary to enter upper division military science courses.

MIS. 301-2. Control Aspects of Small Unit Operations I. Designed to provide the student with an extensive exposure to ROTC advanced camp subject matter. Classroom and field training exercises are used to present small unit tactics, communications, military skills, and practical leadership experience.

MIS. 302-4. Control Aspects of Small Unit Operations II. Designed to provide the student with an extensive exposure to advanced camp subject matter. Classroom and field training exercises are used to expose the student to small unit tactics, communications, military skills, and practical leadership experience. Prer., MIS. 301 and consent of instructor.

MIS. 305-5. Summer Practicum. A 6-week summer practicum which will provide the advanced course cadet with the field experience and knowledge required to develop the managerial and leadership skills essential to the commissioned officer. (Advanced camp credit is optional.)

MIS. 401-2. Seminar in Officer Development I. Discusses subjects which prepare the student to make a smooth transition into the U.S. Army. Topics include customs and courtesies of the service, financial planning, promotion policy, current defense issues and the status of our military posture. Prer., completion of MIS. 300-level course requirements.

MIS. 402-2. Seminar in Officer Development II. Contains subjects designed to develop and prepare the student for com-
missioning and initial duty with the active Army or Reserve Forces; assignments, career development, military justice, and benefits of military service. Prer., completion of MIS, 300-level course requirements.

Air Force ROTC

Department Office: Folsom Stadium, CU-Boulder
Telephone: 492-8351

U.S. Air Force ROTC offers two programs leading to a commission in the U.S. Air Force upon receipt of the baccalaureate degree. Graduate students may be commissioned upon completion of 12 hours of the professional officer course and a six-week summer training program.

Standard Four-Year Program

This program is offered to full-time, regularly enrolled degree students at the undergraduate level. The program is in three parts: the general military course for lower division (freshman and sophomore) students, the professional officer course for upper division students, and leadership laboratory (attended by all students). Completion of the general military course is a prerequisite for entry into the professional officer course. Selection for the professional officer course is on a competitive basis. Completion of a four-week summer training program is required prior to commissioning.

Modified Two-Year Program

This program is offered to full-time, regularly enrolled degree students at both undergraduate and graduate levels who will have two years remaining at the University of Colorado when they enroll. Selection is on a competitive basis. Applicants should apply directly to the Professor of Aerospace Studies not later than October 15 of the fall semester immediately preceding the academic year in which they desire to enroll in the program. Those selected for this program must complete a six-week field training program during the summer months as a prerequisite for entry into the professional officer course the following fall or spring semester.

Leadership Lab

All students enrolled in AFROTC must attend Leadership Lab (one hour per week). The laboratory involves a study of Air Force customs and courtesies, drill and ceremonies, career opportunities, and life and work of an Air Force junior officer.

Air Force College Scholarship Program

Students participating in Air Force ROTC may be eligible to compete for Air Force ROTC College Scholarships. Students selected for this program are placed on grants that pay tuition, book allowance, nonrefundable educational fees, and subsistence of $100 per month, tax free. All cadets enrolled in the professional officer course receive $100 per month subsistence during the regular academic year. Students are also eligible to compete for two, two and one half, three, and three and one half year scholarships open to both men and women.

AFROTC Course Credit

AFROTC credit for graduation varies with each college. Students should contact the appropriate college or the Professor of Aerospace Studies for determination of credit.

Supplemental Courses and Language Requirements

All AFROTC scholarship students in the General Military Course must successfully complete a course in English composition before they can advance to the Professional Officer Course. All AFROTC scholarship students must also successfully complete a course in an Indo-European or Asian language prior to commissioning. All Professional Officer Course students must successfully complete a course in mathematical reasoning prior to commissioning.

COURSES

AIR. 1010-1. Development of Air Power I. One 1-hr. lect. and one 1-hr. lab. per wk. This course is a study of air power from balloons and dirigibles through the jet age; a historical review of air power employment in military and nonmilitary operations in support of national objectives; and a look at the evolution of air power concepts and doctrine.
AIR. 1020-1. Development of Air Power II. A continuation of AIR. 1010. One 1-hr. lect. and one 1-hr. lab. per wk.
AIR. 2010-1. The Air Force Today I. One 1-hr. lect. and one 1-hr. lab. per wk. This course deals with the Air Force in the contemporary world through a study of the total force structure, strategic offensive and defensive forces, general purpose forces, and aerospace support forces.
AIR. 2020-1. The Air Force Today II. One 1-hr. lect. and one 1-hr. lab. per wk.
AIR. 3010-3. Air Force Management and Leadership I. Two 1-hr. seminars plus one 1-hr. lab. per wk. An integrated management course emphasizing concepts and skills required by the successful manager and leader. The curriculum includes individual motivational and behavioral processes, leadership, communication, and group dynamics, providing the foundation for the development of the junior officer's professional skills (officership). Course material on the fundamentals of management emphasizes decision making and the use of analytic aids in planning, organizing, and controlling in a changing environment. Organizational and personal values (ethics), management of change, organizational power, politics, and managerial strategy and tactics are discussed within the context of military organization. Actual Air Force case studies are used throughout the course to enhance the learning and communication process.
AIR. 3020-3. Air Force Management and Leadership II. Two 1-hr. seminars and one 1-hr. lab. per wk. A continuation of AIR. 3010. Basic managerial processes are emphasized. While group discussions, case studies, and role playing as learning devices are employed. Emphasis on communicative skills development is continued.
AIR. 4010-3. National Security Forces in Contemporary American Society I. Two 1-hr. seminars and one 1-hr. lab. per wk. This course is a study of U.S. National Security Policy which examines the formulation, organization, and implementation of national security policy; context of national security; evolution of strategy; management of conflict; and civil-military interaction. It also includes blocks of instruction on the military profession/officership and the military justice system. This course is designed to provide future Air Force officers with background of U.S. National Security Policy so they can effectively function in today's Air Force.
AIR. 4020-3. National Security Forces in Contemporary American Society II. Two 1-hr. seminars and one 1-hr. lab. per wk. A continuation of AIR. 4010. Special themes include defense strategy and conflict management, formulation/implementation of U.S. defense policy, and organizational factors and case studies in policymaking, military law, and uniform code of military justice.
The Graduate School of Public Affairs

Dean: Marshall Kaplan
Office: NC 5002
Telephone: 556-2825
Director, Criminal Justice (MCJ): Mark R. Pogrebin
Director, Master of Public Administration (MPA): Franklin J. James
Director, Doctor of Philosophy in Public Administration (Ph.D.): E. Samuel Overman
Faculty: Professors: Marshall Kaplan, Franklin J. James, Mark R. Pogrebin, Eric D. Poole
Associate Professors: Peter G. deLeon, Mark A. Emmert, Robert W. Gage, Thomas W. Granneman, Roy Green, Dail A. Neugarten, E. Samuel Overman
Assistant Professor: Lloyd Burton
Emeritus: Floyd C. Mann, Michael S. March, Leo C. Riethmayer

The Centers Advisory Board
Leland J. Alpert, Alpert Corporation
John E. Arnold, E-470 Authority
Robert G. Boucher, United Banks of Colorado
Thomas E. Cronin, Colorado College
John Fahrenkrog, Fuller & Co.
Richard C. D. Fleming, Greater Denver Chamber of Commerce
E. Gordon Gee, University of Colorado
Tom Glass, Western Land Exchange
The Hon. Regis Groff, Colorado State Senate
Paula J. Herzmark, Prime Time Cable Corporation
Marshall Kaplan, University of Colorado at Denver
Gail H. Klapper, Moye, Giles, O'Keefe, Vermicic & Carroll
Robert F. Leduc, Institute for Nonprofit Organization Management
The Hon. Jim Lee, Colorado State Senate
The Hon. Al Meiklejohn, Colorado State Senate
R. Garrett Mitchell
James E. Monaghan, Monaghan and Associates
Quigg Newton, Davis, Graham & Stubbs
James A. Null, University of Colorado at Colorado Springs

James G. Nussbaum, Price Waterhouse
The Hon. William F. Owens, Colorado House of Representatives
The Hon. Federico Peña, City and County of Denver
Leonard M. Perlmutter
Dean Punke
The Hon. Gail Schoettler, Colorado State Treasurer
Dwight Smith, University of Denver
Donald L. Stevens, University of Colorado at Denver
Solomon D. Trujillo, U.S. West
E. Robert Turner, State Board for Community Colleges
Wellington E. Webb, City and County of Denver

INFORMATION ABOUT THE SCHOOL

The Graduate School of Public Affairs (GSPA) at CU-Denver is a unique institution in a unique setting. Located in the urban center of the Rocky Mountain West, its goal is to raise the level of professionalism as well as the concern for equity and efficiency of the public sector through the training of well-qualified managers and public-policy decision makers. GSPA is rapidly becoming one of the top public policy and public administration schools in the nation. As former Governor Richard Lamm notes, "If someone were to ask me where the cutting edge of thinking is being applied to state and local government issues, I'd answer: 'take a look at what GSPA is doing.'"

The School provides graduate degree programs in the fields of public administration and criminal justice, including the Master of Public Administration (M.P.A.), the Master of Criminal Justice (M.C.J.), and the Ph.D. in Public Administration. Students in the public administration program may elect to focus their studies in the fields of public management or public policy. Qualified students also may choose the Executive Option for senior managers and policy makers.

The academic requirements for both the master's and Ph.D. programs are intellectually rigorous. Combined with opportunities for students to work on live regional, state, and community problems in GSPA's Centers — the Center for the Improvement of Public Management, the Center for Public-Private Sector Cooperation, and the Center for Health Ethics and Policy — these programs present students with a solid background in theory and practice. GSPA's emphasis on exposing students to real world experiences has won the school national recognition. John Parr, director of the National Municipal League’s Citizen’s Forum on Self-Government indicates that, “Probably no school of government in the nation offers as extensive a program of practical exposure to the inner workings of state and local government as the University of Colorado’s Graduate School of Public Affairs.”

A significant part of GSPA’s student population is already well established in the public sector — the average student is in the mid-30s, functioning in a middle management capacity. Many students are city managers, heads of local or state government agencies, or government relations specialists with private corporations.

As a result, the students benefit not only from the exchange of ideas with the GSPA faculty, but from the interplay with each other. For students without public sector experience, access to a large number of experienced professionals offers a fast-track exposure to the issues and challenges currently facing the public manager.

The Graduate School of Public Affairs is accredited by the National Association of Schools of Public Affairs and Administration's (NASPAA) Peer Review Committee and is listed on the Annual Roster of Accredited Programs in conformity with National Association of Schools of Public Affairs and Administration standards. The School holds membership in the Colorado Municipal League and NASPAA. Additionally, GSPA offers the Master of Public Administration to students in Western Colorado through a unique cooperative agreement with Mesa College in Grand Junction.

Functions of the School

The principal functions of the School are to provide programs of professional education, training, and service for the public sector and to undertake research...
on issues of concern to federal, state, and local governments.

The School provides an opportunity for selected working men and women to enhance their capabilities and potential for executive and managerial leadership in the public sector. It also offers students interested in the private and nonprofit sectors opportunities to improve their understanding of interorganizational relations and of strategies necessary to forge public-private sector partnerships.

Goals of the School

Some of the goals that guide the development of the School are listed here in order to give prospective students an idea of the environment in which they will be studying. The School endeavors to:

1. Provide students with a balanced understanding of theory and practice concerning public sector management and public policy issues.
2. Prepare recent college graduates having such diverse majors as anthropology, psychology, economics, sociology, biological sciences, business administration, engineering, political science, etc. for public service positions and to provide options to mid-career specialists (including retired military personnel or veterans) desiring job mobility and advancement.
3. Prepare students for private sector jobs directed at developing public-private sector partnerships.
4. Afford students an opportunity to link their background in such diverse areas as engineering, science, and public health to policy analysis and to administrative management skills.
5. Devote special efforts to enroll full- and part-time students from the ranks of those now under-represented in responsible policy and management positions in public service: women, blacks, Hispanics, and native Americans.
6. Expose students to a faculty representative of a uniquely qualified group of scholars and practitioners.

Admission Requirements

1. A baccalaureate degree from a college or university of accredited standing, with a minimum grade-point average of 2.75 for the M.P.A., M.C.J., and 3.0 for the Ph.D. Two sets of official transcripts of undergraduate and graduate work are required.
2. Three recommendations from qualified references are to be submitted on forms which the applicant will receive when he or she requests an application package. (Recommendations may be by professors, employers, and/or others who are acquainted with the prospective student's professional work.)
3. A satisfactory score on the aptitude test of the Graduate Record Examination (GRE), the Graduate Management Aptitude Test (GMAT), or the combined MAT/DOPPELT examination. Information about the examination may be obtained from the CU-Denver Testing Office, 556-2861.
4. Completed credentials should be received by June 1 for the fall semester, November 1 for the spring semester, and April 1 for the summer term to participate in CU-Denver's mail registration. The application deadlines for the Ph.D. program are November 1 for the spring semester and April 1 for the fall semester.
5. Under special circumstances a student may be admitted on provisional status for a specified probationary period. At the end of this period, the student's faculty advisor, in consultation with other faculty members, will review the student's performance and recommend whether the student should be admitted to regular degree status.
6. Students who have missed the deadline for the upcoming semester may register as non-degree students. Twelve hours may be applied to the master's degree programs if the courses apply and are approved by an advisor. Non-degree student application forms are available in the Office of Admissions and Records.
7. All application materials and test scores should be sent to Graduate School of Public Affairs, University of Colorado at Denver, 1200 Larimer St., Denver, CO 80204-5300.

Financial Assistance

Students in the master's degree programs are eligible for several types of financial assistance. Work-study positions and educational loans require application to the CU-Denver Office of Financial Aid. A number of students secure internships or other part-time positions with local, state, and federal agencies in the Denver metropolitan area. The Philip Klutznick Fund provides loans to low-income students.

The School receives a small number of fellowships from various government organizations and actively seeks additional funding for student support in the form of internship positions and research assistantships.

Veterans' benefits are also available consistent with the applicant's status and federal legislation.

A limited number of awards to support doctoral dissertation research has been available from such federal agencies as the Office of Personnel Management and the Law Enforcement Assistance Administration.

Persons interested in applying for financial assistance should inquire in the Graduate School of Public Affairs office.

Transfer of Credit

Up to 9 semester hours of appropriate graduate work from an accredited college or university and/or from a Department of Defense-sponsored school (e.g., Industrial College of the Armed Forces, Command and General Staff School, Army War College, Naval War College) may be credited toward all master's degrees. D.O.D. courses must be recommended by the American Council on Education.

Time Limit

Master's degree students must complete all course work and degree requirements within six years from registration for their first course.

Career Expectations of Graduates

While it would be difficult to predict all of the kinds of careers graduates of this School will pursue, several major categories can be defined. In the past, those who have earned graduate degrees have filled a variety of administrative positions in federal, state, and local governments, in non-profit organizations, and in the private sector. With the initiation of new programs and the addition of new faculty, some of the principal categories of career opportunities are:

1. Generalist public executives, represented by such positions as city manager, assistant city manager, director of administration, department head, assistant administrator, and administrative assistant.
2. Specialists in such fields as urban affairs, policy analysis and/or implementation, administrative planning and analysis, financial management, public-private sector partnerships and public health.
3. Career-oriented persons who are involved in the management and analysis of government or public-private sector programs. Examples would include analysis or direction of human services, environmental protection, urban planning, and natural resource programs; public works administrators; criminal justice planners and administrators; and analysts and administrators of cultural and artistic programs.
4. Teachers, lecturers, and professors of public administration and public policy in undergraduate or graduate colleges or university political science, public policy, or public management programs.

SPECIAL CENTERS, INSTITUTES, AND PROGRAMS

The Centers

The Graduate School of Public Affairs coordinates three centers — the Center for the Improvement of Public Management, the Center for Public-Private Sector Cooperation, and the Center for Health Ethics and Policy. The centers provide students and faculty with opportunities to engage in strategic multidisciplinary policy research, secure internships, and develop and participate in training and technical assistance programs. The objective of the Centers is to help the public and private sectors respond to growth and revitalization programs. Their respective programs help translate classroom education into real world public policy and public management experiences.

Center for the Improvement of Public Management. This center focuses on efforts to increase the planning and management capacity of state, county, and local government officials and staff. Its functions are oriented toward developing public sector management and analytical skills.

Center for Public-Private Sector Cooperation. Activities are directed toward increasing understanding between the public and private sectors. Its agenda is aimed at fostering a range of collaborative efforts between state/local government and private firms.

Center for Health Ethics and Policy. The newest of GSPAs centers conducts policy research on health issues, studies the ethical problems surrounding areas of health policy, and provides technical support to those addressing these problems in the state and nation.

National Leadership Institute on Aging. Funded by the U.S. Administration on Aging, Department of Health and Human Services, and private foundations, the National Leadership Institute on Aging is a nationally recognized training facility devoted to providing residential leadership development programs. Participants are persons from throughout the country who are responsible for planning and coordinating state and local social service programs for the elderly. The Institute's purposes are to assure improved policies and programs for the needy elderly, enhanced community resource allocation decisions for the elderly and non-elderly alike, and innovative service programs capitalizing on the combined energies and resources of the public, private, and nonprofit sectors.

The First Amendment Congress, a prestigious national organization committed to increasing public understanding of the First Amendment to the United States Constitution, is headquartered at the GSPA. The GSPA is proud to have stewardship of the First Amendment Congress and assist in the mission of the organization to explore issues associated with the First Amendment and promote education about the freedoms defined in this Amendment. Applied research and information dissemination on the Amendment focus on extending awareness and understanding of the First Amendment.

Each center initiates round tables and seminars, offers technical assistance, and conducts policy analysis. The Denver Partnership, Inc., and the Greater Denver Chamber of Commerce and their business leadership, collaborates with the CPPSC in a unique joint venture between the business community and the University. The centers were initiated with support from the Piton and Gates Foundations. Programs of the centers include:

- Rocky Mountain Program. A 10-day residential seminar designed to offer leadership and analytical skills to mid- and upper-level officials from state and local government.
- Rocky Mountain Management Series. One- and two-day skill-building seminars tailored to the needs of state and local government entities.
- Denver Community Leadership Forum. A 10-month program designed to provide leadership and problem-solving skills for a group of community leaders from the public sector, neighborhood and nonprofit groups, and business.
- Western Institute for Police Administration. A management training program for law enforcement officials.
- Mediation and Facilitation Program. A continuous program to help public and private sectors resolve community development conflicts and foster cooperative endeavors.
- Applied Public Policy Research. Research provided on public policy issues spanning the range from evaluations and training needs assessments to fiscal/economic impact analyses and policy studies.

Management Certification Program

GSPA has, and will continue to administer, a number of unique certificate programs aimed at increasing the professional skills and capacity of state and local government staffs. Graduate credit is offered on a limited and strategic basis when certificate courses go beyond training and meet graduate school academic standards. Generally, MCP courses or curriculum are open as electives to GSPA students. They include:

- PAD 6121. Behavioral Foundations of Management
- PAD 6122. Supervision and Human Resource Development
- PAD 6123. Fiscal Management and External Relations
- PAD 6124. Program Management

Participants in the MCP program, as well as GSPA students electing to take MCP courses, may receive up to eight credit hours.

Herrick S. Roth Lecture Series

The Graduate School of Public Affairs administers the Herrick Roth Lecture Series. This endowed program brings to the campus outstanding public policy leaders for seminars with students.

MASTER'S DEGREE PROGRAMS

The M.P.A. and M.C.J. degree programs combine core courses to provide background and elective courses to serve each student's professional interest. An internship is required for students without prior governmental experience. A description of the M.C.J. program follows the Ph.D. in Public Administration portion of this section.

The objectives and requirements of the Graduate School of Public Affairs should be read carefully by all applicants to the School.

Master of Public Administration

The degree Master of Public Administration (M.P.A.) is designed to provide graduate professional education for men and women who wish to prepare themselves for administrative or policy development careers in government service — local, regional, state, and national — or in nonprofit and private sector organizations concerned with government affairs. The program also offers to those
already in the public service an opportunity to pursue additional education as a means of furthering their careers. In addition to the courses offered by the Graduate School of Public Affairs, cooperating departments and schools of the University offer courses and seminars which may be included in the degree plans of graduate students who major in public administration.

Master of Public Administration — Executive M.P.A. Option

The Executive M.P.A. Option within the M.P.A. program is specifically designed to provide senior officials and managers education and training that improves their skills and abilities. They receive the degree, Master of Public Administration, just as regular M.P.A. students do, but they have greater flexibility in course selection than do regular M.P.A. program students. Admission to the Executive Option is highly competitive with emphasis placed on demonstrated senior level experience and potential for continued success.

In order to apply, applicants need to complete an application form, submit complete official transcripts of all college study, submit at least three letters of recommendation, submit a current resume, and pay an application fee. All materials are available from the GSPA office. Executive M.P.A. applicants are not required to take an aptitude test.

In recognition of the significant experience senior administrators bring to the program, the total credit hour requirements for the Executive M.P.A. Option are reduced by 9 credit hours to a total of 36 credit hours. Students also are allowed broad discretion in the selection of their courses. They are not required to follow the core or track course requirements. Instead, students in the Executive M.P.A. Option are required to develop an individualized program of study in collaboration with their advisor. There are only two required courses for students in the Executive M.P.A. Option: PAD 5010, Fundamentals of Public Administration for the Executive M.P.A., and PAD 6600, The Executive M.P.A. Project. The Executive M.P.A. Project is completed after students have finished, or nearly finished, their course work. The Project requires the conduct of original applied research addressing a policy or management issue that the student selects.

**DEGREE REQUIREMENTS**

The minimum requirements for the basic M.P.A. degree are outlined below. Occasionally changes are made; students may graduate under the requirements which were in effect when they were admitted.

Present minimum requirements for the M.P.A. include:

1. The completion of a minimum of 45 semester hours of graduate work with a grade-point average of B or better. A grade of B- or better is required in all core and track courses. At least 39 semester hours of this work must be at the 5000 level or above. Preserve students are required to take an additional 3 semester hours of field study (PAD 6910), bringing their minimum to 48 semester hours.

2. Completion of the following common core courses or acceptable equivalents:
   - PAD 5010, Fundamentals of Public Administration
   - PAD 5020, Statistics for Public Administration (this particular requirement can be waived for students who pass a competency examination in statistics, but completion of the minimum 45 semester hours is still required).
   - PAD 5030, Public Management: An Introduction
   - PAD 5040, Research and Analytic Methods in Public Administration
   - PAD 5050, Economics of the Public Sector (this requirement may be waived if the student has completed comparable graduate or undergraduate work); and
   - PAD 5060, Public Finance.

3. Completion of M.P.A. qualifying examination. It is to be taken after a student completes the common core courses and before completion of 24 hours of course work. Students generally must pass this examination before engaging in the track courses. Students have two opportunities to complete this requirement.

4. All students, upon completing the core courses and passing the qualifying examination, must declare a track major (either the Public Management track or the Policy Analysis and Evaluation track). Students must take the following courses based upon their selection of tracks.

   **Public Management Track Required Courses:**
   - PAD 5210, Organization Theory and Administrative Behavior
   - PAD 5220, Human Resources Management
   - PAD 5260, Advanced Seminar in Public Management

   **Policy Analysis and Evaluation Track Required Courses:**
   - PAD 5310, Public Policy Formulation and Implementation
   - PAD 5320, Public Policy Analysis and Evaluation

5. In addition to the three required track courses (see #4 above), students must take three courses from the following pool of track courses. Students in the Public Management track may select from Public Policy courses from this pool, and vice versa:
   - PAD 5210, PAD 5220, PAD 5230, PAD 5240, PAD 5250, PAD 5310, PAD 5320, PAD 5330, PAD 5340, PAD 5350, and PAD 5630.

6. PAD 6910, Field Study in Public Administration. Students who have not had government experience are required to complete PAD 6910. Enrollment in the field study may be during the summer months or during the academic year. Interns must meet their on-job requirements and also the requirements of the Graduate School of Public Affairs. A minimum of 240 hours of supervised work and study is required to earn 3 hours of academic credit.

7. The completion of three additional elective courses (9 semester hours) to be selected with the approval of a faculty advisor.

**PROFESSIONAL ORGANIZATIONS**

Students in public administration are encouraged to become members of the American Society for Public Administration and the Association for Policy Analysis and Management and to utilize the publications and other services of these professional organizations. The monthly meetings in Denver of the Colorado Chapter of the ASPA provide students with the opportunity of associating regularly with professional administrators from all levels of government.

**The B.A./M.P.A. Degree**

The Graduate School of Public Affairs has added a joint B.A./M.P.A. degree with the College of Liberal Arts and Sciences. This program strives to develop both professional and intellectual skills. It is designed to enable qualified students to earn a bachelor's degree from the College of Liberal Arts and Sciences and the degree Master of Public Administration from the Graduate School of Public Affairs in five, rather than the normal six, years. Students who wish to pursue this joint degree program should decide as early as possible in their academic careers and plan their course work carefully as they must fulfill the requirements for gradu-
tion from the College of Liberal Arts and Sciences and follow the normal admissions procedures for the M.P.A. (including satisfactory completion of the GRE or the GMAT or the combined MAT/DOPPELT examination).

The Western Slope Program

The Western Slope Program of the GSPA provides M.P.A. course offerings to public administrators in small and rural communities of western Colorado. This program is offered in conjunction with Mesa State College. It is designed to develop and integrate academic and applied experiences necessary to be an effective, modern manager in the public and non-profit sectors. The courses are offered on an intensive basis on weekends on the Mesa State campus in Grand Junction, and emphasize the needs of small and rural communities. Students accepted in the Western Slope Program are considered fully admitted to the M.P.A. program of the Graduate School of Public Affairs, and fulfill the same core and track courses for a total of 45 semester hours.

The Internship Program

An internship for the Master of Public Administration program is required for students who have not had significant public sector experience. The purpose of the internship is to continue the linkage between theory and practice that is the philosophical basis of GSPA.

The internships generally involve part-time work during the academic year, or full-time during the summer months. A maximum of three academic credits will be awarded for internship service.

Great care is taken by the dean and the faculty at GSPA to ensure that the internship meets the intellectual needs of the student. Placements have included the Governor's Office, Colorado State Legislature, Denver Mayor's Office, City of Denver, City of Lakewood, City of Aurora, Western Governor's Association, and the Denver Center for the Performing Arts.

Limitation of Course Load

The normal course load for a full-time student is 9 semester hours. A student who is employed full time may not carry more than 9 hours unless an excess load has been approved in advance by the faculty advisor.

DOCTOR OF PHILOSOPHY IN PUBLIC ADMINISTRATION

A program of professional graduate study leading to the Doctor of Philosophy in Public Administration is offered by the Graduate School of Public Affairs. The program, based on the Denver campus, permits work to be taken on any campus of the University if it is part of the approved program of study or degree plan.

The doctoral program was developed to meet the strong demand for the services of people who exhibit competence in the theory, concepts, and research skills of public administration, and who are able to use them in a variety of applications. The overall purpose of the doctoral program is to add to the ranks of those who are able to increase knowledge about complex public administration systems, organizations and environments, and public policy issues and concerns as well as to influence the policy process. The thrust of the program is to develop the conceptual, epistemological, research, analytic, and leadership skills of its students so that they will be able to advance the study and practice of public administration, broadly defined, in their subsequent careers. The Ph.D. is designed to prepare professionals for expanded leadership responsibilities in academia, senior management, senior research, and senior public-policy roles. Accordingly, the Ph.D. integrates theory and practice and stresses skill development, along with theoretical, conceptual, methodological, and contextual knowledge development.

Participants

The doctoral program is primarily designed to serve (1) people who desire to further the field of public administration through teaching and research; (2) scholars-practitioners working in government, private sector organizations concerned with government, and non-profit organizations who seek to improve their performance in or to move into positions that are concerned with strategic management and broad policy issues; and (3) professional and technical people (attorneys, public health professionals, court administrators, and others) — whether in the public, private, or nonprofit sector — who desire additional training that will enable them to participate more effectively in the process of administration, management, and policymaking at the highest levels.

Time Required for Ph.D. Degree

The Ph.D. program requires intensive commitment. It is designed to link advanced education, research and training with the practice of public management and policy development. Accordingly, most courses and seminars are offered during the evening hours, on weekends, or on an intensive basis. Anyone starting a Ph.D. program with a master's degree in public administration can expect to take at least three years to complete all of the requirements for the Ph.D. Any student entering the program with no prior graduate work in public administration should expect at least one additional year of course work.

Admission Requirements

It is desirable that a student have a master's degree in at least one related field before undertaking doctoral work. If a student does not have an M.P.A., he or she will in most cases have to take some M.P.A. course work and meet threshold M.P.A. degree knowledge. Standard GRE, GMAT, LSAT, or MAT/DOPPELT scores are required. It is desirable that entering students have at least three years of responsible administrative experience in a government agency, quasi-public institution, or not-for-profit organizations. Substitutes in the private sector are possible, particularly if they reflect positions of senior management responsibility.

SELECTION CRITERIA

Admission to the program is based on the personal and professional qualifications of the applicant. It also reflects the objectives of the GSPA faculty to achieve a productive and stimulating balance between academic background and achievements and relevant professional backgrounds, interests, and experience of students. Basic eligibility for admission is premised upon the following considerations:

1. Formal academic record and visible achievements concerning scholarship.
2. Graduate Record Examination or similar scores.
3. The depth and breadth of the applicant's professional work experience.
4. Potential for career advancement and capacity to contribute to the overall academic program.
5. Potential to benefit from an integrative classroom/work experience.
7. Personal interviews.
APPLICATION PROCESS

Applicants must submit the following items to the GSPA office before they can be formally considered for admission:

1. Application forms (available from GSPA).
2. Official transcripts for all undergraduate and graduate work.
3. Graduate Record Examination scores (GMAT, LSAT, or MAT/DOPPELT equally acceptable).
4. Current resume or vita.
5. Minimum of three letters of recommendation from colleagues and previous professors, focusing on potential for (a) future executive leadership and (b) deriving benefit from the Ph.D. program.
6. A 500-1,000 word statement of educational and career goals.

In addition, a student may submit samples of research reports or publications. All application materials will be retained by GSPA and will not be returned.

Degree Requirements

The Ph.D. program consists of a minimum of 90 credit hours of appropriate course work beyond the bachelor's degree. Master's level course work for a maximum of 30 hours can be transferred in or taken at GSPA. An additional 30 hours of appropriate doctoral level course work must be taken at the University of Colorado. Finally, 30 hours are required for dissertation credit.

PREREQUISITE COURSES

All students must have the following prerequisite courses, parallel courses offered on the Colorado Springs campus of the University of Colorado, or their equivalent (i.e., comparable course work taken elsewhere as determined by the Ph.D. director):

P AD. 7020. Statistics for Public Administration
AD. 7040. Research and Analytic Methods in Public Administration
P AD. 7050. Economics of the Public Sector
P AD. 7060. Public Finance
P AD. 7210. Organization Theory and Administrative Behavior
P AD. 7220. Human Resources Management
P AD. 7230. Governmental Budgeting

COMMON COURSES

All Ph.D. students must take the following courses:

P AD. 8010. Doctoral Seminar on the Discipline and Profession of Public Administration
P AD. 8020 or 8030. Doctoral Seminar on Public Management or Public Policy
P AD. 8060. Doctoral Seminar on the Conduct of Empirical Inquiry
P AD. 8070. Advanced Research Seminar

METHODOLOGICAL AND LANGUAGE PROFICIENCY

All students must complete (or test out of) 6 graduate credits in a specific methodology. See Ph.D. director for details.

Ph.D. CURRICULUM

The program has two tracks: public management and public policy. An individualized track will be considered with the specific approval of the Ph.D. director. Within each option, a student is required to have a concentration in a substantive, management or policy analysis area.

All students must pass preliminary and comprehensive examinations before they can be admitted to candidacy.

First, they must pass a preliminary examination in general public administration and policy. This examination covers the entire field of public administration and will not necessarily be limited to the content of the required courses. Ph.D. students must pass their qualifying examination before they can take the comprehensive examination.

Second, they must choose an option track, take appropriate courses, and pass a comprehensive examination in their chosen option.

Third, they must choose a concentration area for further study (for example: organization development, health policy, city management, non-profit organizations, etc.) and pass a comprehensive examination in this area.

To qualify for an individualized track, the Ph.D. student must (1) develop a proposed plan of study for a specialty area which cannot be pursued adequately within either of the other two options, (2) include in the plan of study an adequate series of doctoral level university courses which can be taken on-site, and (3) obtain the written approval of the plan from the Ph.D. director.

DISSERTATION

Students are advanced to candidacy for the Ph.D. once they have completed all required course work and examinations and have been certified for candidacy by the program director. When students are formally advanced to candidacy, they must register for dissertation research each fall and spring semester until graduation. In general, a dissertation is a demonstration that a candidate for the doctoral degree is capable of doing independent, original scholarly and professional research that constitutes a contribution to knowledge in the broadly defined discipline of public administration.

Further details on the program can be found in the Handbook for the Doctor of Philosophy in Public Administration Program available from the Graduate School of Public Affairs.

COURSES

In the following double numbering system, a master's level student must enroll in the 5000/6000-level course and a doctoral student must enroll in the 7000/8000-level course.

P AD. 5010/7010-3. Fundamentals of Public Administration. Examines the history, nature, and scope of American public administration. This course defines the policy-making process, administrative structures, intra- and interorganizational dynamics and legislative/executive policy issues in the field, including administrative responsibility and ethical concerns.

P AD. 5020/7020-3. Statistics for Public Administration. (Same as C.J. 5020/7020.) Introduces students to probability theory, descriptive and inferential statistics. It includes an introduction to Statistical Package for the Social Sciences (SPSS) for the analysis of primary and secondary data. A statistics laboratory is included. Note: students may waive this course if they have taken an appropriate undergraduate or graduate level statistics course or can pass a competency examination offered by GSPA.

P AD. 5030/7030-3. Introduction to Public Management. Introduces systems, processes, and principles of managing public organizations. Specific attention is paid to organizing, planning, financing, coordinating, controlling, and monitoring compliance and accountability. Behavioral issues of leadership, communications, decision making, and motivation are covered. Prer.

P AD. 5040/7040-3. Research and Analytic Methods. Provides an overview of methods and techniques used in the collection and analysis of data, and develops skills in problem formulation. Methods covered
Public Administration Courses / 265

may vary but will typically include survey research, experimental design, forecasting, network analysis, and decision analysis. Pre-req., P AD. 5020/7020.

P AD. 5050/7050-3. Economics of the Public Sector. Covers basic concepts of microeconomics and their applicability to the allocation of resources in the public and private sectors, the evaluation of efficient and optimal resource use, public goods theory, the role of government in the economy and a limited introduction to macroeconomics and fiscal/monetary policies as they affect public administrators. Note: Students may waive this course if they have successfully completed a comparable graduate level course.

P AD. 5060/7060-3. Public Finance. Introduces governmental financial policy and its administration. This course includes the principles and politics of public sector resource allocation, budgetary systems, taxation, intergovernmental fiscal relations, and debt management. Pre-req., P AD. 5050/7050.

P AD. 5210/7210-3. Organization Theory and Administrative Behavior. Provides advanced knowledge of the interdisciplinary nature of organizational and interorganizational management. Draws on basic literature from organization theory, administrative behavior, organizational sociology and political science in focusing on the bureaucratic and social behaviors in and around complex organizations.


P AD. 5230/7230-3. Governmental Budgeting. Focuses on budget systems, processes, and policy issues with respect to federal, state, and local governments. Some practical budget-making exercises are conducted.


P AD. 5250/7250-3. Intergovernmental Management. Surveys the basic literature of intergovernmental management and examines the interactive role of managers at federal, state, regional, and local levels of government. Emphasis is placed on current intergovernmental issues. A grant writing workshop is included.

P AD. 5260/7260-3. Advanced Seminar in Public Management. Integrates the knowledge and skills of the common core and management track courses. Through the use of case studies, the course emphasizes the application of management theories and practices to actual issues/problems of public organizations. Specific attention is paid to the evaluation of organizational and program performance. (This integrative seminar is to be taken only after all common core and track core courses have been completed.)

P AD. 5310/7310-3. Public Policy Formulation and Implementation. Introduces students to the public policy process with specific emphasis on models of policy formulation and implementation. Examines program development and execution in the context of political, economic, and institutional environments. Using case studies, the course identifies criteria that can be used to determine the efficiency and effectiveness of public policies and programs.


P AD. 5340/7340-3. Intergovernmental Policy. Examines the economics of federalism and analyzes intergovernmental fiscal relationships. Describes the theories and rationale of fiscal aid policies and the results of such programs in equalizing fiscal resources and achieving national objectives. Includes exposure to the range of federal assistance, tax policies and coordination, borrowing and debt, mandating and tax expenditure limitations. Case analysis and the use of intergovernmental data banks are included. Pre-req., P AD. 5310/6310 and P AD. 5320/7320.

P AD. 5350/7350-3. Program Evaluation. Describes the theory and methodology for the design of social research and demonstration projects and the application of analytic and statistical methods for evaluating public programs. Focus is on the application of evaluation methods and techniques of data interpretation. Reports preparation is emphasized. Pre-req., P AD. 5320/7320 and P AD. 5040/7040.

P AD. 5360/7360-3. Advanced Seminar in Public Policy. Emphasizes the application of policy analysis to public programs. This practicum integrates the knowledge and skills gained in the common core and the policy analysis track. Student will be required to design and conduct a policy or program evaluation project. (This course is to be taken only after all the common core and policy analysis track courses have been completed.)


P AD. 5570/7570-3. Labor Relations and Public Employment. Relationships between public employees and their employers reflecting the change from a localized concern to the more generalized concern of the nation’s affairs: analysis of the evolution of management and worker organizations in government at all levels and their involvement in collective bargaining with or without legal control.

P AD. 5620/7620-3. The Politics of Public Sector Management and Administration. Examination of the politics of urban and public management; citizen participation in administrative decisions; managerial competition for limited resources; long-range planning in a political system; and the conflicts between urban politics and administrative efficiency.

P AD. 5630/7630-3. Ethics and Public Administration. Describes ethical principles of relevance to public administrators, managers, and policy analysts. Case studies will be used to help transfer general ethical concepts to "live" decisions, including those related to forging public-private partnerships.

P AD. 6100/7100-3. Computer Workshop. A broad introduction to the world of computers and computing in public administration with emphasis on microcomputers. Topics include computer systems, BASIC programming, word processing, spreadsheet analysis, database management systems, and applications. Considerable hands-on experience is provided.

P AD. 6110/7110-3. Computer Applications in the Public Sector. Develops skills in using computers to manage information and solve problems, with emphasis on microcomputers. Specific topics vary, and may include budgeting, economic modeling, municipal bond analysis, population projection, crime pattern analysis, as well as others. Use of existing software packages is emphasized.

P AD. 6120/7120-3. Information Resource Management. This course provides an introduction to material on information resource management. It is designed specifically to users and managers of computer systems, rather than operators or programmers. It is oriented primarily toward computerized public sector applications. The course provides the techniques required by public managers to plan and improve information systems in the public sector.

P AD. 6121-3. Behavioral Foundations of Management. Topic of this course include communication skills covering oral/listening/questioning techniques; group
development covering teambuilding/conducting meeting techniques; and problem solving and decision making including critical thinking, interpersonal/group problem solving processes.

P AD. 6122-3. Supervision and Human Resource Development. Covers technical personnel functions such as recruitment, exams, selection, classification, and compensation; job design, motivation, performance, and performance planning and training.


P AD. 6124-3. Program Management. The history of program management is covered and includes systems, processes, and climates. Program planning/design/management information systems/program evaluation and performance auditing also is presented.

P AD. 6130/7130-1 to 3. Workshop in Public Administration. Mini courses to develop skills in public administration.

P AD. 6600/7600-3. Special Topics and Classes in Public Administration and Public Policy. A study on special topics relevant to public administration such as public/private sector partnerships, hard choices facing America, conflict management, regionalism, managing economic options for Colorado, nonprofit management and marketing. Each semester various topics are studied.

P AD. 6910-3. Field Study in Public Administration. For students who have not had government experience. Studies and reports are made while students have full- or part-time administrative traineeships, internships, or similar positions in government agencies or government-related organizations. Prer., completion of the common core courses. It is recommended that at least three of the trackcourses also be completed.


P AD. 6960-3. Master's Project.

P AD. 8010-3. Doctoral Seminar on the Discipline and Profession of Public Administration. A historical overview course on developments and changes in public administration as a societal phenomenon and a field of study. Examined will be how public administration has evolved and is defined, practiced, studied and taught. Must be taken during first semester of Ph.D. program. Students with no previous public administration coursework will be required to have had at least the equivalent of an introductory course in public administration before enrolling in this course.


P AD. 8060-3. Doctoral Seminar on the Conduct of Empirical Inquiry. Examines a range of empirical approaches used in the study of public policy and management. Introduces some of the major concepts and problems of scientific inquiry; explores relevant aspects of the philosophy of science and further develops skills in the design, conduct, and use of research. Prer., P AD. 5020 and 5040.

P AD. 8070-3. Advanced Doctoral Seminar in Research Methods. This course provides in-depth knowledge about designing and conducting dissertation research. The course will follow a basic sequence of problem definition, theoretical and propositional formulation, sample selection, data collection and observational methods, data analysis and presentation, and writing up results. Students must have taken P AD. 8060 and be at the dissertation stage of their program.

P AD. 8890-1 to 10. Doctoral Dissertation. Once students are admitted to candidacy, they must be continuously registered for dissertation credit each fall and spring semester or be automatically dropped from the program. Part-time students must register for 7 credit hours a semester; full-time students for 10. In cases where students will not be using any university resources during a particular semester, they may petition the Ph.D. Director to register for only 3 credit hours in order to maintain continuous enrollment. Students must be registered for dissertation credit during the semesters they have a colloquium or defense.

Independent Study

P AD. 6840-1 to 6. Independent Study (Master's Level). Affords students the opportunity to do independent, creative work. Prer., consent of advisor.

P AD. 8840-1 to 6. Independent Study (Doctoral Level). Affords students the opportunity to do independent, creative work. Prer., consent of advisor.

MASTER OF CRIMINAL JUSTICE

The Master of Criminal Justice (M.C.J.) program is designed for students interested in comprehensive professional graduate education in the field of criminal justice. It is intended to develop in the student a fundamental understanding of the basic fields within criminal justice and of background material from supporting disciplines which would enable the student to adapt to many operational specializations.

As an academic and professional field of study, this program is dedicated to preparing men and women not only to administer the system as it presently exists but also to evaluate, to analyze, and to change — to become pioneers in accelerating the shaping of a rational and responsive criminal justice system.

To deal with this system effectively, capability for design of research must be developed along with the skills required in the ordering and analysis of empirical data. This course of study will also prepare the student to be an innovator in crime control and prevention through course work dealing with strategies and skills for promoting individual, organizational, and social change.

Degree Requirements

1. The program leading to the M.C.J. degree requires a minimum of 36 semester credit hours of appropriate graduate study with a grade average of B or better. No grade below C will be accepted for graduate credit.

2. The completion of the following core courses is required:

   C J. 5000. Law and Social Control
   C J. 5020. Statistics for Criminal Justice
   C J. 5100. Criminal Justice Administration
   C J. 5110. Criminal Justice Planning and Evaluation

3. Students must complete a minimum of 21 semester credit hours of course work in criminal justice.

4. Students who have not had criminal justice experience are required to complete C J. 6910 (Field Study). A minimum of 240 hours of supervised work is required to earn 3 hours of credit.

5. Completion of either a thesis/project or a comprehensive written examination taken during the last semester of enrollment is required. An oral examination based on the material covered in the thesis may be required at the option of the student's thesis committee.

Students must develop specific degree programs expressing their principal focus of interest and professional objectives. In doing so, their degree plans may include courses within other academic or professional disciplines.
ELECTIVE COURSES

The courses listed below may be utilized as electives for the M.C.J. degree:

C J. 5310. Seminar in Criminal Justice Management
C J. 5320. Seminar in Police Administration
C J. 5321. Research in Criminal Justice Process
C J. 5510. Seminar in Contemporary Law Enforcement
C J. 5520. Seminar in Correctional Administration
C J. 5530. Seminar in Community Corrections
C J. 5540. Juvenile Justice Administration
C J. 5550. Seminar in Criminal Justice Policy Analysis
C J. 5551. Seminar in Judicial Administration and Organization
C J. 5560. Seminar in Comparative Criminal Justice
C J. 5570. Advanced Seminar in Criminal Justice
C J. 6600. Special Topics in Criminal Justice Administration
C J. 6950. Area Paper or Thesis

COURSES

C J. 5000/7000-3. Law and Social Control. A general introduction to the nature of law, legal institutions, and legal processes as one among multiple systems of social control; consideration of various theories of interpretation, application, and enforcement of law; the structure and function of legal institutions.

C J. 5020/7020-3. Statistics for Criminal Justice. Introduces students to probability theory, descriptive and inferential statistics. It includes an introduction to Statistical Packaging for Social Sciences (SPSS) for the analysis of primary and secondary data. A statistics laboratory is included. Note: Students may waive this course if they have taken an appropriate undergraduate or graduate level statistics course or can pass a competency examination offered by GSPA.

C J. 5100/7100-3. Administration of Criminal Justice. Analysis of the policies and practices of agencies involved in the criminal justice process from detection of crime and arrest of suspects through prosecution, adjudication, sentencing, and imprisonment to release. The patterns of decision and practices are reviewed in the context of the entire criminal justice system.

C J. 5110/7110-3. Criminal Justice Planning and Evaluation. Techniques for assessing the probability and desirability of future possible states of society, and particularly of social control systems, will be considered in relation to the goals of the criminal justice system.


C J. 5310/7310-3. Seminar: Criminal Justice Management. This course is designed to provide the student with an overview of organizational theory and administrative behavior. In particular, different schools of thought and management approaches will be studied to improve organizational efficiency and effectiveness in criminal justice agencies. Case studies in a variety of agency settings will be utilized.

C J. 5320/7320-3. Seminar: Police Administration. The role of the police in a rapidly changing society; relationship between police services, the courts, and correctional administration.

C J. 5321/7321-3. Research in the Criminal Justice Process. Examination of current research in criminal justice; problems in the implementation of research findings.

C J. 5510/7510-3. Seminar: Contemporary Law Enforcement. Strategies for implementing new programs directed at social control and crime prevention. Experiences in programmatic innovations and revolutionary interventions in law enforcement administration; case histories of past efforts at radical change and experimentation, emphasis on implementation strategy and consequences of innovation.


C J. 5530/7530-3. Seminar: Administration of Community-Based Correction. Theory and practice of probation and parole; examination of efforts to create mixtures of institutional settings and normal community life.

C J. 5540/7540-3. Juvenile Justice Administration. Policies and practices of agencies in processing young persons through the juvenile court system; trends in juvenile justice: examination of disposition of cases by probation; foster home placement, training schools, and transfer to adult correction programs.

C J. 5550/7550-3. Seminar: Criminal Justice Policy Analysis. This course deals with crime as a national political issue and examines how conflicting political philosophies influence criminal justice policy. Case studies will be made of significant criminal justice policy changes in both the federal and state levels (e.g., New York minimum sentencing for drug offenders, Omnibus Crime Control, and Safe Streets Act.)

C J. 5551/7551-3. Seminar: Judicial Administration and Organization. An analysis of judicial organization, court administration, and criminal court judges as participants in the operation of the criminal justice process; attention to the prosecutor and public defender systems.


C J. 5570/7570-3. Advanced Seminar in Criminal Justice. A study of contemporary problems relevant to criminal justice, taught by highly qualified persons in the particular subject matter. Each semester a different problem is studied.

C J. 6600/7600-3. Specific Topics in the Criminal Justice System. Analysis of specific topics relating to the criminal justice process.

C J. 6910-3. Field Study in Criminal Justice. For students who have not had practitioner experience, a full- or part-time internship is required. Consent of instructor. Prer., 12-15 hrs of criminal justice course work.


Independent Study

C J. 6840-1 to 6. Independent Study (Master's Level). Affords students the opportunity to do independent creative work. Prer., consent of advisor.

C J. 8840-1 to 6. Independent Study (Doctoral Level). Affords students the opportunity to do independent creative work. Prer., consent of advisor.
Note: This roster lists faculty members holding regular and special appointments during the 1989-90 academic year. New 1990-91 appointments are not finalized at the time of printing.

HARRIET ABLE-BOONE, Assistant Professor of Education. B.S., Presbyterian College; M.A., Furman College; Ph.D., Vanderbilt University.

FREDRICK R. ABRAMS, Associate Director of Biomedical Ethics, Center for Health Ethics and Policy; Professor Adjunct of Public Affairs. B.A., M.D., Cornell University.

R. WAYNE ADKINS, Chairman of the Department and Professor of Mechanical Engineering. B.S., M.S., Ph.D., University of Illinois.

GITA ALAGHBAND, Assistant Professor of Computer Science. B.S., University of Tehran (Iran); M.S., Ph.D., University of Colorado.

CAMILA ALIRE, Instructor and Assistant Director of Instruction and Research Services, Auraria Library. B.A., Adams State College; M.L.S., University of Denver; Ed.D., University of Northern Colorado.

FREDERICK S. ALLEN, Professor of History. A.B., Amherst College; Ph.D., Harvard University.

STEPHEN P. ALLEN, Assistant Professor of Accounting. B.A., College of William and Mary; M.A., University of North Carolina, Chapel Hill; M.A., Ph.D., Harvard University.

RAVEL AMMERMAN, Senior Instructor in Electrical Engineering. B.S., Colorado School of Mines; M.S., University of Colorado.

LARRY G. ANDERSON, Associate Professor of Chemistry. B.S., Rose Polytechnic Institute; Ph.D., Indiana University.

MARVIN F. ANDERSON, Associate Professor of Electrical Engineering and Computer Science. B.S., M.S., University of Denver.

RICHARD H. ANDERSON, Associate Professor of Sociology. B.A., M.A., Ph.D., University of Oregon.

ERNEST ANDRADE, Jr., Professor of History. B.A., M.A., University of Hawaii; Ph.D., Michigan State University.

ARTEM ZAVENOVICH ARABAJAN, Visiting Professor of Economics. B.A., Ph.D., Moscow Institute of Oriental Studies (USSR).

MARCELLE V. ARAK, Professor of Finance. B.A., University of Rochester; Ph.D., Massachusetts Institute of Technology.

GEORGÉ Z. ARASIMOWICZ, Assistant Professor of Music. B.Mus., University of Toronto (Canada); M.A., McGill University (Canada); Ph.D., University of California, San Diego.

ORLANDO ARCHIBEQUE, Instructor and Education/Social Science Librarian, Auraria Library. B.A., Hastings College; M.A., University of Denver; M.A., University of Hawaii, Manoa.

B. THOMAS ARNBERG, Associate Professor of Mechanical Engineering, B.S., M.S., University of Colorado. Professional Engineer: Colorado.

ERIC J. ARNOULD, Assistant Professor of Anthropology. B.A., Bard College; M.A., Ph.D., University of Arizona.

LORI L. ARP, Instructor and Library Instruction Coordinator, Auraria Library. A.B., M.S., University of Illinois.

W. GRAHAM ASTLEY, Associate Professor of Management. B.A., M.B.A., University of Liverpool (England); Ph.D., University of Washington, Seattle.

BRIAN ATKINSON, Senior Instructor in Electrical Engineering and Computer Science. B.S., Colorado School of Mines; M.S., University of Colorado.

GERALD J. AUDEISRK, Associate Professor of Biology. B.A., Rutgers University; Ph.D., California Institute of Technology.

TERESA E. AUDEIRSK, Associate Professor of Biology. B.S., Bucknell University; Ph.D., University of Southern California.

GEORGE AUTOBEE, Part-time Instructor in Urban and Regional Planning. B.A., University of Southern California; M.A., University of Northern California.

DAVID J. AXELSON, Associate Professor Adjunct of Public Affairs. B.A., M.A., University of Northern Colorado; Ed.D., University of Colorado.

FERNIE BACA, Assistant Vice Chancellor for Research and Creative Activities; Associate Professor of Education. B.A., University of Northern Colorado; M.A., Ph.D., University of Colorado.

JO-ANNE BACHOROWSKI, Instructor in Psychology. A.B., College of the Holy Cross; M.S., University of Wisconsin, Madison.

BEN-HSIEN BAO, Assistant Professor of Accounting. B.A., Fu-Jen Catholic University (Taiwan); M.B.A., University of Southern California; Ph.D., University of Missouri.

STEPHAN E. BARLOW, Senior Instructor in Chemistry. B.A., Southern Oregon State College; Ph.D., University of Colorado.

GORDON G. BARNEWALL, Professor of Marketing. B.S., University of Colorado; M.B.A., Ph.D., Ohio State University.

WALTER L. BARR, Associate Professor of Music. B.S., M.A., Northern Arizona University; Ed.D., Arizona State University.

PAUL E. BARTLETT, Dean Emeritus, College of Engineering and Applied Science and Professor Emeritus of Civil Engineering. B.S.(Civil), B.S.(Bus.), M.S., University of Colorado. Professional Engineer: Colorado.

PAUL BAUMAN, Director. Division of Extended Studies: Assistant Professor Adjunct of Public Affairs. B.A., University of Nebraska; M.A., University of Wyoming; D.P.A., University of Colorado.

BARBARA BEBENSEE, Assistant Professor of Education. B.A., Kearney State College: Specialist Degree. University of Southern Mississippi; M.A., Ph.D., College of William and Mary.

CHARLES BECK, Associate Professor of English. B.A., University of Pittsburgh; M.A., St. Mary’s University; Ph.D., University of Denver.

STEVEN BECKMAN, Assistant Professor Adjunct of Economics. B.A., M.A., Ph.D., University of California, Davis.

BRUCE W. BERGLUND, Executive Vice Chancellor; Associate Professor of Education. B.S., Iowa State University; Ph.D., Stanford University.

JOY L. BERRENBERG, Assistant Professor of Psychology. B.A., M.A., Ph.D., University of Colorado.

SAMUEL A. BETTY, Associate Professor of Communication. B.A., Spring Hill College; M.S., University of Iowa; Ph.D., Michigan State University.

JAN BIALASIEWICZ, Associate Professor of Electrical Engineering and Computer Science. M.S., Warszawa Technical University (Poland); Ph.D., D.Sc., Silesian Technical University (Poland). Professional Engineer: Colorado.

HEIDI BOERSTLER, Assistant Professor of Health Administration. B.A., Northwestern University; B.S., Johns Hopkins University; M.N., University of Washington; M.P.H., Dr. P.H., Yale University.


SOONTORN BOONYATIKARN, M.Arch. II Program Coordinator. Associate Professor of Architecture and Interior Design. B.Arch., Chulalongkorn University (Thailand); M.Arch., Pratt Institute; D.Arch., University of Michigan.

WILLIAM A. BURRELL, Associate Professor of Information Systems. B.A., Vassar College; M.S., Massachusetts Institute of Technology. B.S., University of Colorado.

JAMES A. CAVENDER, Assistant Professor Adjunct of Mathematics. B.A., Ph.D., University of Colorado.

LLOYD BURTON, Assistant Professor of Public Affairs. B.A., Prescott College; M.A., San Francisco State University; B.S., Ph.D., University of California, Berkeley.

JOHN R. CLARK, Chancellor, University of Colorado at Denver. B.A., College of Wooster; M.P.A., Ph.D., University of Michigan.

REX S. BURNS, Professor of English. B.A., Stanford University; M.A., Ph.D., University of Minnesota.

WILLIAM A. BURRELL, Assistant Professor Adjunct of Sociology. M.A.P.A., Ph.D., University of Virginia; B.A., Ph.D., Howard University.

LLOYD BURTON, Assistant Professor of Public Affairs. B.A., Prescott College; M.A., San Francisco State University; B.S., Ph.D., University of California, Berkeley.

ROXANNE M. BYRNE, Associate Professor of Mathematics. B.S., M.S., Ph.D., University of Colorado.

ALAN CANTER, Associate Professor Adjunct of Urban and Regional Planning. B.A., City College of New York.

WAYNE F. CASCIRO, Professor of Management. B.A., College of the Holy Cross; M.A., Emory University; Ph.D., University of Rochester.

M. KENT CASPER, Associate Professor of German. B.A., University of Utah; Ph.D., Harvard University.

J. BRAD BOWLES, Professor of Engineering. B.S., M.S., University of Illinois.

JEAN-CLAUDE BOSCH, Assistant Professor of German. B.A., University of Nantes (France); M.A., University of California, Berkeley.

PETER G. BRYANT, Professor of Educational Psychology. B.A., M.A., M.Phil., Ph.D., Columbia University.

RICHARD BRAND, Assistant Professor of Music. B.A., M.A., Ph.D., University of Colorado.

DAVID BRAMHALL, Professor of Sociology. B.A., M.A., University of Pennsylvania.

MARK A. CLARKE, Associate Professor of Social Science. B.A., Clark University; M.A., Ph.D., University of Colorado.

WILLIAM H. CLOHESSY, Professor of Mechanical Engineering. B.S., Queens College; Ph.D., Cornell University.

DONALD COLBERG, Associate Professor of Education. B.A., Bethany College; M.A., University of Kansas; M.L.S., University of Oklahoma; Ph.D., University of Minnesota.

NED COLLIER, Assistant Professor of Architecture. B.Arch., University of Cincinnati; M.S. Arch., Columbia University.

NANCY L. COMMINS, Assistant Professor of Education. M.S., State University of New York; B.S., Ph.D., University of Colorado.

JANE COMSTOCK, Instructor Attendant in Fine Arts. B.A., Whittier College; M.A., University of Denver.

RICHARD G. CONN, Associate Professor Adjunct of Anthropology and Fine Arts. B.A., M.A., University of Washington.

MARY S. CONROY, Associate Professor of History. B.A., St. Mary's College; A.M., Ph.D., Indiana University.

EDWARD J. CONNY, Associate Professor of Business Law and Business Ethics. B.A., California State University; M.B.A., J.D., University of California.

GAYL P. COOK, Assistant Professor of Physics. B.S., Imperial College; M.S., Ph.D., University of Colorado.

RICHARD E. COOK, Assistant Professor of Finance. B.A., Metropolitan State College; M.A., Ph.D., University of Washington, St. Louis.

DAVID COOPER, Part-time Instructor in Urban and Regional Planning. B.A., Ph.D., University of Colorado.

LUANN COSTA, Assistant Professor of Education. B.A., Creighton University; M.A., Ph.D., University of Colorado.

ROBERT COX, Part-time Instructor in Interior Design. B.Arch., University of Colorado.

J. JOSEPH CRAFT, Instructor Adjunct in Theatre. B.A., McMurry College; M.A., University of Denver.

JOHN CRITES, Assistant Professor of Education. A.B., Princeton University; Ph.D., Columbia University.

GARY J. CROWELL, Associate Professor Adjunct of Architecture. B.Arch., University of Minnesota; M.Arch., Massachusetts Institute of Technology.

PEGGY CUCITI, Senior Research Associate, Center for Public-Private Sector Cooperation; Associate Professor. B.A., State University at Stony Brook; M.A., Ph.D., University of Chicago.

LAURA CUETARA, Associate Professor of Theatre. B.A., Dartmouth College; M.F.A., Boston University.

MICHAEL S. CUMMINGS, Associate Professor of Chemical Science. A.B., Princeton University; A.M., Ph.D., Stanford University.
LAWRENCE F. CUNNINGHAM, Associate Professor of Transportation and Marketing. B.S., Niagara University; M.S., Northwestern University; M.B.A., D.B.A., University of Tennessee.


E. WOODROW ECKARD, JR., Associate Professor of Business Economics. B.S., University of Chicago; M.A., Ed.D., Stanford University.

MARGARET EVERETT, Instructor. B.A., M.A., Ph.D., Pennsylvania State University.

ROBERT W. GAGE, Associate Professor of Political Science. B.A., M.A., Ph.D., University of California, Berkeley.

JAMES H. GERALD, Associate Professor of Marketing. B.S., University of California, Davis; M.S., Ph.D., University of Colorado.

NANCY ELMER, Instructor in Psychology. B.S., Wesleyan University; M.A., Ph.D., University of California, Los Angeles.

SANDRA B. EMMERT, Associate Dean. B.S., Boston University; M.A., Ph.D., Harvard University.

JOHN J. EMMERT, Professor of Political Science. B.A., M.A., Ph.D., University of California, Berkeley.

MARK A. EMERY, Associate Professor of Economics. B.S., University of Oregon; M.S., Ph.D., University of California, Los Angeles.

DONALD J. EMMERT, Professor of Political Science. B.A., University of California, Los Angeles; M.A., Ph.D., Stanford University.

BENNETT FLECK, Assistant Professor of Political Science. B.A., University of California, Berkeley; M.A., Ph.D., University of Chicago.

MARK FLECK, Assistant Professor of Political Science. B.A., University of California, Los Angeles; M.A., Ph.D., Stanford University.

DANIEL FLECK, Professor of Political Science. B.A., University of California, Los Angeles; M.A., Ph.D., Stanford University.

JAMES FLECK, Assistant Professor of Political Science. B.A., University of California, Los Angeles; M.A., Ph.D., Stanford University.

ALLEN FLECK, Associate Professor of Political Science. B.A., University of California, Los Angeles; M.A., Ph.D., Stanford University.

JAMES FLECK, Professor of Political Science. B.A., University of California, Los Angeles; M.A., Ph.D., Stanford University.

DANIEL FLECK, Associate Professor of Political Science. B.A., University of California, Los Angeles; M.A., Ph.D., Stanford University.

JAMES FLECK, Assistant Professor of Political Science. B.A., University of California, Los Angeles; M.A., Ph.D., Stanford University.

DANIEL FLECK, Professor of Political Science. B.A., University of California, Los Angeles; M.A., Ph.D., Stanford University.
State College; Ed.D., University of Colorado.

JOANN E. GLITZENBERG, Associate Professor of Anthropology. B.S., M.S., Ph.D., University of Colorado.

WILBUR H. GÖLTERMANN, JR., Senior Instructor in Computer Science. B.S., University of Colorado; M.S., Massachusetts Institute of Technology.

LAURA D. GOODWIN, Professor of Education. B.A., M.A., University of Santa Clara; Ph.D., University of Colorado.

WILLIAM L. GOODWIN, Professor of Education. B.S., University of Nebraska; M.Ed., University of Illinois; Ph.D., University of Wisconsin; U.S.O.E., Harvard University.

R. SCOTT GRABINGER, Assistant Professor of Education. A.B., Loyola University; M.S., Illinois State University; Ed.D., Indiana University.

JAMES GRADY, Assistant Professor Adjunct of Anthropology. B.G.S., University of Colorado.

WILLIAM F. GRADY, Dean, School of Education; Professor of Education. B.A., Harding College; M.Ed., Ed.D., University of Arkansas.

THOMAS W. GRANEMANN, Associate Professor of Public Affairs; Associate Director, Center for Health Ethics and Policy. B.S., M.S., University of New Mexico; Ph.D., Northwestern University.

DAVID E. GREENBERG, Associate Professor Adjunct of Public Affairs. B.A., Columbia University; J.D., Harvard Law School.

HARVEY GREENBERG, Professor of Mathematics. B.S., University of Miami; Ph.D., Johns Hopkins University.

W. I. GRIFFITH, Associate Professor of Sociology. B.A., M.A., Ph.D., Washington State University.

JAMES C.Y. GUO, Associate Professor of Civil Engineering. B.S., National Cheng-Kung University (Taiwan); M.S., National Taiwan University (Taiwan); Ph.D., University of Illinois, Urbana. Professional Engineer: Colorado.

KIMBERLY A. HABEGGER, Assistant Professor of Spanish. B.S., M.A., Ph.D., Ohio State University.

LOUIS B. HALL, Professor Emeritus of English. B.A., Pennsylvania State University; M.A., University of Nevada; Ph.D., University of Oregon.

JOHN S. HALLER, JR., Professor of History. B.A., Georgetown University; M.A., John Carroll University; Ph.D., University of Maryland.

WILLIAM R. HAMILTON, Assistant Professor Adjunct of Civil Engineering. B.M.E., General Motors Institute; M.S., Ph.D., University of Colorado. Professional Engineer: Colorado, Michigan.

MITCHELL M. HANDELSMAN, Associate Professor of Psychology. B.A., Haverford College; M.A., Ph.D., University of Kansas.

ERNST C. HARRIS, Professor Emeritus of Civil Engineering. B.C.E., Cleveland State University; M.S., University of Texas; Ph.D., University of Colorado. Professional Engineer: Colorado, Ohio.

EMILY L. HARTMAN, Professor of Biology. M.A.(Lib.Sci), University of Denver; B.A., M.A., Ph.D., University of Kansas.

ZENAS R. HARTVIGSON, Associate Professor of Mathematics. B.S., Oregon College of Education; M.A., Harvard University; Ph.D., Oregon State University.

MARVIN HATAMI, Associate Professor of Architecture and Urban Design. B.S., University of Tehran (Iran); B.Arch., University of Colorado; M.Arch., Yale University.

COLBY RAY HATFIELD, Associate Professor Adjunct of Anthropology. B.A., Clark University; M.A., Ph.D., The Catholic University of America.

H. MICHAEL HAYES, Professor of Marketing and Strategic Management. B.S., University of New Mexico; Ph.D., University of Michigan.

EMMETT L. HAYWOOD, Part-time Instructor in Urban and Regional Planning. B.A., Kansas State University; M.C.R.P., University of Oklahoma.

SUZANNE W. HELBURN, Professor of Economics. B.A., American University; M.A., Ph.D., Indiana University.

ANDREW HELWIG, Associate Professor of Education. B.S., St. Norbert College; M.S., Iowa State University; Ph.D., University of Wisconsin.

PHILIP A. HERNANDEZ, Assistant Professor of History. B.A., University of Santa Clara; Ph.D., University of California, Berkeley.

GINA R. HERNEZ-BROOME, Instructor in Psychology. B.S., University of Colorado; M.S., Colorado State University.

JEFF E. HEYI, Assistant Professor of Operations Management. B.A., Ohio Northern University; M.B.A., Baldwin-Wallace College; Ph.D., Arizona State University.

COLLIN J. HIGHBOWER, Professor of Mathematics. B.S., University of Arkansas; Ph.D., Tulane University.

DAVID R. HILL, Associate Professor of Urban and Regional Planning. A.B., Princeton University; M.U.R.P., University of North Carolina; Ph.D., University of Minnesota.

JOHN D. HOAG, Professor Emeritus of Architecture. B.S., Harvard University; Ph.D., Yale University.

DONALD W. HOAGLAND, Director, Center for Health Ethics and Policy. B.A., Yale University; J.L.B., Columbia University.

KENNETH L. HOAGLAND, Part-time Instructor in Urban and Regional Planning. B.A., Doane College; M.R.P., University of Massachusetts.

ROBERT D. HOCKENBURY, Instructor in Accounting. B.S., Iowa State University; M.S., University of Houston.

VIRGINIA HODGKINSON, Associate Professor Emeritus of Public Affairs. B.A., University of Nebraska; M.A., Fairleigh Dickinson University; Ph.D., Southern Illinois University.

BRIAN HOLTZ, Assistant Professor and Instructional Designer. A.A.S., Southern Illinois University; M.A., Sangamon State University; Ph.D., University of Wisconsin, Madison.


GEORGE HOOVER, Professor of Architecture. B.Arch., Cornell University.

MEI-CHU W. HSIAO, Associate Professor of Economics. B.A., National Taiwan University (Taiwan); M.A., Ph.D., University of Rochester.

DAVID W. HUBLY, Chair and Associate Professor of Civil Engineering. B.S., M.S., Ph.D., Iowa State University. Professional Engineer: Colorado.

WILLIAM C. HUGHES, Professor of Civil Engineering. B.S. (Meteorol.). University of Utah; B.S., M.S., Ph.D., University of New Mexico. Professional Engineer: Colorado.


KENNETH A. HUNT, Assistant Professor of Marketing. B.S., Concord College; M.B.A., Ph.D., Virginia Polytechnic Institute and State University.

FRANKLIN J. JAMES, JR., Professor of Public Affairs. B.A., University of Georgia; M.A., Ph.D., Columbia University.


CRAIG R. JAMES, Assistant Professor of Anthropology. B.A., University of California, San Diego; M.A., University of Colorado; Ph.D., University of California, Berkeley.

FRANK J. JERMANCE, Assistant Professor of Music. B.S., University of Colorado; M.M., B.M.A., University of Miami.

BYRON L. JOHNSON, Professor Emeritus of Economics. B.A., M.A., Ph.D., University of Wisconsin.

GERALD C. JOHNSON, Associate Pro-
ASSOCIATE PROFESSOR OF CIVIL ENGINEERING: B.A., B.S., State University of New York; M.S., University of Wisconsin; Ph.D., Cornell University. Professional Engineer: Connecticut.

MARK JOHNSTON, Associate Professor Adjunct of Landscape Architecture. B.L.A., Utah State University; M.A.A., Harvard University.

RON JOHNSTON, Part-time Instructor in Architecture. A.A.S., Colorado Mountain College.

TODD JOHNSTON, Associate Professor Adjunct of Landscape Architecture. B.L.A., Utah State University; M.A.A. Harvard University.

ROBERT D. JOHNSTON, Professor of English. B.A., University of Maryland; M.A., Ph.D., University of Missouri.

SHIRLEY W. JOHNSTON, Associate Professor of English. B.A., M.A., University of Denver; Ph.D., University of New Mexico.

DAVID H. JONASSEN, Professor of Education. B.A., M.A., University of Delaware; Ph.D., Temple University.

BERNARD JONES, Associate Professor of Urban and Regional Planning. B.A., M.A., University of Missouri, Kansas City; Ph.D., University of Colorado.

KATHRYN JONES, Associate Professor of Mathematics. B.S., Mary Washington University; M.S., New Mexico Highlands University; Ph.D., University of Houston.

WILLIAM J. JURASCHEK, Dean of Mathematis. B.S., M.S., Queens University (Ireland); Ph.D., Birmingham University (England).

MARK JOHNSON, Associate Professor of Mathematics. B.S., Muskingum College; M.A., University of Cincinnati; Ph.D., Oregon State University.

MARVIN D. LOF LIN, Dean of College of Liberal Arts and Sciences; Professor of English. B.A., M.A., Brigham Young University; Ph.D., Indiana University.

JOHN S. LOFTY, Assistant Professor of English and Education. B.Ed., London University (England); M.A., Tennessee State University; Ph.D., University of Michigan.

ANTON LOWENBERG, Associate Professor of Economics. B.A., University of Natal (South Africa); M.A., Ph.D. Simon Fraser University.

J. RICHARD LUND GREN, Professor of Mathematics. B.S., Worcester Polytechnic Institute; M.S., Ph.D., Ohio State University.

MARIT MACARTHUR, Instructor and Serials Cataloger. Auraria Library; A.B., University of North Carolina; M.L.S., Peabody College.

MARY MACIEJEWSKI-FARMER, Senior Instructor in Chemistry. B.S., M.S., University of Wisconsin; Madison; Ph.D., University of Utah.

MARC MAHIIOS, Associate Dean for Teacher Education. School of Education; Associate Professor of Education. B.S., B.A., M.A., Ph.D., Arizona State University.

ARUN K. MAJUMDAR, Professor of Electrical Engineering and Computer Science. B.S., M.E., University of Calcutta, (India); M.S., University of Texas; Ph.D., University of California.

T A I S T O H. MAKE LA, Assistant Professor of Architecture. B.Arch., University of Oregon; M.A. (Arch.), Ph.D., Princeton University.

MARTIN M. MALTEMPO, Associate Professor of Physics. B.A., Queens College of the City University of New York; M.A., M.Phil., Ph.D., Columbia University.

LYNN E. JOHNSON, Associate Professor of Civil Engineering. B.A., B.S., State University of New York; M.S., University of Wisconsin; Ph.D., Cornell University. Professional Engineer: Connecticut.

MARK JOHNSTON, Associate Professor Adjunct of Landscape Architecture. B.L.A., Utah State University; M.A.A., Harvard University.

RON JOHNSTON, Part-time Instructor in Architecture. A.A.S., Colorado Mountain College.

TODD JOHNSTON, Associate Professor Adjunct of Landscape Architecture. B.L.A., Utah State University; M.A.A. Harvard University.

ROBERT D. JOHNSTON, Professor of English. B.A., University of Maryland; M.A., Ph.D., University of Missouri.

SHIRLEY W. JOHNSTON, Associate Professor of English. B.A., M.A., University of Denver; Ph.D., University of New Mexico.

DAVID H. JONASSEN, Professor of Education. B.A., M.A., University of Delaware; Ph.D., Temple University.

BERNARD JONES, Associate Professor of Urban and Regional Planning. B.A., M.A., University of Missouri, Kansas City; Ph.D., University of Colorado.

KATHRYN JONES, Associate Professor of Mathematics. B.S., Mary Washington University; M.S., New Mexico Highlands University; Ph.D., University of Houston.

WILLIAM J. JURASCHEK, Dean of Mathematis. B.S., M.S., Queens University (Ireland); Ph.D., Birmingham University (England).

MARK JOHNSON, Associate Professor of Mathematics. B.S., Muskingum College; M.A., University of Cincinnati; Ph.D., Oregon State University.

MARVIN D. LOF LIN, Dean of College of Liberal Arts and Sciences; Professor of English. B.A., M.A., Brigham Young University; Ph.D., Indiana University.

JOHN S. LOFTY, Assistant Professor of English and Education. B.Ed., London University (England); M.A., Tennessee State University; Ph.D., University of Michigan.

ANTON LOWENBERG, Associate Professor of Economics. B.A., University of Natal (South Africa); M.A., Ph.D. Simon Fraser University.

J. RICHARD LUND GREN, Professor of Mathematics. B.S., Worcester Polytechnic Institute; M.S., Ph.D., Ohio State University.

MARIT MACARTHUR, Instructor and Serials Cataloger. Auraria Library; A.B., University of North Carolina; M.L.S., Peabody College.

MARY MACIEJEWSKI-FARMER, Senior Instructor in Chemistry. B.S., M.S., University of Wisconsin; Madison; Ph.D., University of Utah.

MARC MAHIIOS, Associate Dean for Teacher Education. School of Education; Associate Professor of Education. B.S., B.A., M.A., Ph.D., Arizona State University.

ARUN K. MAJUMDAR, Professor of Electrical Engineering and Computer Science. B.S., M.E., University of Calcutta, (India); M.S., University of Texas; Ph.D., University of California.

T A I S T O H. MAKE LA, Assistant Professor of Architecture. B.Arch., University of Oregon; M.A. (Arch.), Ph.D., Princeton University.

MARTIN M. MALTEMPO, Associate Professor of Physics. B.A., Queens College of the City University of New York; M.A., M.Phil., Ph.D., Columbia University.
JAN MANDEL, Associate Professor of Mathematics. M.S., Ph.D.(equivalent), Charles University (Czechoslovakia).

FLOYD C. MANN, Professor Emeritus of Public Affairs. B.A., M.A., University of Iowa; Ph.D., University of Michigan.

THOMAS A. MANTEUFFEL, Professor of Mathematics. B.S., University of Wisconsin; M.S., Ph.D., University of Illinois.

MICHAEL S. MARCH, Professor Emeritus of Public Affairs. B.A., University of Colorado; Ph.D., Harvard University.

FRANK H. MARSH, Professor of Philosophy. B.L., M.A., Ph.D., University of Tennessee.

W. MICHAEL MARTIN, Associate Professor of Education. A.B., University of California, Santa Barbara; M.A., Ph.D., University of California, Los Angeles.

DANNY E. MARTINEZ, Executive Director, Student Retention Services; Part-time Instructor Attendant Rank in Spanish and Ethnic Studies. B.A., M.A., University of Colorado.

JEANNE K. MAYNE, Instructor in Geography. B.A., M.A., University of Colorado.

JOHN R. MAYS, Professor of Civil Engineering. B.S., Lamar State College; M.S., Ph.D., University of Colorado. Professional Engineer: Colorado.

G. MICHAEL MC CARRY, Assistant Professor Adjunct of History. B.A., Regis College; M.A., Ph.D., University of Denver.

STEPHEN MC CORMICK, Professor of Mathematics. B.A., San Diego State College; Ph.D., University of California.

GLENN E. McGLEATHY, Professor of Education. B.S., Texas Wesleyan College; M.E., Ph.D., University of Texas.

C. KENT MC GUIRE, Assistant Professor of Education. B.A., University of Michigan; M.A., Columbia University.

GILBERT F. MC NEISH, Associate Professor Adjunct of Urban and Regional Planning. B.A., Drake University; M.P.A., University of Pittsburgh; J.D., University of Denver.

STEVEN G. MEDEMA, Assistant Professor of Economics. B.A., Calvin College; M.A., Ph.D., Michigan State University.

ELNORA M. MERCADO, Assistant Professor and Deputy Assistant Director for Collection and Automation, Auraria Library. B.S., University of the Philippines; M.S., Syracuse University.

RUSSELL W. MEYERS, Associate Professor of Education. B.A., Park College; Ph.D., University of Chicago.

DANIEL F. MICHAELS, Associate Professor of Electrical Engineering and Computer Science. B.E.E., Rensselaer Polytechnic; Ph.D., University of California.

ELAINE K. MILLER, Assistant Professor Adjunct of Psychology. B.A., M.A., Ph.D., University of Michigan, Ann Arbor.

JAMES MILLEVILLE, Senior Instructor in Business Administration. B.S., Valparaiso University; M.S., Purdue University.

MARILYN J. MITCHELL, Acting Associate Director, Instructor and Assistant Director for Collection and Automation Services, Auraria Library. B.A., Occidental College; M.I.S., University of Texas.

ANNE MOELLER, Assistant Professor of Management. B.A., University of Washington; M.A., Michigan State University; Ph.D., University of Maryland.

WILLIAM M. MONSOUR III, Assistant Professor of Communication. B.S., Louisiana State University; M.A., University of Arkansas; Ph.D., University of Illinois.

TERRY ANN MOODY, Assistant Professor and Language/Literature/Reference Librarian, Auraria Library. B.A., Brown University; M.S., Simmons College.

MARTIN L. MOODY, Acting Assistant Dean, College of Engineering and Applied Science; Professor Emeritus of Civil Engineering. B.S., University of Missouri; M.S., University of Colorado; Ph.D., Stanford University. Professional Engineer: Colorado.

CHARLES L. MOONE II, Professor of Fine Arts. B.F.A., Ohio Wesleyan University; M.A.(Art History), M.A.(Painting), Ohio State University.

JANET R. MOONE, Associate Professor of Anthropology. M.A., University of Colorado; B.A., Ph.D., University of Arizona.

LORNA G. MOORE, Professor of Anthropology. B.A., Smith College; M.A., Ph.D., University of Michigan.

ROBERT E. MOORE, Instructor in Marketing. B.S., M.A., Ed.D., University of Colorado.

HANS MORGENTHALER, Assistant Professor of Architecture and Landscape Architecture. B.A., University of Zurich (Switzerland); M.A., Ph.D., Stanford University.

GLENN T. MORRIS, Assistant Professor of Political Science. B.A., University of Colorado; J.D., Harvard University School of Law.

JAMES R. MORRIS, Professor of Finance. B.S., M.B.A., Ph.D., University of California, Berkeley.

JOHN R. MORRIS, JR., Professor of Economics. B.A., Cornell University; M.S., Ph.D., Purdue University.

HOWARD P. MOVSHOVITZ, Assistant Professor of English. B.A., University of Pennsylvania; M.A., Ph.D., University of Colorado.

WILLIAM C. MUCHOW, Professor Adjunct of Architecture. B.S., University of Illinois; M.Arch., Cranbrook Academy of Art.

BRADFORD K. MUDGE, Assistant Professor of English. B.A., Johns Hopkins University; M.A., Duke University; Ph.D., University of Texas, Austin.

MICHAEL MURPHY, Professor of Education. B.A., Whittier College; M.A., Ph.D., Claremont Graduate School.

DENNIS F. MURRAY, Associate Professor of Accounting. B.S., M.S., State University of New York at Albany; Ph.D., University of Massachusetts.

JAMES A. MURRAY, Associate Professor Adjunct of Public Affairs. B.S., University of New Mexico; M.B.A., Harvard University; M.A., Ph.D., University of Oregon.

WILLIAM D. MURRAY, Associate Dean, College of Business and Administration and Graduate School of Business Administration; Professor of Information Systems; Professor of Electrical Engineering and Computer Science. B.S., Eng.Sc.D., New York University. Professional Engineer: Colorado, New York.

SALLY NATHENSON-MELIA, Assistant Professor of Education. B.S., M.A., Ph.D., State University of New York, Albany; Ph.D., University of Southern California.

BRUCE R. NEUMANN, Professor of Accounting and Health Administration. B.S., M.S., University of Minnesota; Ph.D., University of Illinois.

JAMES G. NIMMER, Assistant Professor of Psychology. B.A., University of Wisconsin; M.S., Ph.D., Virginia Polytechnic Institute and State University.

THOMAS J. NOEL, Associate Professor of History. B.A., M.A., University of Denver; M.A., Ph.D., University of Colorado.

PAUL C. NOVAK, Instructor in Electrical Engineering and Computer Science. B.S., M.S., Colorado State University.

EDWARD J. O’CONNOR, Professor of Management. B.S., Boston College; M.B.A., Harvard Business College; Ph.D., University of Akron.

RICHARD H. O’LEON, Professor of Sociology. B.S., University of Utah; M.S., Brigham Young University; Ph.D., Washington State University.

KEVIN C. O’NEILL, Assistant Professor of French. B.A., University of California, Santa Barbara; M.A., Ph.D., University of California, Berkeley.

JAY OPLINGER, Senior Instructor in Electrical Engineering. B.S., M.S.,
University of Colorado.

J. KENNETH ORTEGA, Associate Professor of Mechanical Engineering. B.S., M.S., Ph.D. University of Colorado.

E. SAMUEL OVERTON, Associate Professor of Public Affairs. B.A., University of Delaware; M.P.A., Ph.D., University of Pittsburgh.

JOHN D. PARR, Associate Professor Adjunct of Public Affairs. B.A., Purdue University; J.D., University of Denver.

PAUL J. PATINCA, Instructor in Management. B.S., Fordham University; M.P.S., University of Colorado; Ph.D., Purdue University.

STANLEY E. PAYNE, Professor of Mathematics. B.A., Hastings College; M.S., Ph.D., Florida State University.

ELIHU H. PEARLMAN, Professor of English. B.A., Cornell University; M.A., Ph.D., Harvard University.

LEONARD M. PERLMUTTER, Professor Adjunct of Public Affairs. B.A., University of Colorado.

GEORGE N. PETERS, Assistant Professor Adjunct of Philosophy. B.S., Kansas State University; M.D., Northwestern University Medical School.

ELLENE B. PHELPS, Senior Instructor in Computer Science. B.S., M.S., Central Michigan University.

JEAN PHILLIPS, Associate Professor Emeritus of English. M.A., University of Colorado; B.A., Ph.D., University of Denver.

MARK R. POGREBIN, Professor of Public Affairs. B.S., University of Houston; M.A., City University of New York; Ph.D., University of Iowa.

WILLIAM S. POLLARD, JR., Professor of Civil Engineering. B.S., M.S., Purdue University; Professional Engineer: Colorado, Illinois, and 43 other states.

ERIC D. POOLE, Professor of Public Affairs. B.S., Virginia Commonwealth University; M.A., Ph.D., Washington State University.

ERNEST O. PORPS, Professor of Fine Arts. B.Arch., M.Arch., University of Illinois; M.F.A., School of the Art Institute. Chicago.


JOHN M. PROSSER, Professor of Architecture. B.S., University of Kansas; M.Arch., Carnegie Mellon University.

LIBBY M. QUATTROMANI, Assistant Professor of Education. B.S., M.A., University of Colorado; Ed.D., University of San Francisco.

DUANE QUATT, Professor of Anthropology. B.A., M.A., University of Michigan; Ph.D., University of Colorado.

CELIA M. RABINOVITCH, Assistant Professor of Fine Arts. B.F.A., B.A./B.F.A., University of Manitoba (Canada); M.F.A., University of Wisconsin; Ph.D., Magill University (Canada).

BARRABA RADOSEVICH, Instructor in Finance. B.S., University of Nebraska; M.A., University of Denver.

CHANDRA SEKARAN RAJAM, Assistant Professor of Management. B.Tech., M.B.A., Indian Institute of Technology; Ph.D., Pennsylvania State University.

HERBERT RENO, Associate Professor Emeritus of Electrical Engineering. B.S., M.S., University of Colorado.

ROBBIE D. RHINE, Professor of Communication. B.A., Southwestern College; M.A., University of Colorado; Ph.D., University of Wisconsin.

LYNN K. RHOADES, Associate Professor of Education. B.S., M.S., Ed.D., Indiana University.

ALAN RICE, Assistant Professor of Physics. B.S., M.S., Eng.Sc.D., Columbia University.

CHARLES A. RICE, Instructor in Management. B.S., Syracuse University; M.B.A., University of Denver.

MYRA L. RICH, Associate Professor of History. A.B., Radcliffe College; M.A., Ph.D., Yale University.

BLANDINE M. RICKERT, Associate Professor of French. Licence es-lettres, University of Besancon (France); M.A., Ph.D., University of Minnesota.

VALENTINE E. RIEGERT, Senior Instructor in Electrical Engineering and Computer Science. Cand.Ing., University of Riga (Latvia); Dipl.Ing., Karlsruhe Institute of Technology (Germany); M.S., University of Denver. Professional Engineer: Colorado.

LEO C. RIETHMAYER, Professor Emeritus of Public Affairs. B.A., M.A., Texas Technological College; Ph.D., University of Iowa.

FRANCISCO A. RIOS, Associate Professor of Spanish. B.A., University of Denver; Ph.D., University of Oklahoma.

FRANZ L. ROEHMANN, Professor of Music. B.S., State University of New York; M.Mus., Ed.D., University of Illinois.

WILLIAM R. ROEMISH, Associate Professor Adjunct of Electrical Engineering and Computer Science. B.S., Union College; M.S., Ph.D., University of Colorado. Professional Engineer: Colorado.

EDITH R. ROGERS, Professor Emeritus of Spanish. B.A., M.A., University of Denver; Ph.D., University of Colorado.

DOUGLAS A. ROSS, Associate Professor of Electrical Engineering and Computer Science. B.S., M.S., Seattle University; Ph.D., University of Washington.

JAY A. ROTHMAN, Senior Instructor in Electrical Engineering and Computer Science. B.A., Reed College; M.S., Ph.D., New York University.

MARY LOU ROTTMAN, Assistant Professor Adjunct of Biology. B.A., Ph.D., University of Colorado.

JOHN W. RUITE, Assistant Professor Adjunct of Mathematics. B.S., M.S., Wichita State University; Ph.D., Colorado State University.

JOHN D. Ruhnka, Associate Professor of Management and Business Law. B.A., Swarthmore College; M.B.A., University of Pennsylvania; J.D., Yale School of Law.

THOMAS F. RUSSELL, Associate Professor of Mathematics. A.B., Princeton University; M.S., Ph.D., University of Chicago.

JENNIFER RYAN, Assistant Professor of Mathematics. B.S., Carleton University (Canada); M.S., Ph.D., Cornell University.

JOEL SALZBERG, Associate Professor of English. B.A., City College of New York; M.A., Indiana University; Ph.D., University of Oklahoma.

NANCY SANDERS, Assistant Professor of Education. B.A., Colorado College; M.A., Stanford University.

DEANNA SANS, Assistant Professor of Education. B.A., M.A., University of Michigan; B.S.E., University of Newcastle (England); Ed.D., University of Alabama.

KIM DUBIN Saporito, Assistant Professor Adjunct of Architecture. B.F.A., Cornell University; M.Arch., University of Colorado.

PAUL A. SAPORITO, Coordinator of Urban Design and Associate Professor of Architecture and Urban Design. B.Arch., Cornell University; M.Arch., University of Colorado.

MARILYN SARGENT, Professor Adjunct of Architecture. B.A., University of California, Berkeley; Ph.D., Washington University.

Marilyn Scammann, Assistant Professor of Education. B.S., Denison University; M.Ed., University of New Hampshire; Ph.D., University of Minnesota.

PETER V. SCHAEFFER, Director and Associate Professor of Urban and Regional Planning. lic. civ. publ., University of Zurich (Switzerland); M.A., Ph.D., University of Southern California.


DANIEL J. SCHLAR, Professor of Sociology. B.D., Eden Seminary; B.S., M.S., Ph.D., University of Missouri.

CONNIE SCHLIEBNER, Assistant Professor of Education. B.S., Kent State University; M.S., Ph.D., Syracuse University.
CHARLES G. SCHMIDT, Professor of Geography. B.A., Sonoma State College; M.A., University of Illinois; Ph.D., University of Washington.

DONALD L. SCHMIDT, Associate Professor of Spanish. B.A., College of Wooster; M.A., Ph.D., University of Kansas.

PETER A. SCHNEIDER, Director and Professor of Architecture. B.Arch., University of Cape Town (South Africa); Dipl., Ruth Prowse Art Center.

SUZANNE P. SCHNEIDER, Senior Instructor in English. B.A., M.A., Ph.D., University of Colorado.

WILLIAM A. SEASE, Associate Professor of Education. B.S., M.Ed., Ed.D., University of Missouri.

CARSTEN E. SEECCAMP, Associate Professor of German. B.S., Southern Connecticut State College; M.A., Ph.D., Johns Hopkins University.

PANKAJ K. SEN, Associate Professor of Electrical Engineering and Computer Science. B.S., Jadavpur University (India); M.S., Ph.D., Technical University of Nova Scotia (Canada). Professional Engineer: Colorado.

KURT SERA-KRAIGER, Assistant Professor of Psychology. B.A., University of Cincinnati; M.A., Ph.D., Ohio State University.

MANUEL G. SERAPIO, Assistant Professor of Marketing and International Business. B.A., Ateneo de Manila University (Philippines); M.B.A., University of Hawaii, Manoa; Ph.D., University of Illinois, Urbana-Champaign.

NANCY L. SHANKLIN, Assistant Professor of Education. B.S., M.S., Ed.D., Indiana University.

RAMALINGAM SHANMUGAM, Associate Professor of Mathematics. B.S., Loyola College (India); M.S., Presidency College (India); M.S., Brigham Young University; M.S., Rensselaer Polytechnic Institute; Ph.D., Temple University.

SHIELA SHANNON, Assistant Professor of Education. B.S., M.A., University of Texas; Ph.D., Stanford University.

DIANE WILK SHIRVANI, Assistant Professor of Architecture. B.S., University of Southern California; M.Arch., Yale University.


GEORGE J. SIEMENS, Professor Emeritus of Biology. B.S., M.S., University of Manitoba (Canada); Ph.D., University of Toronto (Canada).

HERMAN SIEVERING, Professor of Physics: Director, Center for Environmental Sciences. B.S., M.S., Ph.D., University of Illinois.

CAROLYN H. SIMMONS, Associate Dean, College of Liberal Arts and Sciences; Professor of Psychology. B.A., Wellesley College; M.A., Ph.D., University of Kentucky.

WILLIAM R. SIMMONS, Assistant Professor of Physics. B.S., M.S., Ph.D., University of Colorado.

BURTON SIMON, Assistant Professor of Mathematics. B.S., Cornell University; Ph.D., University of Michigan, Ann Arbor.

MOLLY K. SINGER, Instructor in Fine Arts. B.A., M.A., University of Colorado.

JACK E. SMITH, Professor Adjunct of Anthropology. B.A., University of Colorado; Ph.D., University of California, Los Angeles.

MARLENE A. SMITH, Assistant Professor of Quantitative Methods. B.A., Denison University; Ph.D., University of Florida.

ROBERT L. SMITH, Professor of Education. B.S., Ed.S., Western Michigan University; Ph.D., University of Michigan.

W. JAMES SMITH, Professor of Economics. B.S., Colorado State University; M.A., University of Michigan; Ph.D., University of Colorado.


JUDITH J. STALNAKER, Assistant Professor of Civil Engineering. B.S., Iowa State University; M.S., Ph.D., University of Colorado; Professional Engineer: Colorado.

MARILYN L. H. STEMBER, Associate Professor of Sociology. B.S.N., Augustana College; M.S.N., University of Washington; M.A., Ph.D., University of Colorado.

GARY S. STERN, Professor of Psychology. B.A., New York University; M.A., Alfred University; Ph.D., University of Massachusetts.

DONALD L. STEVENS, Dean, College of Business and Administration and Graduate School of Business Administration; Professor of Finance. B.A., M.B.A., Ph.D., Michigan State University.

ELLEN STEVENS, Assistant Professor of Education. B.A., California State College; Ph.D., Stanford University.

RICHARD E. STEVENS, Professor of Geography. B.S., Concordia Teachers College; M.A., University of Colorado; Ph.D., University of Kansas.

BRADLEY J. STITH, Assistant Professor of Biology. B.S., Ohio State University; Ph.D., Washington State University.

DONATO A. STRAMMELLO, Assistant Professor Adjunct of Urban and Regional Planning. B.A., Trinity College; M.A., George Washington University.

OREN G. STROM, Acting Dean, College of Engineering and Applied Science; Associate Professor of Civil Engineering. B.S., South Dakota State University; M.S., University of Wisconsin; Ph.D., University of Texas, Austin.

JEROME S. STROMBERG, Associate Professor Adjunct of Anthropology. B.A., Wheaton College; M.A., Ph.D., University of Minnesota.

LOUISE T. STWALLEY, Instructor and Reference Librarian, Auraria Library. B.S.Ed., University of Colorado; M.A., University of Denver.

MARY ROSE SULLIVAN, Professor of English. B.A., Emmanuel College; M.A., Catholic University; Ph.D., Boston University.

LARRY SVOBODA, Part-time Instructor in Urban and Regional Planning. B.A., M.A., University of Colorado.

ROLAND A. SWEET, Professor of Mathematics. B.S., Florida State University; M.S., Ph.D., Purdue University.

WON JIN TAE, Assistant Professor of Architecture. B.C.E., M.Arch., Yonsei University (Korea); M.Arch., University of Michigan.

DEAN TAYLOR, Professor of Finance. B.S., University of Wisconsin; M.S., London School of Economics (England); M.B.A., Ph.D., University of Chicago.

LYN TAYLOR, Assistant Professor of Education. A.B., Rider College; M.A., Ph.D., University of New Mexico.

RICHARD O. TAYLOR, Senior Instructor in Electrical Engineering and Computer Science. B.S., University of Pittsburgh; M.S., University of Colorado. Professional Engineer: Colorado.

HARRY TEAGUE, Associate Professor Adjunct of Architecture. B.A., Dartmouth College; M.Arch., Yale University.

THADDEUS TECZA, Senior Instructor in Political Science. B.A., Roosevelt University; M.A., Ph.D., University of Colorado.

MARTIN A. TESSMER, Assistant Professor and Instructional Designer, Media Production, Auraria Library; Assistant Professor of Education. B.A., M.A., M.S., Southern Illinois University; Ph.D., Florida State University.

JOE E. THOMAS, Chair and Professor of Electrical Engineering and Computer Science. B.S., University of Wyoming; M.S., University of Idaho; Ph.D., University of Denver. Professional Engineer: Colorado, Idaho, Washington.

STEPHENV C. THOMAS, Associate Professor of Political Science. B.A., San Jose
State University; M.A., Ph.D. Stanford University.

RUTH THORNE-THOMSEN, Associate Professor of Fine Arts. B.A., Columbia College; B.F.A., University of Southern Illinois; M.F.A., The School of the Art Institute.

PETER L. THORPE, Professor of English. B.A., M.A., Ph.D., University of Washington.

LINDA D. TIEFJEN, Instructor and Coordinator of Circulation Services, Auraria Library. B.A., Metropolitan State College; M.A., University of Denver.

DIANA F. TOMBACK, Associate Professor of Biology. B.A., M.A., University of California, Los Angeles; Ph.D., University of California, Santa Barbara.

KENNETH TORP, Executive Director of The Centers. B.A., City College of New York.

JOHN A. TRAPP, Associate Professor of Mechanical Engineering. B.S., Long Beach State College; M.S., Ph.D., University of California.

DUANE K. TROXEL, Associate Dean, School of Education; Associate Professor of Education. B.S., Moorhead State University; M.Ed., University of Hawaii; Ed.D., Temple University.

FRED C. TRUSSELL, Senior Instructor in Chemistry. B.A., B.S., University of Missouri, Kansas City; M.S., Ph.D., Iowa State University.

JOHN TURNER, Instructor in Finance. B.S., M.A., Ball State University; Ph.D., St. Louis University.

RICHARD P. VAN DE WEGHE, Associate Professor of English. B.A., Western Michigan University; M.A., Ph.D., Michigan State University.

ANDREAS S. VLAHINOS, Assistant Professor of Civil Engineering. B.S., National Technical University; M.S., Ph.D., Georgia Institute of Technology.

MARGIE WAIT, Instructor and State Publications Cataloger, Auraria Library. B.A., Hastings College; M.A., University of Denver.

EDWARD T. WALL, Professor Emeritus of Electrical Engineering and Computer Science. B.S., Purdue University; M.S., Lehigh University; Ph.D., University of Denver. Professional Engineer: Colorado.

LUCY C. WARE, Senior Instructor in Political Science. B.A., Dickinson College; M.A., University of Colorado.

GLENN A. WEBSTER, Associate Professor of Philosophy. B.A., M.A., Ph.D., University of Washington.

JOHN G. WEIHaupt, Professor of Geology. B.S., M.S., University of Wisconsin, Madison; M.S., Ph.D., University of Wisconsin, Milwaukee.

WILLIAM WENK, Associate Professor Adjunct of Landscape Architecture. B.L.A., Michigan State University; M.L.A., University of Oregon.

WILLIAM A. WEST, Associate Professor of English. B.A., Ohio Wesleyan University; M.A., Columbia University; Ph.D., University of Michigan.

MARIANNE WESTERMAN, Instructor in Finance. B.S., M.B.A., Ohio State University.

ROBERT L. WICK, Assistant Professor and Architecture and Planning Branch Head, Auraria Library. B.F.A., M.A., University of South Dakota; M.A., University of Denver.

BRENT WILSON, Associate Professor of Education. B.S., Ph.D., Brigham Young University.

JON A. WINTERTON, Associate Professor of Communication. B.A., M.A., University of Colorado; Ph.D., Michigan State University.

MARIE E. WIRSING, Professor of Education. B.A., M.A., Ph.D., University of Denver.

RUTHERFORD W. WITTHUS, Instructor and Humanities/Reference Librarian and Head of Archives/Special Collections, Auraria Library. B.A., M.A., M.A.(L.I.M.), University of Denver.

JAMES B. WOLF, Professor of History. A.B., Oberlin College; M.A., San Francisco State College; Ph.D., University of California, Los Angeles.

WILLIAM J. WOLFE, Associate Professor of Electrical Engineering and Computer Science. B.A., Queens College, CUNY; Ph.D., City University of New York.

F. SCOTT WOODARD, Part-time Instructor in Interior Design. B.Arch., University of Texas, Austin.

MUERIEL E. WOODS, Assistant Director for Media and Telecommunication Services, and Assistant Professor Attendant Rank, Auraria Library. B.A., Gustavus Adolphus College; M.A., University of Denver.

LANCE V. WRIGHT, Assistant Professor of Education; Executive Director, Colorado Principals Center. B.A., Roosevelt University; M.A., Ph.D., Loyola University.

TZONG H. WU, Associate Professor of Civil Engineering. B.S., National Taiwan University; M.S., Virginia Polytechnic Institute; Ph.D., Purdue University.

WILLIAM J. WYAND, Instructor in Management and Managerial Economics. B.A., M.A., Pennsylvania State University; J.D., University of Denver; Ph.D., University of Illinois.

KAORU YAMAMOTO, Professor of Education. B.S., University of Tokyo (Japan); M.A., Ph.D., University of Minnesota.

EVELINE L. YANG, Instructor and Social Sciences/Reference Librarian, Auraria Library. B.A., Chung Hsin University (Taiwan); M.A., M.S.L.S., University of Illinois.

MARK A. YARBOROUGH, Assistant Professor of Philosophy. B.A., Berry College; M.A., Ph.D., University of Tennessee.

CLYDE S. ZAIDINS, Professor of Physics. B.S., M.S., Ph.D., California Institute of Technology.

RAYMOND F. ZAMMUTO, Associate Professor of Management. B.S., M.S., Ph.D., University of Illinois, Urbana.
## Index

### A
- Academic calendar ........................................ 2
- Academic honor code and discipline policies .......... 31-32
- Academic policies and regulations ....................... 23-28
- Academic programs ....................................... 7-8
- Academic records, confidentiality of .................... 27-28
- Academic structure (of the University) ................ 7
- Access programs (Education) ............................... 101-102
- Accounting:  
  - Undergraduate program ................................. 80
  - Courses .................................................. 83
  - Graduate program ...................................... 88-89
  - Courses .................................................. 94-95
- Accreditation ............................................. 9
- Adding programs (Education) ............................... 27
- Administration (of campus) ................................ 5
- Administration (of University) ............................ 5
- Admission, notification of ................................ 15
- Admission policies and procedures ....................... 10-16
- Advanced degrees, requirements for .................... 46-47
- Advanced placement ..................................... 23-24
- Advanced standing ....................................... 23
- Affirmative action ....................................... 30
- Afro-American Studies (see Ethnic Studies) ............
- Aging, National Leadership Institute on ................ 9, 261
- Air Force ROTC (see Military Science) .................
- Alumni Association ....................................... 28
- American Indian Studies (see Ethnic Studies) .........
- Anthropology ............................................. 184-185
  - Courses .................................................. 185-188
- Applied Mathematics ..................................... 142-143
- Applied Psychology, Center for ........................ 9
- Architecture and Planning Library ....................... 56
- Architecture and Planning, School of ................... 55-71
- Architecture program .................................... 58-61
  - Courses .................................................. 62-64
- Army ROTC (see Military Science) ........................
- Asian American Studies (see Ethnic Studies) ...........
- Auraria Higher Education Center ........................ 8

### B
- Basic Science, Master of ................................ 188-190
- Bilingual education/English as a second language ..... 109-110
  - Courses .................................................. 111-112
- Biology ...................................................... 190-193
  - Courses .................................................. 191-193
- Book Center ................................................. 28
- Business Administration for Executives, Master of .... 92
- Business Administration, Master of ..................... 87-88
  - Business and Administration, College of, and ....
  - Graduate School of Business Administration ...... 73-98
- Business Law, courses ................................... 83
- Business, undergraduate programs ....................... 76-86

### C
- Calendar, academic ......................................... 2
- Career services ............................................ 30
- Centers and institutes for research, service, and training 9-10
- Centers, institutes, and programs (Public Affairs) .... 261
- Centers, The, (Public Affairs) ........................... 9, 261
- Chancellor, message from ................................ 4
- Chancellor, CU-Denver ................................... 9
- Chemistry ................................................ 193-196
- Courses ................................................... 194-196
- Child care centers ....................................... 30
- Chinese (see Modern Languages) ........................
- Civil Engineering ......................................... 143-148
- Courses ................................................... 145-148
- Clubs and organizations .................................. 35
- College Level Examination Program (CLEP) .......... 24
- Colorado Principals' Center ................................ 9, 102
- Commencement ............................................ 26
- Communication ............................................ 195-198
- Courses ................................................... 197-198
- Community Development, Colorado Center for .......... 9
- Comprehensive final examination (Graduate School) .. 49, 51
- Computational Mathematics Group ...................... 9, 219-220
- Computer laboratories (Architecture and Planning) .... 56-57
- Computer Science courses ................................ 151-153
- Computing Services ...................................... 28-29
- Computing Services users, responsibilities .......... 35
- Concurrent enrollment (two campuses) ................. 22-23
- Cooperative Education, Center for Internships and ... 38-39, 170-171
- Core curriculum, CU-Denver ................................
  - Business .................................................. 77
  - Engineering .............................................. 137
  - Liberal Arts and Sciences .............................. 167-168
  - Counseling and Personnel Services .................. 107-108
  - Courses .................................................. 108-109
  - Course loads ............................................ 23
  - Course modifications ................................... 3
  - Course scheduling and abbreviations .................. 22
  - Credit by examination .................................. 24
  - Criminal Justice, Master of ......................... 286-287
  - Courses .................................................. 287
  - Curriculum and Instruction program ................. 109-117

### D
- Degrees offered, graduate ................................ 43
- Disabled Student Services ................................ 30
- Doctor of Philosophy ...................................... 50-52
- Dropping courses ......................................... 27
- Drug-free workplace ...................................... 30
- Dual degree, MBA/BA ..................................... 93
- Dual degree, MBA/MS ..................................... 93
- Dual degree, MSHA/MBA .................................. 93

### E
- Early Childhood Education and Early Childhood Special Education ................................. 117-118
- Courses ................................................... 118-119
- Economics ................................................ 198-203
- Courses ................................................... 199-203
- Education, School of ..................................... 101-131
- Educational Administration, Curriculum, and Supervision .................. 119-127
- Courses ................................................... 121-122
Mechanical Engineering ........................................ 157-160
Courses .................................................. 158-160
Media and Telecommunications, Library ...................... 40
Military personnel, tuition .................................. 19
Military Science, courses .................................. 255-256
Military service and ROTC, credit for ........................ 24
Minimum academic preparation standards (MAPS) ........... 11
Modern Languages, Department of .......................... 227-234
Courses ............................................... 228-234
MSC pooled courses ....................................... 22, 165
Music ................................................. 176-180
Courses .............................................. 178-180

N
National Veterans Training Institute .......................... 10
Neuroscience program ....................................... 173
Non-degree student admission .............................. 14, 16

O
Ombuds Office ............................................. 30
Operations Management ......................................
Undergraduate program .................................... 82
Courses ................................................ 85
Graduate courses ......................................... 98
Orientation .............................................. 22

P
Pass/fail procedure ........................................ 24-25
Philosophy ............................................... 234-236
Courses .............................................. 235-236
Photography (see Fine Arts) ................................
Physics ............................................... 236-238
Courses .............................................. 237-238
Political Science .......................................... 238-243
Courses .............................................. 239-243
Pre-education ........................................... 171-172
Psychology ............................................... 243-246
Courses .............................................. 244-246
Public Administration, courses .............................. 264-266
Public Administration, Doctor of Philosophy ............... 263-264
Public Administration, Master of .......................... 261-262
Public Administration, Master of — Executive MPA Option .... 262
Public Affairs, Graduate School of ........................ 259-267
Public-Private Sector Cooperation, Center for ............. 261

Q
Quantitative Methods ......................................
Undergraduate courses .................................... 86
Graduate courses ........................................ 98

R
Reading and Writing ....................................... 114-115
Courses .............................................. 115
Regents, Board of ....................................... 5
Registration ............................................ 21-23
Registration, graduate .................................... 46
Registration with Metropolitan State College ................. 22
Research .............................................. 8-9
Research and Evaluation Methodology ....................... 128-129
Research in Rhetoric, Center for .......................... 10
Residency classification ................................... 19
Resource Access Project, Region VIII ......................... 10, 102
ROTC (see Military Science) ................................
Russian (see Modern Languages) ..........................