Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires 12 course credits in philosophy approved by the director of graduate studies in philosophy. Programs are tailored to meet the interests and needs of the student.

Physical Education and Recreation
See Kinesiology.

Physical Therapy
Contact Information—Physical Therapy Program Office, MMC 388, University of Minnesota, Minneapolis, MN 55455 (612-624-2262; fax 612-625-7192; physther@umn.edu)
www.physther.med.umn.edu

For up-to-date graduate faculty listings, see
www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
James R. Carey, SM
Richard P. DiFabio, SM
Robert P. Patterson, AM

Associate Professor
LaDora V. Thompson, SM

Assistant Professor
Dawn A. Lowe, SM
Paula M. Ludewig, SM

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The physical therapy program, a division within the Department of Physical Medicine and Rehabilitation, offers a professional doctoral degree in physical therapy (D.P.T.). Physical therapy is a health care discipline involved with the study and rehabilitation of movement impairments such as muscular weakness, joint stiffness, and pain, which can lead to functional problems affecting self care, employment, ambulation, etc. Graduates are prepared to promote proper health care and quality of living by maximizing human movement following disease or injury or by preventing its loss. The program requires three years of year-round graduate study. Academic coursework and research activity are completed during the first seven semesters. The final two semesters are devoted to clinical internships.

Clinical Curriculum—Students complete up to 40 weeks of clinical internships in addition to clinical clerkships imbedded in the academic curriculum. The full-time internships occur during the third year of the program. Each student completes clinical affiliations in the following areas: acute hospital, outpatient, rehabilitation, and specialty area. These are under direct supervision of experienced clinical faculty and give each student the opportunity to combine theoretical skills with practical experience. Beyond direct patient care, students also develop skills and knowledge related to administration, management and supervision, education, and consultation. Graduates of the program are eligible to apply for state registration or licensure according to the laws of individual states.

Prerequisites for Admission—To be considered for admission, the student must complete a baccalaureate degree by June 1 of the year of application (no preferred major); an operational standard GPA of 3.00 for overall coursework and a 3.00 in the physical therapy prerequisite coursework are the preferred minimum; and the student must complete at least 100 hours of volunteer or work experience in a physical therapy setting. Applications received after June 1 will be considered for the following year. Information and applications, including a list of prerequisite coursework, are available at www.physther.med.umn.edu.

Special Application Requirements—Submission of GRE scores is required. For international students, a TOEFL score of at least 550 is required and the TSE is highly recommended (score of at least 50). The D.P.T. program accepts only applications completed online at www.physther.med.umn.edu.

Courses—Please refer to Physical Therapy (PT) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx courses towards degree requirements is subject to adviser and director of graduate studies approval.

D.P.T. Degree Requirements
The program requires 141 major field credits, of which 95 are core academic credits and 46 are clinical internship credits; 9 credits of research are included and an oral presentation based on this research culminates the project. No minor or related field is required. Students must maintain a cumulative GPA of 2.80 while in the program.

Language Requirements—None.

Physics
Contact Information—Physics Program, School of Physics and Astronomy, University of Minnesota, 145 Tate Laboratory of Physics, 116 Church Street S.E., Minneapolis, MN 55455 (612-624-3466; fax 612-624-4578; grad@physics.umn.edu; www.physics.umn.edu).
Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Degree Programs and Faculty

Ph.D. Degree Requirements

The Ph.D. requires a minimum of 40 credits, including classical physics (Phys 5011-5012), quantum mechanics (Phys 5001-5002), and two semesters of a seminar in the student’s research area. Any course will satisfy the minor or supporting program requirement.

Minor Requirements for Students Majoring in Other Fields

A physics minor requires a background in differential and integral calculus and one year of calculus-level college physics. For the master’s minor, students must complete a minimum of 6 credits in physics.

Language Requirements

—There is no language requirement. However, in some instances the thesis adviser may require a reading knowledge of one or more foreign languages if justified by the nature of the topic.

Final Exam

—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields

A physics minor requires a background in differential and integral calculus and one year of calculus-level college physics. For the master’s minor, students must complete a minimum of 6 credits in physics.

Required Orientation

—During the two weeks before the beginning of fall semester, new graduate students are expected to participate in the department orientation program. This includes TA training sessions, which is required if your financial support comes from TA assignments.

Use of 4xxx Courses

—Use of 4xxx physics courses is permitted for either major or minor degree requirements.

M.S. Degree Requirements

The M.S. requires a minimum of 20 course credits (Plan A) or 30 course credits (Plan B), including classical physics (Phys 5011-5012) or quantum mechanics (Phys 5001-5002) and a minimum of 6 credits in a minor or related field; Plan A also requires 10 thesis credits. The minor or related field requirement may be satisfied by completion of courses in one or two areas outside the specialization; some or all of these courses may be in physics.

Language Requirements

—There is no language requirement. However, in some instances the thesis adviser may require a reading knowledge of one or more foreign languages if justified by the nature of the topic.

Final Exam

—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields

A physics minor requires a background in differential and integral calculus and one year of calculus-level college physics. For the master’s minor, students must complete a minimum of 6 credits in physics.

Ph.D. Degree Requirements

The Ph.D. requires a minimum of 40 credits, including classical physics (Phys 5011-5012), quantum mechanics (Phys 5001-5002), and two semesters of a seminar in the student’s research area. Any course will satisfy the minor or supporting program requirement.

Language Requirements

—There is no language requirement. However, in some instances the thesis adviser may require a reading knowledge of one or more foreign languages if justified by the nature of the topic.

Minor Requirements for Students Majoring in Other Fields

A physics minor requires a background in differential and integral calculus and one year of calculus-level college physics. For the doctoral minor, students must complete a minimum of 12 credits in physics, including either the classical physics sequence (Phys 5011-5012) or the quantum mechanics sequence (Phys 5001-5002).

Physiology

—See Cellular and Integrative Physiology.

Planning

—See Urban and Regional Planning.

Plant Biological Sciences

Contact Information

Plant Biological Sciences Graduate Program, University of Minnesota, 250 Biological Sciences Center, 1445 Gortner Avenue, St. Paul, MN 55108 [612-625-4222; fax 612-625-1738; phipps@cb.s.umn.edu].

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.aspx.

Regents Professor

Ronald L. Phillips, Agronomy and Plant Genetics, SM

Professor

Deborah L. Allan, Soil, Water, and Climate, SM
Judith G. Berman, Genetics, Cell Biology, and Development, SM
David D. Biesboer, Plant Biology, SM
Robert M. Brambl, Plant Biology, SM
Iris D. Charvat, Plant Biology, SM
Jerry D. Cohen, Horticultural Science, SM

Edward J. Cushing, Ecology, Evolution, and Behavior, SM
Ananth Das, Biochemistry, Molecular Biology, and Biophysics, SM
Gary M. Gardner, Horticultural Science, SM
Burle G. Gengenbach, Agronomy and Plant Genetics, SM
Florence K. Gleason, Plant Biology, SM
Peter H. Graham, Soil, Water, and Climate, SM
Robert J. Jones, Agronomy and Plant Genetics, SM
Paul A. Lefebvre, Plant Biology, SM
Pen Hsiang Li, Horticultural Science, SM
Albert H. Markhart III, Horticultural Science, SM
David J. McLaughlin, Plant Biology, SM
Neil E. Olczewski, Plant Biology, SM
James A. Perry, Forest Resources, SM
Peter B. Reich, Forest Resources, SM
Michael J. Sadowsky, Soil, Water, and Climate, SM
Ruth G. Shaw, Ecology, Evolution, and Behavior, SM
Carolyn D. Silflow, Plant Biology, SM
D. Peter Snustad, Plant Biology, SM
David A. Somers, Agronomy and Plant Genetics, SM
Joseph R. Sowokinos, Horticultural Science, SM
Kate VandenBosch, Plant Biology, SM
Clifford M. Wetmore, Plant Biology, SM
Susan M. Wick, Plant Biology, SM
Nevin D. Young, Plant Pathology, SM

Adjunct Professor

John W. Gronwald, Agronomy and Plant Genetics, SM
Deborah A. Samac, Plant Pathology, SM
Carroll P. Vance, Agronomy and Plant Genetics, SM

Associate Professor

J. Stephen Gaunt, Plant Biology, SM
Susan I. Gibson, Plant Biology, SM
Jane Glazebrook, Plant Biology, SM
Fumiaki Katagiri, Plant Biology, SM
Michael D. Marks, Plant Biology, SM
Georgiana May, Plant Biology, SM
Gary J. Maehlbauer, Agronomy and Plant Genetics, SM
Alan G. Smith, Horticultural Science, SM
Cindy B. Tong, Horticultural Science, SM

Adjunct Associate Professor

Les J. Szabo, Plant Pathology, SM

Assistant Professor

James A. Braden, Plant Pathology, SM
Jeannine Cavender-Bares, Ecology, Evolution and Behavior, SM
Julie Ettersson, Plant Biology, SM
Julie Gray, Biology, Duluth, SM
William Gray, Plant Biology, SM
Mia Ni, SM
Anton A. Sanderfoot, Plant Biology, SM
Nathan Springer, Plant Biology, SM
Pen Hsiang Li, Horticultural Science, SM

Adjunct Assistant Professor

David Garvin, Agronomy and Plant Genetics, SM
Rodney Venterea, Soil, Water, and Climate, SM

Other

Arun Goyal, Biotechnology Research Program, Duluth, SM
Kevin Silverstein, Plant Biology, M2
Thomas K. Soulen, Plant Biology, AM
Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—Plant biological sciences encompasses all aspects of the basic biology of both higher and lower plants. Major emphases include molecular and physiological approaches to development; physiological, structural, and functional studies at the cellular and organismal levels; systematic and evolutionary biology; and molecular genetics and applied biotechnology. Students study plants from the subcellular and molecular to the whole plant and community levels of biological organization. They also have opportunities for laboratory and field research at state, national, and international levels. Each student’s program is planned to meet individual requirements within the framework of a multidisciplinary core of coursework. Seminars are an integral part of the program.

Prerequisites for Admission—Prospective students are expected to have completed a year of coursework in at least three of the following four areas: differential and integral calculus; organic and inorganic chemistry; biology; and physics. For students with demonstrated ability, background deficiencies, as determined by the admissions committee, can be made up during the first year of graduate studies. All admitted students are assigned to an advisor in the graduate program before they begin their studies.

Special Application Requirements—Applicants must submit scores from the General Test of the GRE, three letters of recommendation from persons familiar with their scholarship and research potential, a complete set of official transcripts, and a clearly written statement of career interests, goals, and objectives. Students may apply at any time; however, submission of all application materials by January 1 is strongly encouraged to ensure priority consideration for fellowships and teaching assistantships awarded for the next academic year. Students can be admitted any semester. Students accepted into the department with a B.S. degree are admitted into the M.S. degree program. After a minimum of two semesters, students must be corrected during the first year of the graduate program. All students accepted into the department with a B.S. degree are admitted into the M.S. degree program. After a minimum of two semesters, students who qualify may elect to change their degree status to a Ph.D. program. Criteria for the change include scholastic standing, potential for success in completing a Ph.D., and writing competency. Such a change in status must be approved by the student’s advisory committee and the director of graduate studies. Ph.D. applicants must satisfy all the prerequisites for the master’s degree program in plant pathology or have a master’s degree in plant pathology or in a field of natural science.

Curriculum—Plant pathology focuses on the biology of plant-microbe interactions, and incorporates research spanning the biochemical, molecular, genetic, physiological, whole organism, population, and community levels of biological organization. Plant pathology interfaces with all plant science disciplines, and with food sciences, veterinary medicine, and ecology. Areas of concentration include molecular plant pathology (offered as a special emphasis), plant disease management, biological control of plant disease, forest pathology and microbial degradation of wood, microbial ecology, population biology, plant-microbe interactions, disease resistance, host-parasite coevolution, environmental pollution and climate change, plant-microbe mutualisms, and virology. Students have opportunities for laboratory and field research locally as well as nationally and internationally. The course of study varies with the requirements of the area of concentration and interests of the student. Students who choose the emphasis in molecular plant pathology enhance their ability to design and use molecular approaches to investigate plant disease, increase basic knowledge, and develop new strategies for disease control.

Prerequisites for Admission—Master’s degree applicants must have a sound college background in the basic biological and physical sciences and mathematics, including 35 semester credits in biology with at least one course in each of the following areas: botany, zoology, genetics, plant physiology, and microbiology. Applicants must also have completed at least one course in inorganic chemistry, organic chemistry, biochemistry, and physics. If deficiencies exist in the prerequisites, they must be corrected during the first year of the graduate program. All students accepted into the department with a B.S. degree are admitted into the M.S. degree program. After a minimum of two semesters, students who qualify may elect to change their degree status to a Ph.D. program. Criteria for the change include scholastic standing, potential for success in completing a Ph.D., and writing competency. Such a change in status must be approved by the student’s advisory committee and the director of graduate studies. Ph.D. applicants must satisfy all the prerequisites for the master’s degree program in plant pathology or have a master’s degree in plant pathology or in a field of natural science.

Curriculum—Plant Pathology

Contact Information—Department of Plant Pathology, University of Minnesota, 495 Borlaug Hall, 1991 Buford Circle, St. Paul, MN 55108 (612-625-8200; mna@umn.edu)

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
Robert A. Blanchette, SM
Robert Morgan Brambl, SM
Linda L. Kinzel, SM
Sagar V. Kraupa, SM
Philip O. Larsen, SM
Benham E. Lockhart, SM
David H. MacDonald, SM
James A. Percich, SM
Brian J. Steffenson, SM
Carol E. Windels, SM
Nevin D. Young, SM
Richard J. Zeyen, SM

Adjunct Professor
Martin Carson, SM
H. Corby Kistler, SM
James Kolmer, M2
Deborah A. Sarnac, SM

Associate Professor
Senyu Chen, M2
Ruth Dill-Macky, SM
James E. Kurle, SM

Adjunct Associate Professor
Yue Jin, M2
Les F. Szabo, M2

Assistant Professor
James M. Bradeen, M2
Charla Hollingsworth, M2

Adjunct Assistant Professor
Jennifer Juzwik, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—Plant Biological Sciences (PBS) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Inclusion of 4xx course in degree program forms is subject to adviser and director of graduate studies approval.

M.S. Degree Requirements
Course programs are planned in consultation with an advisory committee. Students are expected to take a minimum of four courses in the major in addition to the two 1-credit current topics courses taken during their first year.

Students participate in a teacher-training program and then serve as a teaching assistant for one semester. Regular attendance at the weekly Plant Biological Sciences Colloquium seminars is expected.

Plan A: students write a thesis proposal and present the results of their research at a colloquium seminar. Plan B: students develop a thesis proposal.

Language Requirements—None, except as specified by a faculty adviser in consultation with the student.

Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—A master’s minor requires a minimum of 6 credits approved by the director of graduate studies.

Ph.D. Degree Requirements
Doctoral requirements are the same as those for a master’s degree. In addition, a dissertation proposal and the presentation of two seminars are required.

Language Requirements—None, except as specified by a faculty adviser in consultation with the student.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires a minimum of 12 credits approved by the director of graduate studies.

Plant Pathology

Curriculum

Contact Information—Department of Plant Pathology, University of Minnesota, 495 Borlaug Hall, 1991 Buford Circle, St. Paul, MN 55108 (612-625-8200; mna@umn.edu)

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
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David H. MacDonald, SM
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Nevin D. Young, SM
Richard J. Zeyen, SM

Adjunct Professor
Martin Carson, SM
H. Corby Kistler, SM
James Kolmer, M2
Deborah A. Sarnac, SM

Associate Professor
Senyu Chen, M2
Ruth Dill-Macky, SM
James E. Kurle, SM

Adjunct Associate Professor
Yue Jin, M2
Les F. Szabo, M2

Assistant Professor
James M. Bradeen, M2
Charla Hollingsworth, M2

Adjunct Assistant Professor
Jennifer Juzwik, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—Plant pathology focuses on the biology of plant-microbe interactions, and incorporates research spanning the biochemical, molecular, genetic, physiological, whole organism, population, and community levels of biological organization. Plant pathology interfaces with all plant science disciplines, and with food sciences, veterinary medicine, and ecology. Areas of concentration include molecular plant pathology (offered as a special emphasis), plant disease management, biological control of plant disease, forest pathology and microbial degradation of wood, microbial ecology, population biology, plant-microbe interactions, disease resistance, host-parasite coevolution, environmental pollution and climate change, plant-microbe mutualisms, and virology. Students have opportunities for laboratory and field research locally as well as nationally and internationally. The course of study varies with the requirements of the area of concentration and interests of the student. Students who choose the emphasis in molecular plant pathology enhance their ability to design and use molecular approaches to investigate plant disease, increase basic knowledge, and develop new strategies for disease control.

Prerequisites for Admission—Master’s degree applicants must have a sound college background in the basic biological and physical sciences and mathematics, including 35 semester credits in biology with at least one course in each of the following areas: botany, zoology, genetics, plant physiology, and microbiology. Applicants must also have completed at least one course in inorganic chemistry, organic chemistry, biochemistry, and physics. If deficiencies exist in the prerequisites, they must be corrected during the first year of the graduate program. All students accepted into the department with a B.S. degree are admitted into the M.S. degree program. After a minimum of two semesters, students who qualify may elect to change their degree status to a Ph.D. program. Criteria for the change include scholastic standing, potential for success in completing a Ph.D., and writing competency. Such a change in status must be approved by the student’s advisory committee and the director of graduate studies. Ph.D. applicants must satisfy all the prerequisites for the master’s degree program in plant pathology or have a master’s degree in plant pathology or in a field of natural science.
Special Application Requirements—GRE scores are required for all students and TOEFL or IELTS scores are required for international students. A clearly written statement of career interests as well as three letters of recommendation are required of all students and must be submitted to the department at the time of application. Students may apply at any time; however, submission of all application materials by January 15 will ensure priority consideration for fellowships and research assistantships for the next academic year. Students can be admitted any semester.

Courses—Please refer to Plant Pathology (PlPa) in the course section of this catalog for courses pertaining to the program, or to the department Web site at www.plpa.agri.umn.edu.

Use of 4xxx Courses—For M.S. Plan A and Ph.D. students, 4xxx courses are not permitted toward degree requirements.

M.S. Degree Requirements

Plan A (thesis) and Plan B (without thesis) both require a minimum of 14 course credits in plant pathology and 6 course credits in a minor or related field. In addition, Plan A requires 10 thesis credits and Plan B requires 8 project or elective credits. Regular attendance at weekly plant pathology seminars is expected. Internships are encouraged as part of the graduate experience; financial support is available on a competitive basis for international or domestic internships. A detailed overview of course offerings and requirements, including additional details on the molecular plant pathology emphasis, is available at www.plpa.agri.umn.edu.

Language Requirements—A foreign language is generally not required. However, knowledge of a foreign language may be necessary for students doing research in non-English-speaking countries.

Minor Requirements for Students Majoring in Other Fields—A minimum of 12 credits in PlPa 5xxx or 6xxx is required for a doctoral minor.

Policy Issues on Work and Pay

Postbaccalaureate Certificate


For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters stepl.asp.

Professor

Stephen Befort, Law School, M
John Budd, Human Resources and Industrial Relations, M
Morris Kleiner, Public Affairs, M
James Griffin Scoville, Human Resources and Industrial Relations, M
Maria Hanratty, Public Affairs, M

Curriculum—This certificate provides an understanding of and the ability to evaluate federal, state, and local policies that affect the employment relationship. Students learn about the role of government in the employment relationship, including statutes and how employers, unions, and the government interpret policies. Core courses are drawn from the Humphrey Institute of Public Affairs as well as the Industrial Relations Center in the Carlson School of Management, with auxiliary courses in law, history, sociology, and applied economics.

Prerequisites for Admission—Students must have a bachelor’s degree from an accredited U.S. university or its foreign equivalent. Applicants should have mathematics coursework at least up through algebra and a course in microeconomics (Econ 1101 is offered via distance education at the University). A GPA of 3.00 is required and, for international students, a TOEFL score consistent with the Graduate School’s requirements. Students doing research in non-English-speaking countries.

Postbaccalaureate Certificate Requirements

The certificate consists of at least 15 credits: 5 credits in the core (required courses), and 10 credits of supporting electives. Courses are drawn primarily from the Humphrey Institute of Public Affairs and the Industrial Relations Center in the Carlson School of Management, with additional courses from the College of Liberal Arts and the Law School, and Applied Economics. Students complete 10 elective credits that allow them to focus on the area of public policy that is most relevant to their professional and educational goals and needs. Note that some elective courses require prerequisites which do not count toward the certificate.

Completion Requirements—Early in the program, each student should file a certificate program plan with the College of Continuing Education indicating the courses that will be taken, subject to change with faculty approval. Completion of the certificate program requires completion of the indicated courses with core courses requiring a grade of B or better and with an overall GPA in certificate coursework of 3.00 or higher.

Political Psychology

Minor Only

Contact Information—Doctoral Minor in Political Psychology, Center for the Study of Political Psychology, University of Minnesota, 1227 Social Sciences Building, 267 19th Avenue S., Minneapolis, MN 55455; (612-624-0864; fax 612-625-2078; cspp@polisci.umn.edu, www.polisci.umn.edu/polpsych/minor/index.html).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters stepl.asp.

Regents Professor

John L. Sullivan, Political Science, M
Patricia G. Avery, Curriculum and Instruction, M
Eugene Borgida, Psychology, M
Karlyn K. Campbell, Communication Studies, M
Ronald J. Faber, Journalism and Mass Communication, M
William H. Flanigan, Political Science, M
David W. Johnson, Educational Psychology, M
Paul E. Johnson, Information and Decision Sciences, M
Geoffrey Maruyama, Educational Psychology, M
R. Michael Paige, Educational Policy and Administration, M
W. Phillips Shively, Political Science, M
Mark Snyder, Psychology, M
Daniel B. Wackman, Journalism and Mass Communication, M

Associate Professor

Guy Charles, Law, M
James N. Druckman, Political Science, M
Martha H. Gonzales, Psychology, M
Wendy M. Rahn, Political Science, M
Alexander J. Rothman, Psychology, M

Use of 4xxx Courses—4xxx courses may not be used to meet certificate requirements.
psychological approaches to political decision making: public policy and international relations. Students are able to tailor the minor to complement their major programs. The required courses are Pol 8307, 8308 or Psy 8211, 8212—Proseminar in Political Psychology (2 cr); Pol 8311—Political Psychology and Socialization (3 cr); and Psy 8201—Social Cognition (3 cr). Contact the director of graduate studies for more details.

Political Science

Contact Information—Department of Political Science, University of Minnesota, 1414 Social Sciences Building, 267 19th Avenue S., Minneapolis, MN 55455 (612-624-4144; fax 612-626-7599; office@polisci.umn.edu).

For up-to-date graduate faculty listings, see www.polisci.umn.edu/faculty_rosters/step1.asp.

Regents Professor
John L. Sullivan, SM

Professor
Michael Barnett, SM
Mary G. Dietz, SM
Lisa J. Disch, SM
Raymond D. Duvall, SM
James Farr, SM
William H. Flanigan, SM
Edwin Fogelman, SM
John R. Freeman, SM
Lawrence R. Jacobs, SM
Robert B. Kvavik, SM
August H. Nimitz, Jr., SM
Steven J. Rosenstone, SM
William Scheuerman, SM
Thomas M. Scott, SM
W. Phillips Shively, SM
Kathryn A. Sikkink, SM
David E. Wilkins, ASM

Associate Professor
Jamie Druckman, M2
Daniel Kellihier, SM
Wendy M. Rahn, SM
Martin W. Sampson III, SM
David J. Samuels, SM

Assistant Professor
Scott Abernathy, M2
Elizabeth Beaumont, M2
Teri Caraway, M2
Kathleen Collins, M2
Songying Fang, M2
Christopher Frederico, M2
Elisabeth Hibini, M2
Timothy R. Johnson, M2
Colin H. Kahl, M2
Ronald Krebs, M2
Jeffrey D. Lomonaco, M2
Samantha C. Luks, M2
Joanne Miller, M2
Kathryn Pearson, M2
Jason Roberts, M2
Dara Strolovitch, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The curriculum is divided into five subfields: formal models and methodology, political theory, American politics, international relations, and comparative politics.

Prerequisites for Admission—The department’s graduate admissions committee selects the strongest applicants based upon consideration of all components of the application file. The committee accepts students who have or are completing B.A. or B.S. degrees and students who have or are completing M.A. degrees.

Special Application Requirements—All students, except those in the special master’s program, are admitted directly into the Ph.D. program. The following should be sent directly to the department: department application form; GRE scores; a complete set of transcripts in addition to that required by the Graduate School; a brief statement expressing the applicant’s purpose and goals in pursuing graduate work (in addition to and separate from the statement required as part of the Graduate School application form); three letters of recommendation from professors who know the applicant’s academic work, particularly in political science; and samples of the applicant’s written work (papers written for political science courses preferred). Send photocopies of written work; the department cannot guarantee that materials will be returned.

Graduate study in the Ph.D. program must begin in fall semester; the application deadline is January 1. Graduate study in the special M.A. program may begin in any semester; the application deadline for fall semester is May 1; spring semester is October 1.

The department and the Humphrey Institute of Public Affairs jointly offer a program that leads to an M.A. in public affairs and a Ph.D. in political science. To be eligible, students must be admitted separately by political science and public affairs. Normally, students begin their study in public affairs and later apply to the Ph.D. program in political science. However, students may begin in either program, so it is possible to apply initially to either program or both. Students interested in this joint degree program should contact the director of graduate studies.

Courses—Please refer to Political Science (Pol) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—4xxx and 5xxx courses from other departments usually are acceptable for supporting or minor programs with approval of the department that teaches the course. Political science courses at these levels are generally not open to Ph.D. students, who are expected to take 8xxx seminars. They are open to professional M.A. students.
M.A. Degree Requirements Plan B Only

This program is for secondary school teachers, journalists, government employees, political professionals, and others whose ongoing professional work requires them to get further training in political science and related disciplines without the depth and extensive research emphasized in the Ph.D. program. Students may choose among several subfields, including political theory, comparative politics, international relations, American politics, and formal models and methodology.

The M.A. degree, Plan B (without thesis), requires 34 credits, distributed between major courses and minor or related field courses; three research papers, usually written in connection with coursework, are also required.

Language Requirements—None.

Final Exam—The final exams are written and oral.

Ph.D. Degree Requirements

The program is divided into five subfields: American politics, comparative politics, political theory, international relations, and formal models and methodology. A joint M.A.-Ph.D. program is also available that leads to an M.A. in public affairs from the Hubert H. Humphrey Institute of Public Affairs and a Ph.D. in political science.

Students concentrate in two of the five subfields and take a minimum of 10 political science seminars, including Pol 8201 and the core seminars in each of their subfields (Pol 8201, 8301, 8401, 8601). In addition, they take three advanced seminars in their first subfield and three in their second, or four advanced seminars in their first subfield and two in their second subfield (formal models and methodology can be used only as a second subfield).

Language Requirements—Students must demonstrate one of the following: a) high proficiency in one foreign language, b) high proficiency in research methodology, c) low proficiency in two foreign languages, d) low proficiency in one foreign language and low proficiency in research methodology.

Students who concentrate in comparative politics must have appropriate language competence in their area(s) of specialization.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires a minimum of 9 credits of graduate-level courses and an exam.

Population Studies

Minor Only

Contact Information—Minnesota Population Center, University of Minnesota, 50 Willey Hall, 225 19th Avenue South, Minneapolis, MN 55455 (612-624-5818; fax 612-626-8375; topstudies@pop.umn.edu; www.pop.umn.edu/topstudies.html). For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor

John S. Adams, Geography, M
Ragui A. Assaad, Humphrey Institute of Public Affairs, M
John M. Eleyer, History of Medicine, M
Katherine Fennelly, Humphrey Institute of Public Affairs, M
M. Janice Hogan, Family Social Science, M
Robert E. McCaa, History, M
Phyllis E. Moen, Sociology, M
Jeylan T. Mortimer, Sociology, M
Samuel L. Myers, Jr., Humphrey Institute of Public Affairs, M
Steven Ruggles, History, M
Rudolph J. Vecoli, History, M

Associate Professor

Kathleen Thiede Call, Health Services Research and Policy, M
Jeffrey R. Crump, Design, Housing, and Apparel, M
Elizabeth E. Davis, Applied Economics, M
Paul W. Glewwe, Applied Economics, M
Wendy L. Hellerstedt, Epidemiology, M
Deborah Levison, Humphrey Institute of Public Affairs, M
Ian Ross Macmillan, Sociology, M
Joan M. Patterson, Epidemiology, M
John Robert Warren, Sociology, M

Assistant Professor

Michael E. Davern, State Health Access Data Assistance Center, M
Ann Meier, Sociology, M
J. Michael Oakes, Epidemiology, M

Research Associate

Miriam L. King, Minnesota Population Center, M

Curriculum—Population studies is a multidisciplinary research area at the intersection of the mathematical sciences, the health and social sciences, and public policy. The curriculum provides solid grounding in the theories and methods of demography, with additional specialized training in five interdisciplinary subject areas: historical demography, population geography, economic demography, public health demography, and family and life course demography.

Prerequisites for Admissions—Enrollment in the population studies minor program is contingent upon prior admission to a master’s or doctoral degree-granting program within the Graduate School. Students need not formally apply to enroll in the minor; any student currently in good standing in the Graduate School may elect to complete the minor by fulfilling the requirements and filing a program completion form with the director of graduate studies.

Special Application Requirements—None.

Courses—Please refer to the minor program Web site at www.pop.umn.edu/popstudies/ for information on coursework pertaining to the program.

Use of 4xxx Courses—4xxx courses may not be included on degree program forms for the population studies minor.

Language Requirement—None.

Minor Only Requirements

The minor in population studies is available to master’s and doctoral students. Both a master’s and doctoral minor require the core course, PA 5301—Population Methods and Issues for the United States and Third World. In addition to the core course, master’s students take at least nine credits and doctoral students take at least nine credits from the list of approved courses at www.pop.umn.edu/popstudies/courses.htm. All courses should be from the same subject area and may not be in the student’s major field. A total of six credits at the master’s level and twelve credits at the doctoral level is required for the minor. Students must register for all courses A-F; courses taken on a pass/fail basis may not count toward the minor (with the exception of PubH 5628, which is currently offered only S-N).

Portuguese

See Hispanic and Luso-Brazilian Literatures and Linguistics.

Program Evaluation

Minor Only

Contact Information—Director of Graduate Studies, Program Evaluation Program, University of Minnesota, 330 Wulling Hall, 86 Pleasant Street S.E., Minneapolis, MN 55455 (612-624-1006; fax 612-624-3377; popstudies@pop.umn.edu; eduw.edu/popstudies). For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor

Michael Baizerman, Social Work, Work, Community, and Family Education, Educational Policy and Administration, M
Nancy N. Eustis, Public Affairs, M
Judith Garrard, Health Services Research, Policy, and Administration, M
David J. Johnson, Institute on Community Integration, M
Jean A. King, Educational Policy and Administration, M
Richard A. Krueger, Work, Community, and Family Education, M
Frances P. Lawrenz, Curriculum and Instruction, M
Darrell R. Lewis, Educational Policy and Administration, M
Patricia S. Seppanen, AM

Curriculum—A minor in program evaluation may be pursued at both the doctoral and the master's levels. The core of the curriculum
consists of courses in the foundations of evaluation, evaluation theory, and internship experiences.

**Prerequisites for Admission**—Prior admission into an established M.A. or Ph.D. is required. Admission to the minor, therefore, will be contingent upon enrollment in good standing within a recognized degree-granting program of the Graduate School.

**Special Application Requirements**—Students apply for admission through the director of graduate studies and faculty. Students must demonstrate relevant academic background, including research methodology, and experience in a field in which program evaluation is practiced (e.g., public health, social work, and education). Students from existing evaluation programs in EdPA and EPsy are not eligible for the minor.

**Courses**—Please refer to Educational Policy and Administration (EdPA), Educational Psychology (EPsy), Family Social Science (FSSoB), Public Health (PubH), and Work, Community, and Family Education (WCFE) in the course section of this catalog for courses pertaining to the program.

**Use of 4xxx Courses**—Use of 4xxx courses is not permitted.

**Minor Only Requirements**
Students need a minimum of 15 credits for the doctoral minor and a minimum of 9 credits for the master’s minor. Individual programs are designed through consultation among the student, the major adviser, and the director of graduate studies.

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### Psychosocial Foundations of Education

See Educational Psychology.

### Psychology

**Contact Information**—Department of Psychology, University of Minnesota, 249 Elliott Hall, 75 East River Road, Minneapolis, MN 55455 (612-624-4181; fax 612-626-2079; psyapply@umn.edu; www.psych.umn.edu). For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

**Regents Professor**
Ellen S. Berscheid, SM

**Professor**
Richard D. Arvey, Human Resources and Industrial Relations, ASM
Eugene Borgida, SM
Thomas J. Bouchard, Jr., SM
Dwight A. Borkhardt, SM
James N. Butcher, ASM
John P. Campbell, SM
Marilyn E. Carroll, Psychiatry, ASM
Sandra L. Christenson, ASM
Mark L. Davison, Educational Psychology, ASM
René V. Dawis, ASM
Byron Egeland, Child Development, ASM
Patricia A. Frazier, SM
Megan R. Gunnar, ASM
Jo-Ida C. Hansen, SM
Dorothy K. Hatsuikami, Psychiatry, ASM
William G. Iacono, SM
Paul E. Johnson, Information and Decision Sciences, ASM
Daniel J. Kersten, SM
Thomas J. Kiresuk, Psychiatry, AM2
Eric Klinger, Social Sciences, Morris, ASM
Gordon E. Legge, SM
Glória R. Leon, SM
Allen S. Levine, Psychiatry, ASM
Rodney G. Loper, University Counseling and Consulting Services, ASM
Ann S. Masten, Child Development, ASM
Matthew K. McCue, SM
Stephan J. Motowidlo, SM
J. Bruce Overmier, SM
Christopher J. Patrick, SM
Herbert L. Pick, Jr., Child Development, ASM
Paul R. Sackett, SM
Jeffry A. Simpson, SM
Mark Snyder, SM
Sheldon B. Sparer, Pharmacology, ASM
L. Alan Sroufe, Child Development, ASM
Thomas Stoffregen, Kinesiology, ASM
Paul van den Broek, Educational Psychology, ASM
Neal F. Viemeister, SM
Connie R. Wanberg, Human Resources and Industrial Relations, ASM
Richard A. Weinberg, Child Development, ASM
David J. Weiss, SM
James E. Ysseldyke, Educational Psychology, ASM

**Associate Professor**
James P. Clicary, AM2
Charles R. Fletcher, SM
Theresa M. Glomb, Human Resources and Industrial Relations, AM2
Martha H. Gonzales, SM
William M. Grove, SM
Sheng He, SM
Darwin D. Hendel, Educational Policy and Administration, AM2
Robert F. Kraeger, SM
Matt G. Kushner, Psychiatry, ASM
Richard M. Lee, SM
Monica Luciana, SM
Chad J. Marsolek, SM
Michael H. Miner, Family Medicine and Community Health, AM2
Deniz S. Ones, SM
Carol H. Pazzanak, AM2
Gail Burton Peterson, SM
William N. Robiner, AM
Alexander J. Rothman, SM

**Professor**
Joyce E. Bono, SM
Kathy J. Christensen, Neurology, AM2
Christopher M. Federico, SM
Celia W. Gershenson, AM2
Jonathan C. Gewirtz, SM
John C. Gonsiorek, AM2
Harriet L. C. Haynes, University Counseling and Consulting Services, AM
Wilma Koutstaal, MA
Angus MacDonald, M2
Patricia J. Pardo, Psychiatry, AM2

Carol B. Peterson, AM
David N. Rapp, Educational Psychology, AM2
Paul R. Schrater, M2
Scott R. Spenheim, AM2
Mark J. Thomas, M2
Linda K. Van Egeren, AM2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

**Curriculum**—Except for the psychometric/quantitative methods specialization and in special circumstances, students are admitted only for the Ph.D. However, a number of Ph.D. subareas require a Plan A master’s to ensure that research training starts early. Doctoral program specialties are offered in biological psychopathology, clinical science and psychopathology research, cognitive and biological psychology, counseling psychology, differential psychology/behavior genetics, industrial/organizational psychology, personality research, psychometric/quantitative methods, school psychology, and social psychology.

**Prerequisites for Admission**—Prospective students generally have completed 12 credits (three to four courses) of psychology work beyond introductory psychology, including one course in statistics or psychological measurement. For the clinical science program, a course in abnormal psychology is required. An undergraduate major in psychology is desirable, but not necessary.

**Special Application Requirements**—Applications are accepted for fall admission only; the deadline is December 30. A department application, a statement of career interests, goals, and objectives, three letters of recommendation from persons familiar with the applicant’s scholarship and research potential, and scores from the General Test of the GRE should accompany applications. The GRE Subject Test in psychology is recommended. Although there are no specific required minimums for GPAs and GRE scores, the range of scores for those admitted in previous years, as well as other specific requirements, are available from the psychology Web site at www.psych.umn.edu.

To ensure full consideration for fellowships and teaching and research assistantships, submit the Graduate School application, transcripts, and application fee to the Graduate School by December 1.

**Courses**—Please refer to Psychology (Psy) in the course section of this catalog for courses pertaining to the program.

**Use of 4xxx Courses**—Certain 4xxx courses may be taken for graduate credit. Students should consult the instructor or director of graduate studies.

### M.A. Degree Requirements
Degree Programs and Faculty

Each student’s program is planned in consultation with an adviser. Plan A requires a minimum of 14 credits in psychology and 6 credits in a minor-related field, a minimum of 10 thesis credits, and a research thesis. Plan B requires one to three review papers in lieu of a thesis, and a minimum of 30 course credits, of which 14 credits must be in psychology and 6 credits in one or more related fields. For Plan A, the final exam is oral; for Plan B, it may be written, oral, or both.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—A master’s minor requires a minimum of 6 credits, with specific courses determined in consultation with an adviser and other faculty.

Ph.D. Degree Requirements

Students must satisfy the general area distribution requirement using selected courses in four areas outside their specialization. There are no other general departmental course requirements. Each student’s program is individually planned in consultation with an adviser to meet both the individual’s goals and the area requirements. The programs in clinical psychology and counseling psychology include specific requirements for applied coursework and practicum and internship experience. Each specialization also requires completion of a series of Ph.D. seminars covering scholarship and research skills. Students also complete 12-15 credits in a minor or supporting program.

Language Requirement—None.

Minor Requirements for Students Majoring in Other Fields—The doctoral minor requires a minimum of 12 credits and is designed according to student needs.

Public Affairs

Contact Information—Director of Admissions, Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, 301 19th Avenue South, Minneapolis, MN 55455, (612) 624-3800; fax 612-626-0002; admissions@hhh.umn.edu; www.hhh.umn.edu.

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Regents Professor

G. Edward Schub, M2

Professor

Dean E. Abrahamson (emeritus), AM2
John S. Adams, M2
Raguí A. Assaad, M2
J. Brian Atwood, M2
Michael Barnett, M2
Richard Bolan (emeritus), AM2
John E. Brandl, M2
John M. Bryson, M2
Nancy N. Eustis, M2
Katherine Fennelly, M2
Edward G. Goetz, M2
Stephen A. Hoenan, M2
Kenneth H. Keller, M2
Sally J. Kenney, M2
Morris M. Kleiner, M2
Robert T. Kudlue, M2
Ann R. Markussen, M2
Samuel L. Myers, M2

Associate Professor

Barbara Crosby, M2
Maria J. Hanratty, M2
Deborah Levison, M2
Joseph A. Ritter, M2
Jodi R. Sandfort, M2
Melissa M. Stone, M2

Assistant Professor

Kevin J. Krizek, M2
Aijun Nie, M2
Carissa Schively, M2

Other

Zbigniew M. Bochmierz, M2
Harry C. Boyte, M2
Jacqueline Copeland-Carson, AM2
Gary M. DeCramer, M2
Marsha A. Freeman, M2
P. Jay Kiedrowski, AM
Jennifer Kuzma, AM2
Barbara L. Lukermann, AM
Lee Munnich, AM
Joseph H. Nathan, AM
Timothy Penny, AM
Sharon Sayles Belton, AM
Paul C. Stone, AM

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The master of public affairs (M.P.A.) is intended for mid-career professionals. It is a broad, generalist program that emphasizes leadership and policy making. Completion of degree requirements is possible within a calendar year (two semesters and a summer) of full-time enrollment, or two to three years of part-time enrollment. Structured concentrations include advanced policy analysis methods; economic and community development; foreign policy and international affairs; public and nonprofit leadership and management; science, technology and environmental policy; social policy; women and public policy; land use/urban design planning; regional, economic and workforce development; housing and community development; environmental planning; and transportation planning.

Prerequisites for Admission—Ten years or more of career or public affairs experience, basic competency in computers, and a U.S. bachelor’s degree or foreign equivalent is required.

Special Application Requirements—In addition to the materials submitted to the Graduate School, applicants must submit to the Humphrey Institute a photocopy of the Graduate School admission application, a Humphrey Institute Applicant Data form, copies of all transcripts, a statement of purpose, at least three letters of recommendation, and a professional résumé. The deadline for applications is April 1 of the preceding academic year. Entry is for fall and spring semesters.

Courses—Please refer to Public Affairs (PA) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx Courses on degree program forms is permitted with instructor’s and adviser’s permission.

M.P.A. Degree Requirements

The M.P.A. requires 30 credits, including PA 5941—Leadership for the Common Good (4 cr), PA 8001—Transforming Public Policy (4 cr), and PA 8002—Synthesis Workshop or an equivalent capstone workshop (4 cr); 9 credits in concentration courses; 6 credits in skills courses; and 3 credits of electives.

Language Requirements—None.

Public Health

Minor Only

Contact Information—Student Services Center, School of Public Health, University of Minnesota, MMC 819, 420 Delaware Street S.E., Minneapolis, MN 55455 (612-626-3500 or 1-800-774-8636; fax 612-624-4498; sps.ssc@umn.edu; www.sph.umn.edu)

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor

Michael Baizerman, Social Work, M
Jeff Blaine Bender, M
Judith M. Garrard, M
Ann W. Garwick, Nursing, M
Susan G. Gerberich, M
Robert W. Jeffery, M
Barbara J. Leonard, Nursing, M
A. Marshall McBean, M
Michael D. Resnick, Pediatrics, M
Robert L. Veninga, M

Associate Professor

Leslie A. Grant, M
Wendy L. Helferstedt, M
Patricia M. McGovern, M
Joan M. Patterson, M

Curriculum—The public health minor is available to master’s (M.A. and M.S.) and doctoral students.

Prerequisites for Admission—Admission is contingent upon prior admission to a master’s or doctoral degree-granting program within the Graduate School. Students enrolled in graduate programs within the School of Public Health are not eligible for this minor.

Special Application Requirements—Students declaring a minor in public health should contact the director of graduate studies in public health as early as possible. Enrollment is contingent upon approval of the application by the director of graduate studies, after which a minor program adviser(s) is assigned.
Courses—Please refer to Public Health (PubH) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx Courses is not permitted.

Minor Only Requirements

The master’s minor requires a minimum of 8 graduate credits; the doctoral minor requires a minimum of 14 graduate credits. Courses for the minor must be selected from those offered by the School of Public Health. In order to meet the minor requirements, students must successfully complete graduate coursework in each of the following disciplines: biostatistics, epidemiology, and environmental health. Suggested courses include PubH 6101—Environmental Health or PubH 6102 Issues in Environmental Health; PubH 6320—Fundamentals of Epidemiology or PubH 6330 Epidemiology I; and PubH 6414—Biostatistical Methods I.

If students have already taken comparable graduate-level courses in these disciplines, other public health courses can be used to complete the minor requirement with the approval of the public health adviser and the director of graduate studies. Since public health courses may have prerequisites or enrollment limitations, early planning with an adviser is suggested.

Language Requirements—None.

Public Policy

Contact Information—Director of Admissions, Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, 301 19th Avenue South, Minneapolis, MN 55455 (612-624-3800; fax 612-625-3813; admissions@hhih.umn.edu; www.hhih.umn.edu). For up-to-date graduate faculty listings, see www.grad.umn.edu/graduate_faculty/index.html.

Regents Professor

G. Edward Schult, M2

Professor

Dean E. Abrahamson (emeritus), AM2
John S. Adams, M2
Ragu A. Assaad, M2
J. Brian Atwood, M2
Michael Barnett, M2
Richard S. Bolan (emeritus), AM2
John E. Brandt, M2
John M. Bryson, M2
Nancy N. Eustis, M2
Katherine Fennelly, M2
Edward G. Goetz, M2
Stephen A. Hoenack, M2
C. David Hollister, AM
Kenneth H. Keller, M2
Sally J. Kenney, M2
Morris M. Kleiner, M2
Robert T. Kudrle, M2
Ann R. Markusen, M2
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Jodi R. Sandfort, M2
Melissa Stone, M2

Assistant Professor

Kevin J. Krizek, M2
Aijun Nie, M2
Carissa Schively, M2

Other

Zbigniew M. Bochniarz, M2
Harry C. Boyte, M2
Jacqueline Copeland-Carson, AM2
Gary DeCramer, M2
Marsha A. Freeman, M2
P. Jay Kiedrowski, AM
Jennifer Kuzma, AM2
Barbara L. Lukermann, AM
Lee W. Munnich, M2
Joseph H. Nathan, M2
Timothy Penny, AM
Sharon Sayles Belton, AM
Paul C. Stone, AM

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The master of public policy (M.P.P.) curriculum is built upon a core of required theoretical and methodological courses. In remaining courses, students choose either to emphasize more advanced study of analysis or management, or to focus on a particular substantive area of public policy. Structured concentrations include advanced policy analysis methods, economic and community development, foreign policy and international affairs, public and nonprofit leadership and management, science, technology and environmental policy, social policy, and women and public policy. Students have multiple opportunities to apply the concepts learned in their coursework to real-life policy problems, including cases presented in courses, their internships, and workshops. Dual degrees include M.P.P./juris doctor; M.P.P./master of science in health services research, policy, and administration; M.P.P./master of social work.

Prerequisites for Admission—Students are expected to have completed the equivalent of an introductory course in microeconomics, have basic competency in college algebra and computers, and have a U.S. bachelor’s degree or foreign equivalent.

Special Application Requirements—In addition to the materials submitted to the Graduate School, applicants must submit to the Humphrey Institute a photocopy of the Graduate School application, the Humphrey Institute Applicant Data Form, copies of all academic transcripts, a statement of purpose, at least three letters of recommendation, a GRE official score report, and a professional resume or C.V. Students who wish to be considered for financial aid should apply no later than January 5 of the preceding academic year. Entry is for fall semester.

Courses—Please refer to Public Affairs (PA) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx Courses towards degree requirements is permitted with instructor’s and adviser’s permission.

M.P.P. Degree Requirements

The M.P.P. requires 45 credits—approximately 20 credits in required core courses, a three-course concentration (9 credits minimum), and a 3-credit course to complete the professional paper. Remaining credits are taken in elective courses. A non-credit internship is also required, unless the student is exempted based on previous relevant employment. Students may pursue a minor.

Language Requirements—None.

Final Exam—Final oral presentation is required.

Minor Requirements for Students Majoring in Other Fields—A minor is constructed in consultation with the student’s minor adviser.

Quaternary Paleoecology

Minor Only

Contact Information—Emi Ito, Director of Graduate Studies, Quaternary Paleoecology Graduate Program, University of Minnesota, 108 Pillsbury Hall, 310 Pillsbury Drive S.E., Minneapolis, MN 55455 (612-624-7881; fax 612-625-3819; emi.ito@umn.edu). For up-to-date graduate faculty listings, see www.grad.umn.edu/graduate_faculty/index.html.

Regents Professor

Herbert E. Wright, Jr. (emeritus), Geology and Geophysics, AM

Professor

Subir K. Banerjee, Geology and Geophysics, M
Dwight A. Brown, Geography, M
Edward J. Cushing, Ecology, Evolution, and Behavior, M
R. Lawrence Edwards, Geology and Geophysics, M
Guy E. Gibson, Anthropology, M
Emi Ito, Geology and Geophysics, M
Thomas C. Johnson, Large Lakes Observatory, Duluth, M
Edward A. Nater, Soil, Water, and Climate, M
Richard H. Skaggs, Geography, M
Peter S. Wells, Anthropology, M

Associate Professor

James Cotner, Ecology, Evolution, and Behavior, M
Katherine Klink, Geography, M
Martha Tappen, Anthropology, M

Assistant Professor

David L. Fox, Geology and Geophysics, M
Greg Laden, Anthropology, M
Bryan N. Shuman, Geography, M
Shinya Sugita, Ecology, Evolution, and Behavior, M
Susy S. Ziegler, Geography, M
Curriculum—The faculty of the graduate minor in Quaternary Paleocoeology hold appointments in several departments. Students in this unique program benefit from the broad range of expertise and experience available at a large research university. From their coursework in the minor, graduate students learn techniques and approaches from other areas that can be applied to their own research. The minor is available to master’s (M.A. and M.S.) and doctoral students.

Prerequisites for Admission—Admission is contingent on prior admission to a Graduate School degree-granting program.

Special Application Requirements—Students apply by sending a letter of application to the director of graduate studies at qpminor@umn.edu as well as a letter of recommendation from their current adviser. Application may be made at any time.

Courses—See http://lrc.geo.umn.edu/QPCourses.pdf and contact the director of graduate studies at qpminor@umn.edu for information on relevant coursework.

Use of 4xxx Courses—Any 4xxx course included in the published list at http://lrc.geo.umn.edu/QPCourses.pdf may be used to satisfy the minor requirement.

Minor Only Requirements
Students develop their curricula in consultation with their major advisers and the director of graduate studies in Quaternary paleoecology. Students choose courses from two lists found at http://lrc.geo.umn.edu/QPCourses.pdf. Master’s students must take one of the three courses from List A plus one or more courses from List B for a total of 6 credits. Ph.D. students take two of the three courses from List A plus one additional course from List B for a total of 9 credits. Some requirements may be waived depending upon the student’s background.

In all cases, the selected courses must be outside the student’s major field for List A and 6 credits. Ph.D. students take one of the three courses from List A plus one additional course from List B for a total of 9 credits. Some requirements may be waived depending on the student’s background.

In all cases, the selected courses must be outside the student’s major field for List A and outside the cluster that includes the student’s major field in List B.

Recreation, Park, and Leisure Studies

Contact Information—Marta Fahrenz, Coordinator of Graduate Studies, School of Kinesiology, University of Minnesota, 223B Cooke Hall, 1900 University Avenue S.E., Minneapolis, MN 55455; 612-624-5300; fax 612-626-7700; pam@umn.edu; http://education.umn.edu/kit.

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.as.ustx;

Professor
Dorothy H. Anderson, Forest Resources, AM2
William C. Gartner, Applied Economics, AM2
Mary Jo Kan, M2
Leo H. McAvoy, Jr., M2
John E. Rynders, Educational Psychology, AM2
Michael G. Wade, M2

Associate Professor
Carla E. S. Tabourne, M2
Diane M. Wiese-Bjornstal, M2

Assistant Professor
Kenneth Bartlett, Work, Community, and Family Education, AM2
W. Corliss Outley, M2

Instructor
JoAnn Baysse, M2
Stephan P. Carlson, Forest Resources, AM2
Robert Danforth, AM2
Maurice K. Fahnstock, AM2

Research Associate
Carol A. Leitschuh, M2
Ingrid E. Schneider, Forest Resources, AM2

Senior Research Associate
David W. Lime (emeritus), Forest Resources, AM2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—Emphasis areas in the master’s program are park and recreation administration, outdoor education/recognition, sport management, and therapeutic recreation.

Prerequisites for Admission—Although prospective students generally have an undergraduate degree in recreation, park, and leisure studies, others with a baccalaureate degree including related preparation and a significant background and interest in the scientific study of recreation, park, and leisure studies may be admitted. Admitted students may be required to complete background preparation in undergraduate and graduate recreation, park, and leisure studies and related coursework.

Special Application Requirements—Applicants must submit a completed University of Minnesota-Twin Cities Graduate School application form; a Division of Recreation and Sport Studies application form, including a clearly written statement of academic interests, goals, and objectives; scores from the General Test of the GRE (verbal and quantitative) or the Miller Analogies Test that are less than five years old; three letters of recommendation from persons familiar with their scholarship and research potential; a scholarly paper; and copies of official transcripts. Students may apply at any time; however, submission of all application materials by December 15 is strongly encouraged to ensure priority consideration as well as teaching and research assistantships awarded for the next academic year. The three letters of recommendation must be sent directly to the department. Students can be admitted any term.

Research Facilities—Research facilities include the Institute on Community Integration, Wilderness Inquiry, and the Tucker Center for Research on Girls and Women in Sport.

Courses—Please refer to Recreation, Park, and Leisure Studies (Rec) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Inclusion of 4xxx courses on degree program forms is subject to adviser and director of graduate studies approval.

M.A. Degree Requirements
Students select an emphasis in park and recreation administration, outdoor education/recreation, sport management, or therapeutic recreation.

The M.A. is offered under Plan A and Plan B. Plan A requires 30 credits, including at least 14 credits in recreation, park, and leisure studies, 6 credits in a minor or related field, and 10 thesis credits (Rec 8777). Plan B also requires 30 credits, including at least 14 credits in recreation, park, and leisure studies, 6 credits in a minor or related field, and 4 credits of a research project (Rec 8995). A 3.00 minimum GPA is required to maintain good standing and to graduate.

Language Requirements—None.

Final Exam—The final exam is oral.

Rehabilitation Science

Contact Information—Program in Rehabilitation Science, MMC 388, 420 Delaware St. S.E., Minneapolis, MN 55455; 612-625-3966; fax 612-625-7912; adamc002@umn.edu; www.rehabscience.umn.edu.

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.as.

Professor
James Carey, SM
Richard Di Fabio, SM
Carl Kulkula, SM
Robert Patterson, SM

Associate Professor
Dennis Dykstra, SM
Virgil Mathiowetz, SM
Erica Stern, SM
LaDora Thompson, SM

Assistant Professor
Teresa Jacobson Kinberley, SM
Dawn Lowe, SM
Paula Ludewig, SM

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The graduate program in rehabilitation science is a post-professional program designed to train researchers and academicians. The rehabilitation science M.S. and Ph.D. degrees are geared to occupational and physical therapists and students with related interests. The program’s philosophy
Degree Programs and Faculty

Ph.D. Degree Requirements

The Ph.D. requires a minimum of 36 course credits: 16 credits in core courses, including 6 credits of rehabilitation science seminar RSC 8100; 12 credits in a minor or supporting program; 8 credits in statistics (credits earned in core courses and statistics cannot be applied to the minor or supporting program); and 24 thesis credits. Students must maintain a 3.00 minimum GPA for all coursework taken in the program. In addition to these minimum requirements, the adviser may require additional courses. The Graduate School requires ethics in research training. Students should work with an adviser to identify a plan to meet this requirement. For additional information, visit www.research.umn.edu/ethics or contact the program.

Language Requirements—None.

Religions in Antiquity

See Classical and Near Eastern Studies.

Religious Studies

Minor Only

Contact Information—Director of Graduate Studies, Department of Classical and Near Eastern Studies, University of Minnesota, 305 Folwell Hall, 9 Pleasant Street S.E., Minneapolis, MN 55455 (612-625-5353).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp

Professor

Frederick M. Asher, Art History, M
Bernard S. Bachrach, History, M
Caesar E. Farah, African American and African Studies, M
Jasper S. Hopkins, Philosophy, M
Riv-Ellen Prell, American Studies, M
Theofanis G. Stavrou, History, M
James D. Tracy, History, M

Associate Professor

William W. Malandra (emeritus), ASM
Philip H. Sellar, M

Curriculum—The minor in religious studies is available to master’s (M.A. and M.S.) and doctoral students in relevant fields such as history, classics, English, anthropology, philosophy, and American studies, and is under the general direction of members of the graduate faculty who represent a broad spectrum of disciplines.

Prerequisites for Admission—Admission is contingent on prior admission to a master’s or doctoral degree-granting program within the Graduate School.

Special Application Requirements—Students should consult with the director of graduate studies for the program as early as possible, and in any case no later than their third semester of study. The director of graduate studies must approve the applicant’s proposed course of study and sign the student’s degree program form.

Use of 4xxx Courses—Inclusion of 4xxx courses on degree program forms is subject to approval by the director of graduate studies.

Minor Only Requirements

The minor requires 9 credits for an M.A. and 12 credits for the Ph.D. All minors will have at least one of the religious studies graduate faculty as members of their examination committees. All students enrolled in the minor take RelA 5521—Theory and Method in Religious Studies, and choose two (M.A.) or three (Ph.D.) from the following courses to complete the program: Afro 5036, AmSt 5101, ANE 5501/2, 5503/4, Anth 5059, Arab 5542, ArHR 5795, CNES 5088/9, 5252, JwSt 5013, 5960, 5111, Phil 8081, 8550, RelA 5071, 5072, 5073, 5080, 8190, SALC 5412/3.

Language Requirements—There are no special language requirements beyond those of the student’s major program.

Rhetoric and Scientific and Technical Communication

Contact Information—Department of Rhetoric, University of Minnesota, 64 Classroom Office Building, 1994 Buford Avenue, St. Paul, MN 55108 (612-624-4761; fax 612-624-3617; rhetorical@umn.edu; www.rhetoric.umn.edu).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp

Rhetoric and Scientific and Technical Communication Graduate Faculty

Professor

Carol Ann Berkenkotter, SM
Karlyn K. Campbell, Communication Studies, ASM
Terence G. Collins, General College, AM
Ann Hill Duin, SM
Shirley N. Garner, English, ASM
Michael F. Graves, Curriculum and Instruction, ASM
Alan G. Gross, Rhetoric, SM
Laura J. Gurak, Rhetoric, SM
Helen E. Longino, Women’s Studies, AM
Earl E. McDowell, Rhetoric, SM
Victoria M. Mikelonis, Rhetoric, SM
Donald J. Ross, Jr., English, AM
Edward A. Schiappa, Communication Studies, ASM
Mary M. Lay Schuster, Rhetoric, SM
Robert L. Scott (emeritus), Communication Studies, ASM
Richard A. Swanson, Work, Community, and Family Education, ASM
Elaine E. Tarone, ASM
Billie J. Wahlstrom, Rhetoric, SM
Arthur E. Walzer, Rhetoric, SM

Associate Professor

Lisa Albrecht, General College, AM
Lee-Ann Kastman Breuch, SM
Robert L. Brown, Jr., Cultural Studies and Comparative Literature, ASM

M.S. Degree Requirements

Plan A (thesis) requires a minimum of 33 credits: a minimum of 14 credits in the major, including 4 credits of rehabilitation science seminar (RSC 8100) and a research design course in rehabilitation science; a minimum of 6 credits in a minor or related field; 3 credits in statistics (EPsy 5261 or equivalent); and a minimum of 10 thesis credits (RSc 8777). In place of the 10 thesis credits for Plan A, Plan B (without thesis) requires courses chosen in consultation with an adviser and a Plan B project. Students must maintain a 3.00 minimum GPA for all coursework taken in the program. The Graduate School requires ethics in research training. Students should work with an adviser to identify a plan to meet this requirement. For additional information, visit www.research.umn.edu/ethics or contact the program.

Language Requirements—None.

Final Exam—For Plan A, the final exam is oral; for Plan B, it may be written, oral, or both.
Degree Programs and Faculty

Simon Hooper, Curriculum and Instruction, AM
Daniel J. Philpon, SM
Thomas M. Scanlan, Rhetoric, M2

Assistant Professor
Janel Anderson, M2
Richard J. Graff, M2
John Logie, M2
Bernadette C. Longo, M2

Scientific and Technical Communication
Graduate Faculty

Professor
Carol Ann Berkenkotter, M2
Ann Hill Duin, M2
Alan G. Gross, Rhetoric, M2
Laura J. Gurak, Rhetoric, M2
Earl E. McDowell, Rhetoric, M2
Victoria M. Mikelonis, Rhetoric, M2
Mary M. Lay Schuster, Rhetoric, M2
Billie J. Wahlstrom, Rhetoric, M2
Arthur E. Walzer, Rhetoric, M2

Associate Professor
Lee-Ann Kastman Breuch, M2
Bernadette C. Longo, M2
Daniel J. Philpon, M2
Thomas M. Scanlan, Rhetoric, M2

Assistant Professor
Janel Anderson, M2
Richard J. Graff, M2
John Logie, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The M.S. in Scientific and Technical Communication is a professional degree that focuses on research and skills applicable to the practice of scientific and technical communications in the workplace. It is designed for those students planning to be technical communicators or information developers in business and industry. For more information on this degree please see www.rhetoric.umn.edu/msstc.html.

The M.A. and Ph.D. in rhetoric and scientific and technical communication prepare students to address complex issues in language, science, and technology. The programs are flexible enough to allow students to approach their studies from a variety of perspectives and research methods. These programs prepare students for teaching at a university and conducting research in rhetoric and scientific and technical communication. The programs can also prepare students for specialist positions in industry and government that require the analysis and design of human communication systems. Required courses include theory and research, and practice in rhetoric and scientific and technical communication, analysis of scientific or technical discourse, and course work in a minor or related field.

All M.S., M.A., and Ph.D. applicants must meet the admission requirements of the Graduate School. M.A. and Ph.D. applicants should have a strong interest in language and rhetorical theory or communication theory. A background in a science, Internet studies, environmental studies, or pedagogy and technology is helpful. M.S. students are expected to have completed coursework or have equivalent experience in advanced communication (e.g., writing/editing, oral communication, visual communication, organizational communication, or communication theory) and one of the following areas: computer science, management information systems, science, technology, mathematics, engineering, or other related fields.

Special Application Requirements—Scores from the General Test of the GRE that are less than five years old are required of students with baccalaureate degrees from U.S. institutions. International students are encouraged to take the General Test of the GRE and to have those results forwarded to the Graduate School. Nonnative speakers of English are required to take the TOEFL with satisfactory scores. All applicants must submit three letters of recommendation, two writing samples, and a professional objective statement. M.S. deadlines are June 15 for fall semester admission and October 15 for spring semester admission. All M.A. and Ph.D. applicants begin in the fall semester and have a January 15 deadline.

Courses—Please refer to Rhetoric (Rhet) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Inclusion of 4xxx courses in degree program forms is subject to approval by the adviser and the director of graduate studies.

M.S. and M.A. Degree Requirements

The M.S. in scientific and technical communication requirements for Plan A and Plan B are the same except that Plan A requires a thesis (10 credits) and 24 course credits and Plan B requires 30 course credits and 5 project credits. Students take six courses in theory and research, and practice in technical communication. An internship is required for any student who has not yet worked as a technical communicator in industry. Students take additional electives in rhetoric to complete 34 credits for Plan A or 35 credits for Plan B.

The M.A. requirements for Plan A and Plan B are the same except that Plan A requires a thesis (10 credits) and Plan B requires a project (5 credits). Students take six courses (18 credits) in theory, research, and practice in rhetoric and scientific and technical communication in a minor or related field and electives to equal 30 credits of course work. Minor or related fields and electives to equal 30 credits of course work may focus on areas such as communication studies, English, curriculum and instruction, women's studies, cognitive psychology, and history of science.

Language Requirements—None for M.S. students. M.A. students must demonstrate proficiency in a foreign language of their choice either by taking 3 credits of a beginning level language course or having their adviser and the director of graduate studies certify that they have reading comprehension in a particular language.

Students can fulfill this requirement by taking a beginning 3 credit course or by completing a non-credit course such as Fren 0001—Reading French in the Arts and Sciences or Ger 222—Beginning German. These courses are offered through the College of Continuing Education, usually in the summer.

Final Exam—For both Plans A and B, students must pass an oral examination in which they defend their master's work and demonstrate competence in their chosen field of study.

Ph.D. Degree Requirements

Ph.D. students in rhetoric and scientific and technical communication are required to earn a minimum of 42 credits. This plan requires a minimum of 21 credits in rhetoric seminars and courses—two of those seminars must be in rhetorical theory and criticism within rhetoric course offerings. Students take two courses (6 credits) in rhetorical theory and criticism; two courses in technical communication research and theory (6 credits), including Rhet 8011 and 8012; two or more courses (6-12 credits) in a particular area of study such as rhetoric of science and technology; feminist theory in science, technology, and communication; scientific and technical communication pedagogy; or technology and culture; 0-6 credits in research methods courses; and 12 credits in a minor or related field. Minor or supporting programs may focus on areas such as communication studies, English, curriculum and instruction, women's studies, cognitive psychology, or history of science. In addition, 6 elective credits are needed to fulfill the minimum credit requirement. Students may fulfill 18 credits of Ph.D. work in completing M.A. requirements (usually two courses in rhetorical theory and three courses in other core areas). Twenty-four thesis credits are also required. The preliminary exams are both written (based on coursework and reading lists) and oral (based on the written preliminary exam). The final exam is oral.

Language Requirements—Ph.D. students must demonstrate proficiency in a foreign language of their choice either by taking 3 credits of a language course or having their adviser and the director of graduate studies certify that they have reading comprehension in a particular language. A student could also fulfill this requirement by taking a beginning 3 credit course or by completing a non-credit course such as Fren 0001—Reading French in the Arts and Sciences or Ger 222—Reading German. These courses are offered through the College of Continuing Education, usually in the summer.
Minor Requirements for Students Majoring in Other Fields—For M.A. and M.S. students, the minor requires 6 credits in 5xxx and 8xxx rhetoric courses. The minor for Ph.D. students requires 12 credits of 5xxx and 8xxx courses (6 of which can be taken for the M.A. or M.S. degree) with one course being in rhetorical theory and criticism. Students may choose the remaining courses from any of rhetoric’s graduate courses.

Scandinavian Studies
See Germanic Studies.

School Psychology
See Educational Psychology.

Science, Technology, and Environmental Policy

Contact Information—Director of Admission, Hubert Humphrey Institute of Public Affairs, University of Minnesota, 301 19th Avenue South, Minneapolis, MN 55455 (612-624-3800; fax 612-625-3513; admissions@hhh.umn.edu; www.hhh.umn.edu). For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Regents Professor
G. Edward Schuh, M2

Professor
Dean E. Abrahamson (emeritus), AM2
John S. Adams, M2
Ragui A. Assaad, M2
J. Brian Atwood, M2
Michael Barnett, M2
Richard Bolan (emeritus), AM2
John E. Brandl, M2
John M. Bryson, M2
K. William Easter, AM2
Nancy N. Eustis, M2
Katherine Fennelly, M2
Edward G. Goetz, M2
Stephen A. Hoenack, M2
Anne Kapucinski, AM
Kenneth H. Keller, M2
Sally J. Kenney, AM2
Morris M. Kleiner, M2
Robert T. Kudrle, M2
Ann R. Markusen, M2
Joseph L. Myers, M2
Philip Pardey, AM2

Associate Professor
Barbara Crosby, M2
Maria J. Hanratty, M2
Deborah Levison, M2
Joseph A. Ritter, M2
Jodi R. Sandfort, M2
Melissa M. Stone, M2

Assistant Professor
Kevin J. Krizek, M2
Aijnie Nie, M2
Carissa Schively, M2

Other
Zbigniew M. Bochnianz, M2
Harry C. Boyle, M2
Jacqueline Cooper-Carson, AM2
Gary DeCramer, M2
Marsha A. Freeman, M2
P. Jay Kiedrowski, AM
Jennifer Kuzma, AM2
Barbara L. Lukermann, AM
Lee W. Munnich, M2
Joseph H. Nathan, M2
Timothy Penny, AM
Sharon Sayles Belton, AM
Paul C. Stone, AM

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The M.S. program provides students with an understanding of the role of science and technology in food and health, the economy, energy and the environment, security, and education; the impact of science and technology on the political and economic relationships among nations; and the analysis and design of policies for appropriate promotion and regulation of science and technology regionally, nationally, and internationally. The program educates students with natural and social science backgrounds to assume roles in public policy development. An M.S./juris doctor dual degree program is available.

Prerequisites for Admission—Students typically have undergraduate degrees or advanced coursework in one of the natural or engineering sciences. They are also expected to have completed the equivalent of an introductory course in microeconomics, one semester of calculus and have a U.S. bachelor’s degree or foreign equivalent.

Special Application Requirements—In addition to the materials submitted to the Graduate School, applicants must submit to the Humphrey Institute a photocopy of the Humphrey Graduate School application, the Humphrey Institute Applicant Data Form, copies of all academic transcripts, a statement of purpose, at least three letters of recommendation, a GRE official score report, and a professional résumé or C.V. Students who wish to be considered for financial aid should apply no later than January 5 of the preceding academic year. Entry is for fall semester.

Courses—Please refer to Public Affairs (PA) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx courses toward degree requirements is permitted with instructor’s and adviser’s permission.

M.S. Degree Requirements
The M.S., which is offered under both Plan A (thesis) and Plan B (without thesis), requires 40 credits including at least 21 credits in five core areas—12 credits in the area of science, technology, and environmental policy and 9 credits of the politics of public affairs, economic reasoning, and empirical analysis. Students should take an additional 6 credits to complement their previous training: appropriate courses in natural or engineering science or its history or philosophy for those with social science backgrounds; appropriate courses in the social sciences for those with natural or engineering science backgrounds. Plan A also requires 10 thesis credits. Plan B requires completion of a Plan B paper (3 credits). The remaining elective credits are chosen in consultation with the student’s adviser. Students may pursue a minor.

Language Requirements—None.

Final Exam—The final exam is oral.

Scientific and Technical Communication
See Rhetoric and Scientific and Technical Communication.

Scientific Computation

Contact Information—Director of Graduate Studies, 139 Smith Hall, 207 Pleasant St. S.E., Minneapolis, MN 55455 (612-626-0769; fax 612-626-7541; www.scicomp.umn.edu). For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Regents Professor
Daniel D. Joseph, Aerospace Engineering and Mechanics, SM
L. E. Scriven, Chemical Engineering and Materials Science, SM

Professor
Ronald E. Anderson, Sociology, SM
Douglas N. Arnold, Mathematics, SM
Daniel L. Boley, Computer Science and Engineering, SM
Graham V. Candler, Aerospace Engineering and Mechanics, SM
James R. Chelikowsky, Chemical Engineering and Materials Science, SM
J. Bernardo Cockburn, Mathematics, SM
Christopher J. Cramer, Chemistry, SM
Jeffrey J. Derby, Chemical Engineering and Materials Science, SM
Timothy J. Ebner, Neuroscience, SM
Jiali Gao, Chemistry, SM
Efi Foufoula-Georgiou, Civil Engineering, SM
Apostolos P. Georgopoulos, Neuroscience, SM
Alexander Y. Grosberg, Physics and Astronomy, SM
Thomas W. Jones, Astronomy, SM
Daniel J. Kersten, Psychology, SM
Vipin Kumar, Computer Science and Engineering, SM
Degree Programs and Faculty

David J. Lilja, Electrical and Computer Engineering, SM
John S. Lowery, Mathematics, SM
Mitchell B. Lukin, Mathematics, SM
John L. Nieber, Biosystems and Agricultural Engineering, SM
Hans G. Othmer, Mathematics, SM
N. P. Papanikolopoulos, Computer Science and Engineering, SM
Haesun Park, Computer Science and Engineering, SM
Yousef Saad, Computer Science and Engineering, SM
Guillermo R. Sapiro, Computer Science and Engineering, SM
George R. Sell, Mathematics, SM
J. Ilja Siewmann, Chemistry, SM
Jaideep Srivastava, Computer Science and Engineering, SM
Harlan W. Stech, Mathematics and Statistics, Duluth, SM
David D. Thomas, Biochemistry, SM
Luke Jon Tierney, Statistics, SM
Donald G. Truhlar, Chemistry, SM
Vaughan R. Voller, Civil Engineering, SM
George L. Wilcox, Neuroscience, SM
Paul R. Woodward, Astronomy, SM
David A. Yuen, Geology and Geophysics, SM

Associate Professor
Victor H. Barocas Biomedical Engineering, SM
David M. Ferguson, Medicinal Chemistry, Pharmacognosy, SM
Darrin M. York, Chemistry, SM

Assistant Professor
Bagrat Amirikian, Neuroscience, M2
George Karypis, Computer Science and Engineering, M2
Mahesh Krishnan, Aerospace Engineering, SM
Norman J. Trouiller, Computer Science and Engineering, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—This program encompasses coursework and research on the fundamental principles for using intensive computation to support research in the physical, biological, and social sciences and engineering. Emphasis is on research issues, state-of-the-art methods, and applying these methods to outstanding problems in science, engineering, and other fields that use scientific computation, numerical analysis and algorithm development, symbolic and logic analysis, high-performance computing tools, supercomputing and heterogeneous networks, and visualization. A handbook that describes the program and degree requirements in detail is available from the program.

Prerequisites for Admission—Applicants fill out a form provided by the program as well as applicable Graduate School forms. A bachelor’s degree in a field that uses scientific computation is required for admission.

Special Application Requirements—Applicants must submit scores from the General Test of the GRE; three letters of recommendation from persons familiar with their scholarship and research potential; a complete set of official transcripts; and a clearly written statement of career interests, goals, and objectives. Students may apply at any time; however, submission of all application materials by January 1 is strongly encouraged to ensure priority consideration for fellowships and assistantships.

Courses—Please refer to the Scientific Computation (SciC) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Inclusion of 4xxx courses on degree program forms is subject to adviser and director of graduate studies approval. Students from other majors may include such courses subject to their own program’s approval.

M.S. Plan A Degree Requirements
The program is offered under Plan A (thesis), which includes a minimum of 20 course credits and 10 thesis credits. The course credits must include at least 6 credits from the scientific computation core and at least 6 credits in a minor. Only 3 credits from courses offered in a student’s minor may be counted toward the core requirements in scientific computation. A course listed in both the core requirements of scientific computation and a student’s minor may not be counted under both.

Language Requirements—None.

Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—The master’s minor requires approval of the director of graduate studies and a minimum of 4 credits from the core curriculum; the credits may not be from courses in the student’s major field.

Ph.D. Degree Requirements
A minimum of 24 course credits is required with a minimum of 12 credits in core courses; 24 thesis credits are also required. Students have two options:

1) Ph.D. with supporting program. In addition to the core credits, this option requires 12 credits in subjects that support computational science—these can include core credits beyond the required 12 credits.

2) Ph.D. with minor. In addition to the core credits, this option requires 12 credits in a minor. Many minor programs require more than 12 credits; in such cases, the greater requirements will be in effect. The minor field must be declared before the student takes the preliminary oral exam.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires approval of the director of graduate studies and a minimum of 12 credits (a minimum of 6 of these in core courses with remaining credits from supplementary courses). A student may use one course from their major field to satisfy the requirement of a minor in scientific computation, provided there is no rule prohibiting this in the student’s major field.

Social, Administrative, and Clinical Pharmacy

Contact Information—College of Pharmacy, University of Minnesota, 7-155 Weaver-Densford Hall, 308 Harvard Street S.E., Minneapolis, MN 55455 (612-624-2973; fax 612-625-9318; kcsao001@umn.edu).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/stepl.asp.

Professor
Barbara Brandt, Pharmaceutical Care and Health Systems, SM
Robert J. Cipolle, Pharmaceutical Care and Health Systems, SM
James C. Floyd, Experimental and Clinical Pharmacology, SM
Judith M. Garrard, School of Public Health, SM
Cynthia R. Gross, Experimental and Clinical Pharmacology, SM
David R. Guay, Experimental and Clinical Pharmacology, M2
Ronald S. Hadsall, Pharmaceutical Care and Health Systems, SM
Thomas E. Lackner, Experimental and Clinical Pharmacology, M2
Tom Alan Larson, Pharmaceutical Care and Health Systems, SM
Henry J. Mann, Experimental and Clinical Pharmacology, SM
Peter C. Morley, Pharmaceutical Care and Health Systems, SM
Paul L. Ranelli, Pharmaceutical Care and Health Systems, SM
Rory P. Remmel, Medicinal Chemistry, SM
John C. Rotschafer, Experimental and Clinical Pharmacology, M2
Ronald Sawchuk, Experimental and Clinical Pharmacology SM
Jon C. Schommer, Pharmaceutical Care and Health Systems, SM
Stephen W. Schondelmeyer, Pharmaceutical Care and Health Systems, SM
Stuart M. Speedie, Health Informatics, Medical School, SM
Linda M. Strand, Pharmaceutical Care and Health Systems, SM
Timothy S. Tracy, Experimental and Clinical Pharmacology, SM
Donald L. Uden, Pharmaceutical Care and Health Systems, M2
Vernon E. Wockwerth, Health Services Administration, SM
Cheryl L. Zimmerman, Pharmaceutics, SM
Adjunct Associate Professor
Sawwakon Ratanawijitrasin, Pharmaceutical Care and Health Systems, AM
Thomas S. Rector, College of Pharmacy, AM2

Assistant Professor
Margaret Artz, Experimental and Clinical Pharmacology, M2
Richard R. Cline, Pharmaceutical Care and Health Systems, M2
Mark Kirstein, Experimental and Clinical Pharmacology, M2
Michael Kofler, Experimental and Clinical Pharmacology, M2
Marnie L. Peterson, Experimental and Clinical Pharmacology, SM
Debra J. Skaar, Experimental and Clinical Pharmacology, M2
Marcia M. Worley-Louis, Pharmaceutical Care and Health Systems, M2
Heather E. Wynn Vezina, Experimental and Clinical Pharmacology M2
Samuel Wagner, Pharmaceutical Care and Health Systems, AM2

Adjunct Assistant Professor
Purée Anantachoti, Pharmaceutical Care and Health Systems, AM
Chulapon Limwattananon, Pharmaceutical Care and Health Systems, AM
Sapon Limwattananon, Pharmaceutical Care and Health Systems, AM
Craig Weinert, Experimental and Clinical Pharmacology, AM2

Clinical Professor
Daniel E. Keyler, Experimental and Clinical Pharmacology, AM2

Clinical Assistant Professor
Angeline M. Carlson, Pharmaceutical Care and Health Systems, M2

Other
Deborah A. Wingert, Pharmaceutical Care and Health Systems, AM2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—Students are prepared for research and related activities investigating relationships between biological and physical factors in social settings that involve the drug use process. This flexible interdisciplinary program uses the resources of the University's many health and social science departments. Programs include courses and offerings from public health, geriatrics, management, sociology, psychology, and public affairs.

The program focuses on the discovery and dissemination of new knowledge to foster appropriate use of drugs in order to improve patient outcomes at the individual and societal level. Students are educated and mentored to become professional scientists. Those who complete the program will understand the process of conducting high quality research and problem solving through the application of disciplinary and interdisciplinary knowledge, theory, and research methodology.

Two program tracks are available. The emphasis of the social and administrative pharmacy (SAPh) track is the application of behavior-oriented interdisciplinary theories to pharmacy problem solving and pharmacy system development. This includes the study of the social, psychosocial, political, legal, public policy, historic, and economic factors that impinge upon the use, non-use, and abuse of drugs.

The emphasis of the experimental and clinical pharmacology (ECP) track is to advance the science of human pharmacology and therapeutics to improve the safe, effective, and economical use of drugs by patients. This includes the translation of both laboratory and clinical research to the medical use process.

Prerequisites for Admission—Although the majority of students in the program are pharmacists, a pharmacy education is not required. A bachelor’s degree or its foreign equivalent from a recognized college of pharmacy and a strong scholastic record are desirable. Individuals from other fields such as economics, engineering, computer science, medicine, psychology, sociology, or public health may be admitted if their undergraduate coursework satisfies the prerequisites for graduate coursework.

Special Application Requirements—Applicants must complete a department supplementary application form in addition to the Graduate School forms. The supplementary form along with three letters of recommendation should be sent directly to the department. GRE scores are required and a performance level of 580 is preferred on the TOEFL for all international applicants whose native language is not English.

Courses—Please refer to Social, Administrative, and Clinical Pharmacy (SACP), Social and Administrative Pharmacy (SAPh), and Experimental and Clinical Pharmacology (ECP) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx courses towards degree requirements is permitted with director of graduate studies approval.

M.S. Degree Requirements
The M.S. program is offered under Plan A and Plan B. Plan A requires at least 31 credits, including 15 credits in the major field, at least 6 credits in a minor or related field, and 10 thesis credits.

Plan B requires at least 30 credits, including 15 credits in the major field and at least 6 credits in a minor or related field; the balance of coursework is determined by agreement between the student and adviser. Plan B also requires two papers of publishable quality; one paper must include a research component with an analysis of data.

Language Requirements—None.

Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—A master’s minor requires 6 credits in program courses, which is determined in consultation with the director of graduate studies.

Ph.D. Degree Requirements
The Ph.D. requires 34 credits in the major, 12 credits in a minor or supporting program, and 24 thesis credits. Two preliminary written exams are required: one concentrates on research design, methodological issues, and statistical analysis, the other on material specific to the student’s chosen track. Students must also pass a preliminary oral exam.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires a minimum of 12 credits in program courses determined in consultation with the director of graduate studies.

Social and Philosophic Studies of Education

Minor Only

Contact Information—Department of Educational Policy and Administration, University of Minnesota, 330 Wulling Hall, 86 Pleasant Street S.E., Minneapolis, MN 55455 (612-624-1086; fax 612-624-3377; http://education.umn.edu/edp).
Degree Programs and Faculty

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
John J. Cogan, Educational Policy and Administration, M
Jean A. King, Educational Policy and Administration, M
Darrell R. Lewis, Educational Policy and Administration, M
Josef A. Mestenhauser (emeritus), Educational Policy and Administration, AM
R. Michael Paige, Educational Policy and Administration, M
Karen Rose Seashore, Educational Policy and Administration, M

Associate Professor
Arthur M. Harkins, Educational Policy and Administration, M

Curriculum—The graduate minor provides a multidisciplinary foundation for the study of education from the perspectives of history, philosophy, and the social sciences. The minor program is shaped to suit the particular needs and interests of the student at either the master’s or doctoral level. In consultation with a faculty member in social and philosophic studies of education in the Department of Educational Policy and Administration (EdPA), 5xxx and 8xxx courses are selected both in EdPA and in related fields.

Prerequisites for Admission—Admission is contingent upon prior admission to a master’s or doctoral degree-granting program within the Graduate School. Interested students should consult with a faculty member in social and philosophic studies of education in the Department of Educational Policy and Administration to develop a proposed course of study.

Special Application Requirements—The director of graduate studies in the Department of Educational Policy and Administration must approve the applicant’s proposed course of study by signing the student’s degree program form.

Courses—Please contact the minor program office for information on relevant coursework.

Use of 4xxx Courses—Inclusion of 4xxx courses on degree program forms is subject to adviser and director of graduate studies approval.

Minor Only Requirements
M.A. students must complete at least 9 graduate credits (at least one course each) in the two areas of study below. Doctoral students must complete at least 12 graduate credits (at least two courses each) in the two areas of study.

Area I—history and philosophy of education: EdPA 5021, 5023, 5024, 5028, 5032, Phil 4324, WoSt 5103.
Area II—social sciences and education: EdPA 5041, 5044, 5103, 5128, 5302, 5352, 8104.

Social Work

Contact Information—School of Social Work, University of Minnesota, 105 Peters Hall, 1404 Gortner Avenue, St. Paul, MN 55108 (612-625-1220 or 1-800-779-8636; fax 612-624-3744; reinard@che.umn.edu.

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
Michael Baizerman, SM
Jeffrey L. Edleson, SM
Jane F. Gilgun, SM
C. David Hollister, SM
Rosalie A. Kane, Public Health, SM
Helen Q. Kivnick, SM
David J. Klaassen, AM2
Dario Menanteau-Horta, SM
Jean K. Quam, SM
Ronald H. Rooney, SM
Mark S. Umbrecht, SM
Esther Wattenberg (emeritus), ASM
Susan Wells, SM
Oliver J. Williams, SM

Associate Professor
William Bradshaw, SM
Linda E. Jones, SM
James R. Reinard, SM
Edward Taylor, M2

Assistant Professor
Laura Abrams, MA2
Mark G. Frezel, AM
Priscilla Gibson, M2
Elizabeth Lightfoot, M2
Yat-Sang (Terry) Lum, M2

Instructor
Eileen Arnold, M2

Other
Sonia Davila-Williams, M2
M. J. Gilbert, M2
Trude D. Hendrickson, M2
Nancy J. Johnston, M2
Nan L. Kalk, M2
Marilyn Luptak, M2
Janelle Rae Miedema, M2
Megan H. Morrissey, M2
Victoria Van Slyke, M2
Mary Weeks, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The M.S.W. prepares students for advanced social work practice. A 50-credit program and a 34-credit advanced standing program are available. The curriculum offers concentrations in direct or community practice. The School of Social Work and the Humphrey Institute of Public Affairs offer two dual master’s degrees: the master of social work/master of public policy (M.S.W./M.P.P.), and the master of social work/master of urban and regional planning (M.S.W./M.U.R.P.). Dual degree students generally take coursework in each department for the first two years, and in the third year, take courses concurrently in two departments, facilitating the integration of content from both fields. Students may apply some credits taken in the dual degree programs toward requirements in both departments. Each dual degree option is a minimum sequence of three years of full-time study. Students who choose an M.S.W. concentration in direct practice will need longer than six semesters to complete both programs. Students may begin their studies in either program.

A dual master of social work/master of public health (M.S.W./M.P.H.) is offered with the School of Public Health. The M.S.W./M.P.H. degree provides exposure to a blend of course offerings in biometry, community health education, environmental health, epidemiology, health services administration, maternal and child health, and public health nutrition. The purpose of this degree is to educate and prepare professional public health social workers that are competent in the practice of professional social work with the additional outlook, skills, and expertise of public health. Students are able to complete the requirements for both degrees in approximately six to eight academic semesters or less, depending upon the number of credits carried each semester.

The Ph.D. program prepares students to provide intellectual leadership for the social work profession through advanced levels of scholarship, research, theory development, and policy analysis. Students are expected to acquire skill in research design and statistics and to develop a comprehensive knowledge of social work and social welfare history, theory, and policy. The Ph.D. program does not focus on the development of advanced skills for clinical practice. However, students gain knowledge of practice theory and research related to social work practice. Many graduates assume positions as university faculty. Consequently, the program offers opportunities for students to acquire skills in teaching and curriculum development.

Prerequisites for Admission—Applicants to the MSW program must have a background in the liberal arts that includes coursework in history and social sciences, the humanities and the arts, physical and biological sciences and mathematics and a college-level course in statistics. A college-level biology course with content on human anatomical and physiological development is also required. Strong preference is given to applicants with paid or volunteer experience in social service settings. Please review the current application packet available on the School of Social Work Web site at http://ssw.che.umn.edu/ for the most current application requirements. Doctoral applicants must meet requirements and standards set by the Graduate School and the School of Social Work. It is preferred that applicants
have earned the master’s degree in social work from a school of social work accredited by the Council on Social Work Education; however, applicants with a master’s degree in a closely related discipline will be considered for admission. Preference is also given to candidates with at least two years of post-M.S.W. practice experience. Candidates for the Ph.D. program who do not have an M.S.W. may be required to take several master’s level foundation courses.

Special Application Requirements—Three letters of recommendation, a résumé documenting social service experience, a complete set of transcripts (in addition to that required by the Graduate School), an example of academic or scholarly writing, a personal statement, and a department application form are required of all applicants. GRE scores are not required for admission to the master’s program, but are required from applicants who do not have an official grade point average from their undergraduate degree. GRE scores are required for admission to the Ph.D. program. The application deadline for the M.S.W. program and for the Ph.D. program is in early January. The Ph.D. program has a second review deadline in early March. Beginning students in either program are admitted fall semester only. Please check the School of Social Work Web site at http://sww.ch.umn.edu/ for specific dates.

Courses—Please refer to Social Work (SW) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx Courses toward degree requirements is permitted with director of graduate studies approval.

M.S.W. Coursework Only Degree Requirements

The M.S.W. requires 50 credits; a 34-credit advanced standing program is available to graduates of undergraduate social work programs accredited by the Council on Social Work Education. All credits for the M.S.W. can be completed in two years of full-time study, or three years of part-time study, and must be completed within seven years of the date of the earliest coursework taken for the degree. The 50-credit program includes a set of required foundation courses (25 credits), courses from a selected concentration, two field internships, and social work electives. A maximum of 24 credits may be transferred from the following sources with School of Social Work approval: up to 8 credits as a non-degree seeking student registered for social work graduate credit at the University of Minnesota; up to 6 credits as a non-degree seeking student registered for social work graduate credit at the University of Minnesota.

Language Requirements—None.

Ph.D. Degree Requirements

The Ph.D. program emphasizes mastery of student-and program-determined objectives rather than an accumulation of course credits. Degree requirements vary according to program and field. Typically 40 credits plus 24 required thesis credits beyond the M.S.W. are required. Required courses include core seminars in social work research, social welfare history, social welfare policy, and theory and model development; a social work teaching course; a supervised research practicum and practicum seminar; supporting program courses; statistics courses. Students must also have teaching experience in the School of Social Work while in the program and fulfill the computer skills requirement.

Language Requirements—None.

Sociology

Contact Information—Graduate Program Assistant, Department of Sociology, University of Minnesota, 909 Social Sciences Building, 267 19th Avenue S., Minneapolis, MN 55455 (612-624-2093; fax 612-624-7020; socdept@atlas.socisci.umn.edu). For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp

Regents Professor
Joanne B. Eicher, Design, Housing, and Apparel, AM2

Professor
Ronald R. Amiazade, SM
Ronald E. Anderson, SM
John Arthur, Sociology-Anthropology, Duluth, AM2
Barry C. Feld, Law School, AM2
David Knoke, SM
Candace M. Kruttschnitt, SM
Theodor J. Litman, Health Care Management, AM2

Associate Professor
Elizabeth H. Boyle, SM
Rose M. Brewer, African American and African Studies, AM2
Jeffrey P. Broadbelt, SM
Kathleen T. Call, Public Health, AM2
Penny A. Edgell, SM
Scott R. Eliason, SM
Michael R. Goldman, M2
Douglas Hartmann, SM
Walt Jacobs, AM2
Ian R. Macmillan, SM
Jennifer L. Pierce, ASM
Rachel Schurman, M2
John R. Warren, M2

Adjunct Associate Professor
Michael David Finch, AM2

Assistant Professor
Joseph Gerteis, M2
Ann M. Hironaka, M2
Kathleen E. Hull, M2
Erin L. Kelly, M2
Jeffrey Robert Maahs, AM
Ann Meier, M2
Evan A. Schofer, M2
Teresa T. Swartz, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—Sociology is concerned with the study of human societies, groups, and social life. The program offers substantive training in five areas of specialization: family and life course; inequality—race, class, and gender; crime and deviance; organizations, work, and markets; political sociology and social movements. Methodological training is available in historical and comparative research, survey research, network analysis, advanced statistical analysis, and qualitative research. Training for students interested in both academic and applied employment is generally available.

Prerequisites for Admission—A background in basic sociology, usually consisting of the equivalent of 18 credits in undergraduate work, including 9 credits of social science statistical methods, or an M.A. degree in sociology or a closely related field is recommended. Individuals who have completed fewer than 18 credits may be admitted but are generally required to complete background coursework in theory and statistics during their first year of residence.

Special Application Requirements— Applicants are evaluated on their general academic potential, commitment to the field, creativity, and potential for contribution to the field. In addition to the Graduate School application, applicants must submit the following: valid GRE scores; a complete set of transcripts in addition to that required by the Graduate School; a departmental application; a sample of written work, usually a term paper, written in English; three
Degree Programs and Faculty

Letters of recommendation; and a statement of professional objectives. The department accepts new students for fall admission only. The final application deadline for admittance and financial aid is December 1.

Courses—Please refer to Sociology (Soc) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx courses is not permitted toward degree requirements.

M.A. Degree Requirements

Students are admitted only for the Ph.D.; the M.A. is an optional degree for students in the doctoral program.

Students take six required courses or their equivalent (17 credits) and two additional substantive courses in sociology (6 credits). Substantive courses are chosen in consultation with the adviser and program committee to meet the student’s educational and professional goals. Students must also complete a minimum of 6 credits in a minor or related field. Plan B students submit two papers, at least one of which is empirical. Plan A requires 10 thesis credits.

Language Requirements—None.

Final Exam—The final exam is oral.

Ph.D. Degree Requirements

The doctoral program is for students planning to do research or teach.

Students take five required courses or their equivalent (14 credits), including two courses on professional skills development. Beyond that, each student’s program is individually planned in consultation with the adviser and program committee to meet both the student’s goals and broad program requirements. Those requirements include four substantive courses in sociology (12-credit minimum) and at least one semester of training in advanced methods (3-credit minimum). Students must also complete a minimum of 12 credits in a minor or supporting program and 24 thesis credits.

Students who enter the program with an M.A. in sociology must earn a minimum of 18 credits in the department regardless of the number of courses for which they have petitioned equivalents from other institutions. Students must prepare for a written examination in two of the department’s major research interest areas. The selections must be logically related to the student’s major work. Three representatives from the sociology department must serve on the student’s preliminary oral examining and prospectus hearing committees.

Language Requirements—Coursework in a foreign language may be used as outside coursework for those students who plan research in comparative sociology.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires four courses in sociology, at least one of which is 8xxx. Course choices are subject to the approval of the director of graduate studies.

Software Engineering

Contact Information—Software Engineering Graduate Program, University of Minnesota Software Engineering Center, 200 Union Street SE, 4-192 EE/CS Building, Minneapolis, MN 55455 (612-625-1381; fax 612-625-0572; kkramer@cs.umn.edu [www.msse.umn.edu]).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor

John V. Carlis, M2
Joseph A. Konstan, M2
Shashi Shekhar, M2
Jaideep Srivastava, M2

Associate Professor

Mats P. E. Heimdahl, M2
Richard M. Voyles, AM2

Assistant Professor

John E. Collins, M2

Instructor

Neil A. Bitzenhofer, AM2
Michael Calvo, AM2
Jesse D. Freese, AM2
Richard Hedger, AM2
Stephen Kan, AM2
John Kruse, AM2
Kevin Larsen, AM2
Elizabeth M. Sisley, AM2
John Skovbroten, AM2
Michael W. Wold, AM2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The master of science in software engineering (M.S.S.E.) program provides a thorough understanding of the fundamental issues related to software development and the software development process. It fosters an awareness of the problems and opportunities associated with software-intensive systems and explains the methods for quickly evaluating, adopting, and taking advantage of emerging technologies. This program introduces emerging technologies and their applications and lays the foundation for lifelong learning and professional development in a rapidly changing field. The M.S.S.E. program is an interdisciplinary program administered by the Institute of Technology’s Department of Computer Science and Engineering.

The program is offered in a format designed for full-time working professionals. Students take courses one day per week (alternating Fridays and Saturdays) and move through the curriculum as a cohort, taking all classes together for the first three semesters.

Prerequisites for Admission—Prospective students should have an undergraduate degree in computer science or a closely related field and a minimum of one year of professional experience working in the software industry. Students with degrees in other fields may be considered for admission based on extensive industrial experience.

Courses—Please refer to Software Engineering (SEng) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx Courses toward degree requirements is subject to adviser and/or director of graduate studies approval.

M.S.S.E. Plan B Degree Requirements

The M.S.S.E. requires 30 credits, including 27 credits of regular coursework and 3 credits for the Plan B project. Students take seven core courses, two or three industrial seminar courses, two or three elective courses, and a capstone course (Plan B project) where students undertake a challenging project.

Language Requirements—None.

Final Exam—The final exam is oral.

Soil Science

Contact Information—Director of Graduate Studies, Department of Soil, Water, and Climate, University of Minnesota, 439 Borlaug Hall, 1991 Upper Buford Circle, St. Paul, MN 55108 (612-625-1244; fax 612-625-2208; dgs@soils.umn.edu [www.Soils.umn.edu]).

Professor

Deborah L. Allan, SM
James L. Anderson, SM
Jay C. Bell, SM
Paul R. Bloom, SM
Terence H. Cooper, SM
Peter H. Graham, SM
Satish C. Gupta, SM
Thomas Halbach, M2
John A. Lamb, SM
Gary L. Malzer, SM
Jean-Alex E. Molina, SM
John F. Moncrief, SM
Paul R. Nater, SM
Edward A. Nater, SM
Gyles W. Randall, SM
George W. Rehm, SM
Carl Rosen, SM
Michael J. Sadowsky, SM
George W. Rehm, SM
Jeffrey S. Strock, M2
Mark W. Seeley, SM

Adjunct Professor

John M. Baker, SM
Charles E. Clapp, SM
William C. Koskinen, SM
Donald C. Reicosky, AM2
Michael P. Russelle, SM

Associate Professor

John V. Carlis, M2
James L. Anderson, SM
Jay C. Bell, SM
Paul R. Bloom, SM
Terence H. Cooper, SM
Peter H. Graham, SM
Satish C. Gupta, SM
Thomas Halbach, M2
John A. Lamb, SM
Gary L. Malzer, SM
Jean-Alex E. Molina, SM
John F. Moncrief, SM
Paul R. Nater, SM
Edward A. Nater, SM
Gyles W. Randall, SM
George W. Rehm, SM
Carl Rosen, SM
Michael J. Sadowsky, SM
Michael A. Schmitt, SM
Carl Rosen, SM
George W. Rehm, SM
Jeffrey S. Strock, M2
Mark W. Seeley, SM

Adjunct Professor

John M. Baker, SM
Charles E. Clapp, SM
William C. Koskinen, SM
Donald C. Reicosky, AM2
Michael P. Russelle, SM

Associate Professor
Admitted in any semester.

Students whose native language is not English are expected to have ranked in the top 20.

The major fields.

Curriculum—The program offers two concentrations: soil science and climatology. This multidisciplinary program encompasses aspects of chemistry, physics, biology, atmospheric sciences, and geology. The discipline is divided into five subdisciplines: climatology, soil chemistry/fertility, soil classification/genesis, soil microbiology/biochemistry, and soil physics. The soil science concentration focuses on the study of soil as it applies to environmental and agricultural issues. The climatology concentration focuses on the interdisciplinary study of earth-atmosphere interactions as well as climate variability as it applies to environmental and agricultural issues. This concentration requires competence in both atmospheric sciences and related areas of soil science. The minor, supporting, or related fields area is usually selected from some allied field such as agronomy, botany, chemistry, microbiology, biochemistry, physics, geology, economics, forestry, agricultural engineering, or atmospheric science.

Prerequisites for Admission—The academic background normally required includes standard courses in college physics, chemistry, geology, microbiology, and mathematics, including one course in calculus, and an introductory course in soil science. For agricultural climatology, additional courses in mathematics, physics, meteorology, and engineering may be substituted. Candidates for the Ph.D. degree are normally required to have completed an acceptable master’s degree thesis.

Special Application Requirements—A statement of career goals and three letters of recommendation evaluating the applicant’s potential for graduate study should accompany applications to both the M.S. and Ph.D. programs. Submission of GRE scores is required of all native English speakers and is strongly recommended for nonnative speakers (in addition to the TOEFL requirement); students whose native language is not English are expected to have ranked in the top 20 percent of their class. Students may be admitted in any semester.

Program-specific requirements and procedures for electronic application for admittance to the soil science graduate program are listed and updated on the department’s Web site at www.soils.umn.edu.

Use of 4xxx Courses—Use of 4xxx courses is permitted toward degree requirements per adviser and/or director of graduate studies approval.

Courses—Please refer to Soil, Water, and Climate (Soil) in the course section of this catalog for courses pertaining to the program or at the departmental Web site for an updated list of courses.

M.S. Degree Requirements

All M.S. students must complete a minimum of 30 credits: 14 credits in the major area, one seminar (1 credit) teaching experience, and a minimum of 6 credits in a minor or related field. Plan A students must take a minimum of 10 thesis credits: Plan B students must complete a Plan B paper and fulfill the 30 credit minimum by taking 10 credits of coursework or a special project to replace the 10 thesis credits.

Plan A students in the soil science concentration must take three out of the four core courses in soil science. Plan A students in the climatology concentration must take two or more course in climatology or atmospheric sciences (approved by the student’s advisory committee) and two of the four core courses in soil science. Plan B students in the soil science concentration must take all four core courses in soil science. Plan B students in the climatology concentration must take three or more courses in climatology or atmospheric sciences (approved by the student’s advisory committee) and two of the four core courses in soil science.

Language Requirements—none.

Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—Students may minor in soil science with the approval of the director of graduate studies and under the direction of a soil science graduate faculty member serving as the minor adviser. The master’s minor requires completion of a minimum of two of the four core area courses in soil science and a seminar.

Ph.D. Degree Requirements

Students must take two seminars (1 credit each), 2 credits of teaching experience, a minimum of 12 credits in a minor or supporting program, and 24 thesis credits. Students in the soil science concentration must take all four core area courses in soil science. Students in the climatology concentration must take a minimum of two courses in climatology or atmospheric sciences (approved by the student’s advisory committee) and two of the four core area courses in soil science.

Language Requirement—None.

Minor Requirements for Students Majoring in Other Fields—Students may minor in soil science with the approval of the director of graduate studies and under the direction of a soil science graduate faculty member serving as the minor adviser. The doctoral minor requires a minimum of 12 credits in soil science, including a minimum of three of the four core area courses in soil science, a seminar, and teaching experience.

South Asian Languages

See Asian Literatures, Cultures, and Media.

Spanish

See Hispanic and Luso-Brazilian Literatures and Linguistics.

Special Education

See Educational Psychology.

Speech-Language-Hearing Sciences

Contact Information—Department of Speech-Language-Hearing Sciences, University of Minnesota, 115 Shevlin Hall, 164 Pillsbury Drive S.E., Minneapolis, MN 55455 (612-624-3322; fax 612-624-7586; slhs@umn.edu; www.slhs.umn.edu). For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp

Professor

Arleen E. Carney, SM
Karlind T. Moller, SM
David A. Nelson, ASM
Joe E. Reichle, SM
Charles E. Speaks, SM
Dianne Van Tasell, ASM
Jennifer Windsor, SM

Associate Professor

David A. Fabry, AM
Mary R. T. Kennedy, M2
Kathryn Kohnert, M2
Peggy B. Nelson, M2
Robert S. Schlauch, SM

Assistant Professor

Benjamin Munson, M2
Timothy D. Trine, AM
Peter Watson, M2

Clinical Specialist

Leslie E. Glaze, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.
Curriculum—Emphasis in the master’s program is speech-language pathology. Emphases in the Ph.D. programs are speech-language pathology, speech science, language science, audiology, and hearing science.

The emphases in the Au.D. program focuses on meeting the standards for certification as an audiologist by the American Speech-Language-Hearing Association. The program emphasizes outcome-based learning activities that prepare graduates to interpret research findings and incorporate them into clinical practice. Coursework and clinical education focus on diagnostic, rehabilitative techniques, technology counseling approaches and human development.

Prerequisites for Admission—Prospective students must have completed an undergraduate degree. Individuals from speech-language-hearing sciences or other academic areas are welcome. Students entering the M.A. program with minimal background in speech-language-hearing sciences should expect their program to extend beyond the usual two years.

Special Application Requirements—Three letters of recommendation evaluating the applicant’s scholarship (two from professional-rank faculty are recommended), a complete set of transcripts (in addition to that required by the Graduate School), and GRE scores are required. TOEFL is required for nonnative English speaking applicants. Deadline for application to the master’s and Au.D. programs is January 1; late applications are considered only if space is available. Master’s students ordinarily begin graduate study during fall semester. Review of applicants to the doctoral program is continuous.

Courses—Please refer to Speech-Language-Hearing Sciences (SLHS) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Inclusion of 4xxx courses on degree program forms is subject to adviser and director of graduate studies approval.

M.A. Degree Requirements
Emphasis in the master’s program is speech-language pathology, which is accredited by the American Speech-Language-Hearing Association’s Council on Academic Accreditation. Students who complete the M.A. are eligible for clinical certification by the American Speech-Language-Hearing Association. Students may select between two M.A. options. Plan A requires coursework and a thesis that is experimental in nature. Plan B requires coursework, a comprehensive written examination, and an oral examination.

Language Requirements—None.
Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—A minimum of 15 credits, approved by the director of graduate studies, is required for a master’s minor.

Au.D. Degree Requirements
The Au.D. is a four year plan of study for students entering with a background in speech-language-hearing sciences. Students without a background should expect a more lengthy plan of study. The Au.D. requires a total of 98 semester credit hours. Ninety of these are in the major area of study. Additionally, 8 credits of related field coursework are required. Two summative evaluations must be completed including: 1) a written comprehensive examination during the third year of the program, and, 2) a written Capstone Project that includes an oral presentation and oral defense of the project.

Language Requirements—None.

Ph.D. Degree Requirements
Emphases in the Ph.D. program are speech-language pathology, audiology, speech science, language science, or hearing science. The program prepares students for careers in research, teaching, and advanced clinical applications. Most students entering the program have a master’s degree in speech-language pathology, audiology, or a related area. The Ph.D. degree usually requires three years of work beyond the master’s degree. In general, a student’s program is designed by the student in consultation with the adviser to satisfy the particular objectives of the student, but there are also some department and Graduate School requirements that must be satisfied. These include coursework, research activities, teaching experience, and preliminary and final exams.

A minimum of 12 course credits in a minor or supporting program and registration for 24 thesis credits are required. Also required is a statistics sequence, for which students typically register during their first two years. The written and oral preliminary exams are taken at the end of the second year.

Each student completes a seminar (SLHS 8420) and a minimum of 4 credits of teaching experience that provide an opportunity for the student to develop and teach sections of department courses. Students also complete a seminar (SLHS 8410) and a minimum of 4 credits of research under the direction of one or more faculty members in the department other than the adviser.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—A minimum of 15 credits, approved by the director of graduate studies, is required for a doctoral minor.

Statistics

Contact Information—School of Statistics, University of Minnesota, 313 Ford Hall, 224 Church Street S.E., Minneapolis, MN 55455 (612-625-3046; fax 612-624-8868; info@stat.umn.edu).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/nvpl.aspx.

Professor
Christopher Bingham, SM
R. Dennis Cook, SM
James M. Dickey, SM
Morris L. Eaton, SM
Charles J. Geyer, SM
Douglas M. Hawkins, SM
Glen D. Meeden, SM
Christopher J. Nachtsheim, Operations and Management Science, SM
Gary W. Oehlert, SM
Ronald R. Regal, Mathematics and Statistics, Duluth, SM
Xiaotong Shen, SM
William D. Suderth, SM
Sanford Weisberg, SM

Associate Professor
Birgit Grund, SM
Tiefeng Jiang, SM
Frank B. Martin, SM
Peihua Qiu, SM
Yuhong Yang, SM

Assistant Professor
Singhanusu Chatterjee, M2
Galin Jones, M2
Lan Wang, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The School of Statistics is the primary venue at the University for research, teaching, and dissemination of the theory, methodology, and applications of statistical procedures. Students may specialize in any area of statistics or probability. The core program for all students has strong components of both theoretical and applied statistics.

Prerequisites for Admission—Applicants to the master’s program must be familiar with basic statistical concepts and methods, and with mathematics through multivariable calculus and linear algebra. Applicants to the doctoral program must, in addition to the above, be familiar with the elements of real analysis.

Special Application Requirements—Two letters of recommendation are required. Applicants for financial support (assistantships) must submit scores from the GRE General Test; other applicants are encouraged to submit GRE scores. Applicants whose native language is not English must submit a TOEFL score; applicants should have a score of at least 223
M.S. Plan B Degree Requirements
The program prepares students for jobs in industry and the public sector and also for study at the doctoral level.

During the first year, students take a two-semester theory sequence and a two-semester methods sequence. In addition, they usually take two supporting field courses from other departments.

During the second year, students take an additional 9 credits of approved 5xxx or 8xxx statistics courses; some of this requirement can be satisfied by taking approved courses with heavy statistical content from other departments. Students also take a 3-credit statistical consulting course and complete their Plan B project. A total of at least 30 course credits is required. A written preliminary examination is taken at the beginning of the second year.

Language Requirements—None.

Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—A master’s minor requires at least 9 credits of 5xxx or 8xxx statistics courses. Stat 4101-4102 may be used to satisfy this requirement.

Ph.D. Degree Requirements
Students entering the program with a bachelor’s degree must take at least 60 course credits; students entering with a master’s degree must take at least 43 credits; 24 thesis credits are also required. Students take 41 credits in core courses (27 in statistics, 14 in mathematics), an additional 18 credits of approved 8xxx statistics courses (some of which can be satisfied by taking approved courses with heavy statistical content from other departments), and a 3-credit statistical consulting course.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires a theory sequence (Stat 4101-4102 or Stat 5101-5102) and familiarity with various statistical methods. Typical programs include 14 to 18 credits of graduate-level statistical courses.

Please note: Stat 4101 and 4102 are available to graduate students from other programs, but not to statistics majors.

Strategic Communication

Contact Information—Graduate Studies Office, Strategic Communication M.A. Program, School of Journalism and Mass Communication, University of Minnesota, 111 Murphy Hall, 206 Church Street S.E., Minneapolis MN 55455 (612-625-4054; fax 612-626-8251; sjmgrad@umn.edu).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/index.asp

Professor
John Eighmey, M2
Ronald Faber, M2
Daniel B. Wackman, M2

Associate Professor
Kenneth O. Doyle, M2

Assistant Professor
Jisu Huh, M2
Brian Southwell, M2
Marco Yzer, M2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The M.A. in strategic communication, new in September 2005, emerged from the 1998 Presidential Initiative in New Media. It is designed to serve working communications professionals in advertising, public relations, corporate communications, nonprofit organizations, and government.

The 33-credit program is conceptually and structurally distinct from the existing academic master’s degree in mass communication in that it focuses on advanced professional study of communications strategy, planning, evaluation, and creative management.

The University of Minnesota is one of only a handful of institutions to offer a professional master’s program in strategic communication designed for the busy working professional.

The M.A. in strategic communication curriculum is tailored to provide the best foundation for future communications leaders, recognizing the communication industry is changing rapidly and is more volatile than ever. With the Internet in its infancy, and massive organizational and global forces reshaping the U.S. economy, communications leaders face significant challenges and can prepare themselves by in-depth study of strategic process management.

Prerequisites for Admission—The minimum requirement for admission is a B.A. or equivalent. Professionals in strategic communication—currently employed in an advertising, public relations or marketing firm, or in a communications function within a corporation or nonprofit organization—must have a baccalaureate degree from an accredited U.S. institution or its foreign equivalent and at least two years’ professional experience. This professional experience should be in any of the following areas: account planning, account management, advertising management, media planning or buying, media sales, promotion marketing, corporate communications, public affairs, public relations, investor relations, direct marketing, sales management, marketing management, brand management, market research, or event management.

Special Application Requirements—Applications to both the School of Journalism and Mass Communication and the University of Minnesota Graduate School must be received before June 15. Acceptance is on a rolling basis, with a maximum of 20 students accepted. Applications are processed only when they are complete and accompanied by the application fee, which is nonrefundable.

Courses—Please refer to Journalism and Mass Communications (Jour) in the course section of this catalog for courses pertaining to this program.

Use of 4xxx Courses—Use of 4xxx courses is not permitted.

M.A. Degree Requirements
The M.A. in strategic communication requires 33 semester credits to be completed within 24 calendar months. All students must take the same 18 course credits in communication, and complete the 6-credit individual project. In addition, 9 credits of graduate-level elective studies (at least 6 outside SMJC) must be completed.

Students must maintain a GPA of at least 3.00 and achieve a grade of B or better on their final six-credit project. Student progress is evaluated by the academic director, program coordinator, and program faculty. Students must progress each semester to continue in the program, though a student who unexpectedly must temporarly leave the program can return to the program at a later date and resume their studies at the point of departure. All coursework must be taken A-F.

Language Requirements—Foreign language study is recommended for students who plan to work internationally.

Studies in Africa and the African Diaspora

Minor Only

Contact Information—Department of African American and African Studies, University of Minnesota, 808 Social Sciences Building, 267 19th Avenue S., Minneapolis, MN 55455 (612-624-9847; fax 612-624-9383).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/index.asp
Degree Programs and Faculty

Regents Professor
Joanne B. Eicher, Design, Housing, and Apparel, AM  
Allen F. Isaacman, History, AM

Professor
Samuel Myers, Public Affairs, AM  
August H. Nimtz, Jr., Poltical Science, AM  
Earl P. Scott, Geography, M

Associate Professor
Kelesto E. Atkins, African American and African Studies, M  
Louis R. Bellamy, Theatre Arts, AM  
Rose M. Brewer, African American and African Studies, M  
Roderick Ferguson, American Studies, AM  
Gloria Williams, Design Housing, and Apparel, AM  
Kirt H. Wilson, Communication Studies, AM  
Charles Ben Pike, African American and African Studies, M  
Priscilla Gibson, Women’s Studies, AM  
Keith A. Mayes, African American and African Studies, M  
Gwendolyn Pough, Women’s Studies, AM  
Michele Wagner, History, AM

Assistant Professor
Pearl Barner II, African American and African Studies, M  
Victoria B. Coffman, African American and African Studies, M  
Priscilla Gibson, Women's Studies, AM  
Keith A. Mayes, African American and African Studies, M  
Charles Ben Pike, African American and African Studies, M  
Assistant Professor
Gwendolyn Pough, Women’s Studies, AM  
Michele Wagner, History, AM

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—This interdisciplinary graduate minor is administered through the Department of African American and African Studies. The minor program gives students from a variety of disciplines a structured graduate curriculum that offers a systematic understanding of the contemporary and historical experiences of peoples of Africa and of African descent. It is organized around a group of core seminars and focuses on two broad areas; the humanities and the arts, and the social and behavioral sciences.

Prerequisites for Admission—Admission is contingent upon prior admission to a master’s or doctoral degree-granting program within the Graduate School.

Special Application Requirements—Students must complete an application form by the end of spring semester to be considered for acceptance for the following academic year. It is expected that no more than 15 students will be admitted to this minor each year. An undergraduate major or minor in African American and/or African studies is not required for admission to the program, but students are expected to have had sufficient background to begin graduate level study.

Courses—Please refer to Afro-American Studies (Afro) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx Courses towards degree requirements is subject to adviser and/or director of graduate studies approval.

Minor Only Requirements
Students develop their program in consultation with the director of graduate studies and faculty in Africa and the African diaspora and in their major. All courses must be outside the student’s major field of study.

The master’s minor requires a minimum of 9 graduate credits, including the seminar Afro 5101—Studies in Africa and the African Diaspora. Remaining courses are selected from one of the following two areas: 1) humanities and the arts or 2) behavioral and social sciences.

The doctoral minor requires a minimum of 15 graduate credits, including the seminar Afro 5101—Studies in Africa and the African Diaspora. Students take one additional seminar that focuses on the study of Africa and peoples of African descent. Remaining courses are selected from one of the two areas listed above.

Studies of Science and Technology

Minor Only

Contact Information—Director of Graduate Studies, Studies of Science and Technology, University of Minnesota, 746 Heller Hall, 271 19th Ave. S., Minneapolis, MN 55455; (612)-625-6635; fax (612)-626-8380; mcps@umn.edu  
For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp

Professor
Carl Elliott, Bioethics, M  
John M. Eyer, History of Medicine, M  
Ronald N. Giere, Philosophy, M  
Alan G. Gross, Rhetoric, M  
Laura J. Gurak, Rhetoric, M  
Keith Gunderson, Philosophy, M  
William H. Hanson, Philosophy, M  
Geoffrey Hellman, Philosophy, M  
Jeffrey P. Kahn, Bioethics, M  
Kenneth H. Keller, Center for Science, Technology, Public Affairs, M  
Sally G. Kohlstedt, Geology and Geophysics, M  
Arthur L. Norberg, Computer Science, M  
C. Wade Savage, Philosophy, M  
Naomi Scheman, Philosophy, M  
Robert W. Seidel, Charles Babbage Institute, M  
Alan E. Shapiro, Physics, M

Associate Professor
Bruce P. Braun, Geography, M  
Fred N. Finley, Curriculum and Instruction, M  
Michel H. Janssen, History of Science and Technology, M  
Jean M. Langford, Anthropology, M  
Daniel J. Philippon, Rhetoric, M  
Michael D. Root, Philosophy, M  
C. Kenneth Waters, Philosophy, M

Assistant Professor
Jennifer K. Alexander, Mechanical Engineering, M  
Jennifer Lee Gunn, History of Medicine, M  
Hiromi Mizuno, History, M  
John B. Shank, History, M  
Karen Sue Tausissi, Anthropology, M

Curriculum—Studies of science and technology (SST) deals with a rapidly expanding field that seeks to understand the conceptual foundations, historical development, and social dimensions and context of science and technology. SST faculty are drawn from a number of research and teaching units dedicated in whole or in part to the history, philosophy and social studies of science and technology. The SST minor is for students from any major who want to gain a deeper understanding of the nature and development of science and technology.

The SST minor provides introductory core courses in historiography and philosophy of science, followed by research seminars and other elective courses in four main research areas: models, theories, and reality; physical science; biological and biomedical sciences; and science, technology, and society. Seminar topics vary yearly depending on faculty and student interest.

Prerequisites for Admission—Admission is contingent upon prior admission to a master’s or doctoral degree-granting program within the Graduate School and is by permission of the director of graduate studies in SST.

Special Application Requirements—Prospective students should contact director of graduate studies.

Courses—Please refer to Studies of Science and Technology (SST) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx courses is not permitted toward minor requirements.

Minor Only Requirements
A master’s minor requires 7 graduate credits and a doctoral minor requires 12 graduate credits. Both minors must include HSci 8111; one of either Phil 8601, 8602, or 8605; and SST 8000 Colloquium (one semester for master’s, two for doctoral students). Doctoral students must also take one of the SST seminars (SST 8100, 8200, 8300, 8400, or 8420) in an area primarily outside the student’s major.

Language Requirements—None.

Studio Arts
See Art.
Surgery

Contact Information—Department of Surgery, University of Minnesota, 420 Delaware Street S.E., MMC 195, Minneapolis, MN 55455 (612-626-2590; surgwww@umn.edu).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
Roderick A. Barke, SM
R. Morton Bolman, SM
Henry Buchwald, SM
Frank B. Cerra, SM
David N. Cornfield, M2
Bruce L. Cunningham, M2
Agustin P. Dalmasso, SM
David L. Dunn, SM
William C. Engelandel, SM
John E. Foker, SM
Rainer W. G. Gruessner, M2
Ranjit John, M2
Michael A. Maddaus, M2
Arthur J. Matas, SM
J. Ernesto Molina, M2
William D. Payne, M2
David A. Rothenberger, M2
Daniel Saltzman, M2
Sara J. Shumway, M2
David E. R. Sutherland, SM
Herbert B. Ward, M2

Adjunct Professor
Arnold S. Leonard, SM
John S. Najarian, SM

Associate Professor
Jerome H. Abrams, M2
Gregory J. Beilman, M2
Bernhard J. Hering, M2
Gregory J. Beilman, M2

Assistant Professor
Brett K. Levay-Young, M2
Timothy D. SIELAFF, SM
Karen R. Wasiluk, SM

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The general surgery program trains medical doctors for the practice of surgery and for academic positions. See the Medical School for professional degree requirements; see below for academic degree requirements. Trainees spend two to three years in laboratory research, either in a basic science or in surgery, after which they begin their senior residency and chief residency training. The Medical School’s laboratory departments offer many graduate courses closely related to surgery (see the graduate programs in biochemistry, molecular biology and biophysics; cellular and integrative physiology; microbiology, immunology, and molecular pathology; and pharmacology).

These fields also offer opportunities for research work. The Department of Surgery offers supervised work in its experimental research laboratories, as well as in its hospital and outpatient departments, in the areas of surgical diagnosis and operative surgery and in some surgical specialties (such as colon and rectal surgery, transplantation, thoracic and cardiovascular surgery, and pediatric surgery).

Prerequisites for Admission—Prospective students must be in the general surgery training program and have 2-3 clinical years of training completed.

Courses—Please refer to Surgery (Surg) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx courses is not permitted toward degree requirements.

M.S. Surg. Plan A Degree Requirements
The M.S.Surg. is offered Plan A only. Students spend two to three years in the Medical School’s general surgery program. A minimum of 53 course credits (47 in the major plus 6 in the minor or related fields) plus 10 thesis credits are required for a total of 63 credits.

Final Exam—The final exam is oral.

Language Requirements—None.

Ph.D. Surg. Degree Requirements
Students spend two to three years in the Medical School’s general surgery program. A minimum of 79 course credits (67 in the major plus 12 to 16 in the minor or supporting program) is required; 24 thesis credits are also required.

Language Requirements—None.

Sustainable Agriculture Systems

Minor Only

Contact Information—Director of Graduate Studies, Sustainable Agriculture Systems Minor, Minnesota Institute for Sustainable Agriculture, University of Minnesota, 411 Borlaug Hall, 1991 Upper Buford Circle, St. Paul, MN 55108 (612-625-8235; fax 612-625-1268; jorda020@umn.edu; www.misa.umn.edu).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
Deborah L. Allan, Soil, Water, and Climate, M
David A. Andow, Entomology, M
David D. Biesboer, Plant Biology, M
Vernon B. Cardwell, Agronomy and Plant Genetics, M
Iris D. Charvat, Plant Biology, M
Sharon M. Danes, Family Social Science, M
Peter H. Graham, Soil, Water, and Climate, M
Jeffrey Lynn Gunsolus, Agronomy and Plant Genetics, M
Emily E. Hoover, Horticultural Science, M
Nicholas R. Jordan, Agronomy and Plant Genetics, M
Robert Philip King, Applied Economics, M
Albert H. Markhart III, Horticultural Science, M
Roger D. Moon, Entomology, M
Kent D. Olson, Applied Economics, M
James H. Orf, Agronomy and Plant Genetics, M
Edward B. Radcliffe, Entomology, M
Paul C. Rosenblatt, Family Social Science, M
Michael P. Russelle, Soil, Water, and Climate, M
Craig C. Sheaffer, Agronomy and Plant Genetics, M
John M. Shutske, Biosystems and Agricultural Engineering, M
Steve R. Simmons, Agronomy and Plant Genetics, M
William F. Wilcke, Biosystems and Agricultural Engineering, M
Donald Wyse, Agronomy and Plant Genetics, M

Associate Professor
John Deen, Clinical and Population Science, M
Ruth Dill-Macky, M
Susan M. Galatowitsch, Horticultural Science, M
Jeffrey H. Gillman, Horticultural Science, M
Craig A. Hassel, Food Science and Nutrition, M
Paul Porter, Agronomy and Plant Genetics, M
Marla Spivak, Entomology, M

Assistant Professor
Helene Murray, Agronomy and Plant Genetics, M
Kristen C. Nelson, Forest Resources, M
Chery Smith, Food Science and Nutrition, M

Curriculum—The minor in sustainable agriculture systems offers master’s (M.A. and M.S.) and doctoral students an interdisciplinary curriculum that considers the biological, sociological, and economic aspects of agriculture. The minor emphasizes a holistic perspective to designing farming and food systems and solving problems in agriculture. The importance of yield and profitability are balanced by considerations of the environment and the health and social well-being of producers, consumers, and communities. The minor complements major programs in ecology, conservation biology, forestry, sociology, geography, political science, and public affairs, as well as majors in the College of Agricultural, Food and Environmental Sciences.

Prerequisites for Admission—Admission is contingent upon prior admission to a master’s or doctoral degree-granting program within the Graduate School.

Special Application Requirements—Contact the director of graduate studies in sustainable agriculture systems for an Intent to Enroll form. Students are admitted each semester.

Courses—Please refer to Sustainable Agriculture Systems (SAg) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—4xxx courses are permitted toward minor requirements based on director of graduate studies approval.
Minor Only Requirements
The master’s minor requires 6 graduate credits from the core curriculum; the doctoral minor requires 12 graduate credits. All students must take SAg 8101 and 8201. The other core course is Agro 5321—Ecology of Agricultural Systems (cross listed with Ent 5321). A unique component of the minor is an on-site internship with growers, grassroots organizations, or public agencies working in sustainable agriculture.

Theatre Arts
Contact Information—Department of Theatre Arts and Dance, University of Minnesota, 580 Rarig Center, 330 21st Avenue S., Minneapolis, MN 55455 (612-625-3029; fax 612-625-6334; theatre@umn.edu [http://cla.umn.edu/theatre]).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
C. Lance Brockman, M2
Michal Kobiakła, SM

Associate Professor
Louis R. Bellamy, M2
Ananya Chatterjea, M2
Carl L. Flink, M2
Martin B. Gwinup, M2
Sonja Arsham Kufshine, M2
Mathew J. LeFebvre, M2
Margaret L. Maddux, M2
Jean A. Montgomery, M2
Elizabet H. Nash, M2
Joan A. Smith, M2

Assistant Professor
Bransilav Jakoljevic, M2
Margaret L. Werry, M2
Aleksandra Wolska, M2

Education Specialist
Susan M. Binder, M
Brent “Mickey” Henry, M
Michael J. Sommers, AM
Sherry L. Wagner-Henry, M

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—Theatre arts programs provide practical and theoretical education for the performer, artist, educator, scholar, and audience member. Training the historian, theorist, artist, and crafts person is linked to and centered in the laboratory experience of live performance as well as in the academic classroom. The programs serve the dual roles of examining the various historical and contextual relationships of past and present theatre while educating audiences and theatre artisans/educators of tomorrow. The programs prepare students for careers in professional or academic theatre and related artistic fields.

Prerequisites for Admission—Students are admitted for fall semester only. The M.A./Ph.D. program and the M.F.A. design/technology program admit every year. The M.F.A. directing program admits every three years. Prerequisites for the initial screening phase of admission include a U.S. bachelor’s degree or comparable foreign degree from a recognized college or university, a minimum of 18 undergraduate credits or the equivalent in theatre arts, and a 3.00 GPA. Applicants for all degree programs must submit scores from the GRE by February 1. International students’ TOEFL scores must be submitted by January 15 (a paper score of 550 is preferred for acceptance or 213 on the computer test).

The master’s degree is a prerequisite for admission to the Ph.D. program. Students without a master’s degree are admitted to the Ph.D. with the intention that the M.A. will be attained in route to the Ph.D. For admission to the M.A./Ph.D. or Ph.D. program, students must have a working knowledge/reading proficiency of at least one foreign language (or a sign language). A computer language will not satisfy this requirement.

Special Application Requirements—The application deadline for all degree programs is January 15. Applications received after that date will be considered only if there is an opening in the particular program. M.A./Ph.D. students wishing to have materials reviewed for the Graduate School Fellowship (for support of first-year students) must have materials submitted by January 5. All programs require a current résumé, statement of purpose/intent, and three letters of recommendation to accompany the departmental application.

The M.F.A. directing program requires an audition by invitation in Minneapolis in early March after an initial screening of application files. The directing program does not interview with U/RTA. (See note regarding this degree under Degree Requirements.)

The M.F.A. design and technology program requires a portfolio review either through the Chicago U/RTA or by submitting materials to be received by February 1. The program also interviews by pre-arrangement during the annual USITT conference.

The M.A./Ph.D. program requires a submitted sample of research writing.

Courses—Please refer to Theatre Arts (Th) and Dance (Dnce) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Inclusion of 4xxx theatre and dance courses on graduate degree program forms is subject to approval by the director of graduate studies. Such courses must be taught by a member of the graduate faculty. Students from other programs may include these courses with their own program’s approval.

M.A. Degree Requirements
The M.A. degree emphasizes academic pursuits and is considered a prerequisite for the Ph.D. The areas of study for the M.A./Ph.D. are theatre historiography, design and technical production, and directing (including management). Any of these may serve as a concentration of study, although the Ph.D. ordinarily focuses on the first. Candidates must complete coursework in both academic and performance areas.

For both Plan A and B, 30 credits are required from the following: three of the six sequence courses (8111-8116) plus 8102, totaling 12 credits; 3 credits from a course in performance conventions; 3 credits in independent seminar; 6 elective credits from inside or outside the department; 6 credits at the graduate level from outside the department (outside courses must be at least 3 credits each). For Plan A, 10 additional thesis credits (Th 8777) and an oral defense of the thesis are required. For Plan B, three papers are required.

Language Requirements—See the requirements for the Ph.D.

Final Exam—For Plan A, the final exam is written and oral. For Plan B, the final exam is written; an oral exam typically is not required, but one may be requested by the M.A. committee.

Minor Requirements for Students Majoring in Other Fields—A master’s minor requires a minimum of 9 credits as approved by the director of graduate studies.

M.F.A. Degree Requirements
The three-year, performance-oriented M.F.A. degree offers two areas of specialization: directing, and design and technical production. The M.F.A. in directing focuses on developing intellectual and artistic skills and leadership talent through an intensive course of study with an emphasis on performance. (Note: at the time of this catalog printing, the M.F.A. in directing degree program is under revision. Please contact the department for further details.) For the M.F.A. in design and technology, all areas of design are studied in order to increase understanding in specialization areas, and technology is studied as an essential part of design. Students are expected to achieve proficiency in at least two areas of any combination of design and technology (scenery/properties, costuming, lighting, sound) and a level of expertise in at least one of these areas. Program faculty will work with students to identify the final areas for the degree. The M.F.A. degree is considered a terminal degree in these areas of theatre arts.

The M.F.A. requires 60 graduate credits, although a particular program’s requirements may exceed this minimum. The degree requires 6 credits of dramatic literature or theatre history, which may be fulfilled by Th 4177 and 4178; and a minimum of 6 credits from outside
the department (at least 3 credits of which must be a University course that contributes substantially to the degree program). Each program requires a final performance practice and written record of it. For specific program requirements, contact the director of graduate studies.

Language Requirements—None.

Final Exam—Students must take a final oral exam related to the final creative project and must submit a written record of the project and the research related to it.

Ph.D. Degree Requirements

The Ph.D. certifies that a degree recipient has a knowledge and understanding of theatre historiography and practice as well as pedagogical and professional strategies for communicating and applying that knowledge. The areas of study for the M.A./Ph.D. are theatre historiography, design and technical production, and directing (including management). Any of these may serve as a concentration of study, although the Ph.D. ordinarily focuses on the first. Candidates must complete coursework in both academic and performance areas.

The core curriculum, designed to help students finish the program within five years, consists of two parts: part I—coursework (three years); and part II—research and dissertation writing. The three years of coursework are tailored so that the first two years are structured, and the third year is more open, allowing students to pursue their individual areas of interest in more depth. Students are required to successfully complete six required courses over the three-year sequence: three courses must be in specific areas of theatre historiography, to be chosen from six seminars (Th 8111-6 sequence); historiography (Th 8102); a course in performance conventions; and an independent seminar in which students refine and materialize their work. This seminar, which can take the form of an independent research study, directed reading/production, or a regular course format designed by the student and the adviser, usually takes place at the beginning of the third year. Students must also take coursework in a supporting program of a minor (12 credits); and 24 thesis credits, for a minimum total of 54 credits beyond the B.A. Topics courses and seminars supplement the core curriculum. Students must demonstrate a research technique appropriate to the thesis. This could take the form of a foreign language or a discipline research methodology which might increase the total number of credits required for the degree.

Language Requirements—Ph.D. students are expected to demonstrate proficiency in at least one foreign language as certified by the adviser or program faculty in the language.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires a minimum of 12 credits as approved by the director of graduate studies.

Theriogenology

See Veterinary Medicine.

Toxicology

Contact Information—Luanne Petcoff, Office Specialist, Toxicology Graduate Program, Medical School Duluth, 236 SMed, 1035 University Drive, Duluth, MN 55812 (218-726-8892; fax 218-726-8014; toxgrad@d.umn.edu)

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.aspx

Professor

Yusuf J. Abul-Hajj, Medicinal Chemistry, Pharmacognosy, SM
David R. Brown, Veterinary and Biomedical Sciences, SM
Robert M. Carlson, Chemistry, Duluth, SM
Lester R. Drewes, Biochemistry, Duluth, SM
Vincent F. Garry, Laboratory Medicine and Pathology, SM
Patrick E. Hanna, Medicinal Chemistry, Pharmacognosy, SM
Michael J. Murphy, Veterinary Population Medicine, SM
Herbert T. Nagasawa, Medicinal Chemistry, Pharmacognosy, SM
Gerald J. Niemi, NRR1 Duluth, SM
Joseph R. Prohaska, Biochemistry, Duluth, SM
Jean F. L. Regal, Pharmacology, Duluth, SM
W. Thomas Shier, Medicinal Chemistry, Pharmacognosy, SM
Sheldon B. Sparber, Pharmacology, SM
Lawrence P. Wackett, Biochemistry, SM
Kendall B. Wallace, Biochemistry, Duluth, SM

Adjunct Professor

Subhash C. Basak, NRR1 Duluth, AM2
John L. Butenhoff, 3M, AM2
Glenn G. Hardin, Veterinary Diagnostic Medicine, AM2
Herve N. Lebrec, Veterinary Diagnostic Medicine, AM2
John W. Nichols, Duluth, AM2
Robert R. Roy, 3M, AM2
Robert S. Skoglund, 3M, AM2

Associate Professor

Gerald T. Anklery, Environmental Protection Agency, Duluth, AM2
Anthony Kiorpes, MGI Pharma Inc., SM
Lisa A. Peterson, School of Public Health, SM
Mark S. Rutherford, Veterinary and Biomedical Sciences, SM
Asish K. Singh, Veterinary Population Medicine, SM

Assistant Professor

Robert P. Cormier, Biochemistry, Duluth, SM
Yinduo Ji, Veterinary and Biomedical Sciences, SM
Geary Olson, 3M, AM2
Glen G. Hardin, Veterinary Diagnostic Medicine, SM

Adjunct Assistant Professor

Hillary Carpenter, Minnesota Department of Health
David Chandler, 3M
Larry Johnson, 3M

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—This University-wide program provides comprehensive training in the broad scope of toxicology. Toxicology, the science of poisons, is devoted to identifying and characterizing the risk associated with exposures to potential noxious agents in our environment. Although most chemical agents at sufficiently large doses may be toxic, not all present a significant risk to human health, environmental organisms, or ecosystems. Accordingly, the essence of the science of toxicology is defining the line that distinguishes a risk from a residue. This requires scientific expertise in analytical and environmental chemistry, biology, and mathematics. Advanced courses and research are also available in subdisciplines such as human health risk assessment; epidemiology; environmental chemistry and engineering; ecotoxicology; food additives and nutritional toxicology; biochemical and physiological mechanisms; molecular toxicology and toxicogenomics; histopathology; diagnostic and analytical toxicology; drug metabolism; chemical carcinogenesis and reproductive toxicology; behavioral toxicology; veterinary toxicology; and the toxicity of noxious agents to various organ systems (e.g., nervous, heart, liver, kidneys).

Prerequisites for Admission—A B.S. in basic science is required. All applicants should have completed a full year of biology, chemistry, and physics, and have completed mathematics through calculus.

Special Application Requirements—Applicants must submit scores from the General (Apartment) Test of the GRE, three letters of recommendation from college-level faculty or equivalent persons who are familiar with the applicant’s scholarship and research potential, a complete set of official transcripts, and a clearly written statement of career interests, goals, and objectives. The application deadline is February 1.

Courses—Please refer to Toxicology (Txcl) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of 4xxx courses toward degree requirements is permitted with director of graduate studies’ approval.

M.S. Degree Requirements

The M.S. is offered under plan A and Plan B. Plan A requires 20 course credits and 10 thesis credits. Plan B requires 30 course credits. A core curriculum of 8 credits in toxicology (Txcl 8012, 8013 and 8100) is required for both plans. Additional courses are arranged on an individual basis.

Language Requirements—None.

Final Exam—The final exam is written and oral.
Ph.D. Degree Requirements
The Ph.D. requires core courses in physiology, biochemistry, statistics, and toxicology. Students must also complete 12 credits in a minor or supporting program and 24 thesis credits. Because the program spans the Duluth and Twin Cities campuses, the required course numbers differ on each campus.

Additional advanced courses in toxicology or related fields may be specified by the adviser. Students must complete and defend an original research project.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires 12 credits: 8 credits of core courses and 4 credits of advanced toxicology courses.

Transportation Studies

Postbaccalaureate Certificate

Contact Information—Transportation Studies Certificate, Information Center, College of Continuing Education, University of Minnesota, 77 Pleasant Street SE, Minneapolis, MN 55455 (612-624-4000; fax 612-625-6381; info@cee.umn.edu; cts@umn.edu; www.cts.umn.edu).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
John Adams, Geography, M
Gary Davis, Civil Engineering, M

Associate Professor
Karen Donohue, Operations and Management Sciences, M
David Levinson, Civil Engineering, M
Gerard McCullough, Applied Economics, M

Assistant Professor
Kevin Krizek, Public Affairs, M

Curriculum—The transportation studies program allows students to gain advanced interdisciplinary knowledge of transportation by taking a set of core courses along with a series of focused electives. The certificate program is structured into three program tracks to meet the core course requirement including: 1) civil engineering, 2) planning/public policy, and 3) supply chain management. Students select a minimum of two courses from two different program tracks. Students are also required to complete a one-credit intelligent transportation technology seminar as a part of their core coursework. In addition to this foundation, students acquire further expertise in a specific area related to transportation by taking at least 9 graduate credits in a field chosen by the student and approved by the director of graduate studies. These credits may consist of any combination of courses that will further the student’s knowledge of a specific transportation-related subject area or areas. A broad array of topical areas and course offerings are available including advanced traffic engineering and related mathematical disciplines; transportation pavements or structures; management, logistics, regional planning, or human factors; historical, political, or economic analysis.

Prerequisites for Admission—Admission requires a B.S. or B.A. from an accredited U.S. institution or its foreign counterpart. The degree must be in a field related to transportation. Applicants who hold a degree in an unrelated field must demonstrate familiarity with the transportation-related issues through work experience, community involvement, political leadership, or other activity.

A preferred performance level for your undergraduate GPA of 3.00. (If you do not meet the preferred performance level of 3.00 GPA, your application should describe relevant nonacademic experience as well as explain any other relevant factors for the Graduate School’s and program faculty’s consideration.)

Study in any one or more of the following technical course topics, demonstrating proficiency in physical science and/or quantitative analysis: intermediate economics, theory, statistics, calculus, physics. Note: One year of successful undergraduate study (with at least a 3.00 or “B” grade) in any combination of the above or other related topics. The GRE is not required.

Special Application Requirements—Prospective students must submit a statement explaining how their work experience, community involvement, political leadership, or other activity has prepared them for the program. Prospective students may supplement this statement with letters of recommendation from employers, community leaders, etc., if appropriate.

Courses—The core courses are structured into three program tracks. Civil engineering track: CE 5211, CE 5214; planning/public policy track: PA 8202, PA 5202/Geog5372, CE 5212; supply chain management track: Mktd 6060, OMS 6056, OMS 6072. Students select a minimum of two core courses from two different program tracks.

Students are also required to complete ME 8772/CE 8213, a one-credit intelligent transportation technology seminar, as a part of their core coursework. Elective courses consist of any combination of courses in a transportation-related subject area. The courses must be approved by the director of graduate studies. For more information on courses, please visit www.cts.umn.edu/certificate/index.html.

Use of 4xxx Courses—Use of 4xxx Courses toward requirements is subject to director of graduate studies approval.

Postbaccalaureate Certificate Requirements
Completion of two of the eight core courses along with the Transportation Technology Seminar, three or more cognate elective courses chosen by the student in consultation with the director of graduate studies, and at least 16 graduate level credits are required.

Urban and Regional Planning

Contact Information—Director of Admissions, Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, 301 19th Avenue South, Minneapolis, MN 55455 (612-624-3800; fax 612-626-0002; admissions@hhh.umn.edu). www.hhh.umn.edu.

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Regents Professor
G. Edward Schuh, M2

Professor
Dean E. Abrahamson (emeritus), AM2
John S. Adams, M2
Ragui A. Assaad, M2
J. Brian Atwood, M2
Michael Barnett, M2
Richard S. Bolan (emeritus), AM2
John E. Brandl, M2
John M. Bryson, M2
Nancy N. Eustis, M2
Katherine Fennelly, M2
Edward G. Goetz, M2
Stephen A. Hoenack, M2
C. David Hollister, AM2
Anne R. D. Kapuscinski, Fisheries, Wildlife, and Conservation Biology, AM
Kenneth H. Keller, M2
Sally J. Kenney, M2
Morris M. Kleiner, M2
Robert T. Kudrle, M2
Ann R. Markussen, M2
Samuel L. Myers, M2
David G. Pitt, Landscape Architecture, AM2
Carlisle F. Runge, Applied Economics, AM

Associate Professor
Barbara Crosby, M2
Maria J. Hanratty, M2
David M. Levinson, Civil Engineering, AM2
Deborah Levison, M2
Joseph A. Ritter, M2
Jodi R. Sandfort, M2
Melissa M. Stone, M2

Assistant Professor
William Craig, Geography, AM
Kevin J. Krizek, M2
Aijun Nie, M2
Carissa Schively, M2
Use of 4xxx Courses

Use of 4xxx courses toward degree requirements is permitted with instructor’s and adviser’s permission.

M.U.R.P. Degree Requirements

The M.U.R.P., which is offered under coursework only and Plan A, requires 48 credits including core courses (26 credits), specialization electives (9 credits), and 10 credits of electives. Each student completes an internship in a public or private planning agency usually during the summer after the first year of the program. All students also take a capstone workshop (3 credits) that constitutes a final professional-level project. Students in the Coursework Only option complete a professional paper. Students selecting the Plan A option register for 10 thesis credits and complete a thesis. Specializations for the degree include housing and community development; regional, economic, and workforce development; transportation planning; land use/urban design planning; and environmental planning. Students may pursue a minor.

Language Requirements—None.

Final Exam—The final exam is oral for Plan A. The client presentation in the Capstone workshop fulfills the requirement for the final exam for Coursework Only.

Veterinary Medicine

Contact Information—Director of Graduate Studies, Veterinary Medicine Graduate Program, College of Veterinary Medicine, 443 VMC, 1365 Gortner Ave., St. Paul, MN 55108 (612-624-7413; fax 612-625-4734; medgrad@umn.edu; www.cvm.umn.edu; ResearchandGradProg/GradPrograms

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor

Trevor R. Ames, Veterinary Population Medicine, SM
P. Jane Armstrong, Veterinary Clinical Sciences, SM
Russell F. Bey, Veterinary and Biomedical Sciences, SM
David R. Brown, Veterinary and Biomedical Sciences, SM
Cathy S. Carlson, Veterinary Population Medicine, SM
James E. Collins, Veterinary Population Medicine, SM
Peter Davies, Veterinary Population Medicine, SM
Scott A. Dee, Veterinary Population Medicine, SM
John Deen, Veterinary Population Medicine, SM
Melyna L. Fahning, Veterinary Population Medicine, SM
Daniel A. Feeney, Veterinary Clinical Sciences, SM
John Fetrow, Veterinary Population Medicine, SM
Douglass N. Foster, Animal Science, ASM
Sandra M. Godden, Veterinary Population Medicine, SM
Sagar M. Goyal, Veterinary Population Medicine, SM
David A. Halvorson, Veterinary and Biomedical Sciences, SM
Robert M. Hardy, Veterinary Clinical Sciences, M2
David W. Hayden, Veterinary Population Medicine, SM
William D. Hueston, Veterinary Population Medicine, SM
Richard Isaacson, Veterinary and Biomedical Sciences, SM
Carl R. Jessen, Veterinary Clinical Sciences, M2
Han S. Joo, Veterinary Population Medicine, SM
Mathur S. Kannan, Veterinary and Biomedical Sciences, SM
Vivek Kapur, Microbiology, SM
Jeffrey P. Klausner, Veterinary Clinical Sciences, SM
Jody P. Lulich, Veterinary Clinical Sciences, SM
Samuel K. Maheshwaran, Veterinary and Biomedical Sciences, SM
Thomas W. Molitor, Veterinary Population Medicine, SM
Roger D. Moon, Entomology, ASM
Robert B. Morrison, Veterinary Population Medicine, SM
Michael P. Murtaugh, Veterinary and Biomedical Sciences, SM
Kakambi V. Nagaraja, Veterinary and Biomedical Sciences, SM
Timothy D. O’Brien, Veterinary Population Medicine, SM
Carl A. Osborne, Veterinary Clinical Sciences, SM
Phillip K. Peterson, Medicine, AM2
Carlos Pijoan, Veterinary Population Medicine, SM
David J. Polzin, Veterinary Clinical Sciences, SM
Michael Pullen, Veterinary Population Medicine, M1
Patrick T. Redig, Veterinary Clinical Sciences, M2
Bradley E. Seguin II, Veterinary Population Medicine, SM
Jagdev M. Sharma, Veterinary and Biomedical Sciences, SM
Bert E. Stromberg, Veterinary and Biomedical Sciences, SM
Tracy A. Turner, Veterinary Population Medicine, SM
Stephanie J. Valberg, Veterinary Population Medicine, SM
Larry J. Wallace, Veterinary Clinical Sciences, SM
Robert Washabau, Veterinary Clinical Sciences, SM
Douglas J. Weiss, Veterinary and Biomedical Sciences, SM
Jonathan E. Wheaton, Animal Science, ASM

Clinical Professor

Betty A. Heffernan, Veterinary Clinical Sciences, M2

Associate Professor

Kay S. Faaberg, Veterinary and Biomedical Sciences, M2
James R. Lokensgard, Medicine, AM2
Moses K. Njenga, Veterinary and Biomedical Sciences, M2
Elaine P. Rude, Veterinary Clinical Sciences, SM
Mark S. Rutherford, Veterinary and Biomedical Sciences, SM
Abby M. Sage, Veterinary Population Medicine, M2
Degree Programs and Faculty

Leslie Sharkey, Veterinary Population Medicine, M2
Srinand Sreevatsan, Veterinary Population Medicine, SM
Anthony Tobias, Veterinary Clinical Sciences, SM
Ava M. Trent, Veterinary Population Medicine, M2
Scott J. Wells, Veterinary Population Medicine, SM

Associate Clinical Professor
Lynelle Graham, Veterinary Clinical Sciences, M2
Erin D. Malone, Veterinary Population Medicine, M2
Paul Rapnicki, Veterinary Population Medicine, M2
Margaret V. Root Kustritz, Veterinary Clinical Sciences, M2
Kurt D. Rossow, Veterinary Population Medicine, SM

Assistant Professor
Jeff B. Bender, Veterinary Population Medicine, SM
Dori L. Borjesson, Veterinary Population Medicine, M2
Connie J. Gebhart, Veterinary and Biomedical Sciences, SM
Yinduo Ji, Veterinary and Biomedical Sciences, M2
Elizabeth McNeil, Veterinary Clinical Sciences, M2
Petra A. Mertens, Veterinary Population Medicine, M2
Douglas Plager, Dermatology, AM2
Elizabeth Pluhar, Veterinary Clinical Sciences, SM
Kenneth P. Roberts, Urologic Surgery, AM2
Randall Singer, Veterinary and Biomedical Sciences, SM
Sheila M. F. Torres, Veterinary Clinical Sciences, SM

Assistant Clinical Professor
Roberto Novo, Veterinary Clinical Sciences, M2
Jane E. Quandt, Veterinary Clinical Sciences, M2

Instructor
Montserrat Torremorell, Veterinary Population Medicine, AM2

Research Associate
Shirin Munir, Microbiology, M

The program emphasizes quality clinical training with state-of-the-art research in areas of animal disease at the individual and population levels. All species of domestic animals are the subject of both teaching and research, the program being particularly strong in population-based medicine and epidemiology. Other areas of strength include canine and feline urology, radiology, pain, molecular epidemiology in food animals, microbiology, and immunology.

Prerequisites for Admission—The majority of applicants have a DVM. degree or its equivalent. Applicants lacking a DVM. degree, including those currently enrolled in a DVM. degree program, may be accepted upon approval by the program advisory committee.

Special Application Requirements—Applicants must submit a clearly written statement outlining their career interests and goals, any previous research experience, and identifying the specialty track desired. Also required are a complete set of official transcripts, a CV or résumé, and three letters of recommendation from individuals knowledgeable about the applicant’s academic performance. Applicants are requested but not required to take the GRE prior to consideration for admission. Students may apply at any time; however, submission of all application materials by January 1 is strongly encouraged to ensure priority consideration for fellowships and research assistantships awarded for the next academic year. Students are typically admitted for fall semester, though spring semester admission is also available.

Research Facilities—Research facilities available to the veterinary medicine graduate student include the Advanced Genetic Analysis Center, the Clinical Investigation Center, the Raptor Center, the Swine Center, the Swine Disease Eradication Center, and the Avian Disease Research Center.

Courses—Please refer to Veterinary Medicine (VMed) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—Use of selected 4xxx courses to meet degree requirements is acceptable with prior approval from the adviser and director of graduate studies.

M.S. Degree Requirements
The M.S. is offered under Plan A and Plan B. Plan A requires 20 credits; a minimum of 14 credits in the major, 6 credits in a minor or related field, and in 10 thesis credits. Plan B requires 30 course credits; 14 credits in the major and 16 credits in a minor or related field, chosen in consultation with the adviser. Three papers are also required (e.g., a case report, a research project, and a literature review).

Language Requirements—None.

Final Exam—The final exam is written and oral.

Minor Requirements for Students Majoring in Other Fields—A master’s minor requires 6 course credits taken from recommended courses in the veterinary medicine major.

Ph.D. Degree Requirements
There are no minimum requirements but students usually take 24 to 30 credits in the major field and 12 credits minimum for official minor or supporting program. In addition, 24 thesis credits are required.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires 12 course credits taken from recommended courses in the veterinary medicine major.

Vocational Education
See Work, Community, and Family Education.

Water Resources Science

Contact Information—Director of Graduate Studies-Twin Cities, Water Resources Science, University of Minnesota, 173 McNeal Hall, 1985 Buford Avenue, St. Paul, MN 55108 (612-624-9282; fax 612-625-1263; wrs@umn.edu); and Associate Director of Graduate Studies-Duluth, Water Resources Science, 213 RLB, University of Minnesota, Duluth, MN 55812 (218-726-8891; fax 218-726-6979).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
E. Calvin Alexander, Jr., Earth Science Geology/Geophysics, SM
Dorothy Anderson, Forest Resources, SM
James L. Anderson, Soil, Water, and Climate, SM
Roger E. A. Arndt, Civil Engineering, SM
Marvin Bauer, Forest Resources, SM
James C. Bell, Soil, Water, and Climate, SM
David D. Biesboer, Plant Biology, SM
Paul R. Bloom, Soil, Water, and Climate, SM
Patrick L. Brezonik, Civil Engineering, SM
Kenneth N. Brooks, Forest Resources, SM
Charles J. Clanton, Biosystems and Agricultural Engineering, SM
Steve M. Colman, Geological Sciences, Duluth, SM
K. William Easter, Applied Economics, SM
Ehsan Eroz, Accounting, Duluth, AM2
Leonard C. Ferrington, Entomology, SM
Efí Fofoula, Civil Engineering, SM
Philip J. Gersmehl, Geography, SM
Florence K. Gleason, Plant Biology, SM
Sagar M. Goyal, Veterinary Diagnostic Medicine, SM
John S. Gulliver, Civil Engineering, SM
Satish C. Gupta, Soil, Water, and Climate, SM
Emi Ito, Earth Science Geology/Geophysics, SM
Randall Hicks, Biology, Duluth, SM
Thomas C. Johnson, Geological Sciences, Duluth, SM
Andrew R. Klemmer, Biology, Duluth, SM
Assistant Professor
Donn Bransatrator, Biology, Duluth, SM
Jacques Finlay, Ecology, Evolution, and Behavior, M2
Christina Gallup, Geological Sciences, Duluth SM
Thomas Hrabik, Biology, Duluth, M2
Jennifer King, Soil, Water, and Climate, M2
Timothy LaPara, Civil Engineering, SM
Joseph McFadden, Ecology, Evolution and Behavior, M2
Kristopher McNeill, Chemistry, SM
Kristen Nelso, Forest Resources, SM
Matt Simcik, Environmental and Occupational Health, SM
John Swenson, Geological Sciences, Duluth, M2
Josef Werne, Chemistry, Duluth, M2

Adjunct Assistant Professor
James Almendinger, Fisheries, Wildlife, and Conservation Biology, AM2
David Fulton, Fisheries, Wildlife, and Conservation Biology, SM
Tyson Ochsner, Soil, Water, and Climate, AM2
Pamela Rice, Soil, Water, and Climate, AM2
Edward Swain, Fisheries, Wildlife, and Conservation Biology, AM2

Senior Research Associate
Richard Axler, Natural Resources Research Institute, Duluth, SM
George Host, Natural Resources Research Institute, Duluth, SM
Lucinda Johnson, Natural Resources Research Institute, Duluth, M2

Research Associate
Prasanna Gowda, Soil, Water, and Climate, SM
Euan Reavie, Natural Resources Research Institute, Duluth, M2
Ingrid Schneider, Forest Resources, SM

Senior Fellow
Lawrence Baker, Water Resources Center, SM

Other
Lorin Hatch, Macalaster College, AM2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—This cross-campus interdisciplinary program provides comprehensive training in water resources science, with integration across scientific disciplines. A structured interdisciplinary graduate curriculum is offered. The program includes a set of core courses plus electives in the following areas of emphasis at the M.S. and Ph.D. levels: aquatic biology, environmental chemistry, hydrologic science, limnology, water management technology, water policy, water quality, and watershed science and management. Approximately 80 courses offered within 15 other graduate programs are available to students majoring in water resources science.

The goal of the program is to produce scientists with strong technical skills in disciplines relevant to water resources and a broad understanding of 1) the hydrologic cycle and associated ecosystems, 2) the interconnectedness of the sciences involved in managing aquatic resources, and 3) the interplay between the biophysical sciences and social sciences in developing and implementing public policies related to water.

The program involves faculty from the following departments on the Twin Cities campus: Applied Economics; Biosystems and Agricultural Engineering; Civil Engineering; Ecology, Evolution, and Behavior; Entomology; Environmental and Occupational Health; Fisheries, Wildlife, and Conservation Biology; Forest Resources; Geography; Horticultural Science; Earth Science Geology/Geophysics; Microbiology, Plant Biology; Soil, Water, and Climate; and the Humphrey Institute of Public Affairs. It also involves faculty from the following departments on the Duluth campus: Biology, Chemical Engineering, Chemistry, Geophysics, Geological Sciences, Physics, and Political Science, as well as the Large Lakes Observatory and the Natural Resources Research Institute in Duluth.

Prerequisites for Admission —The program is flexible enough to accommodate students from a variety of backgrounds. Normally students have a bachelor’s degree in physical or biological science or engineering.

Recommended academic preparation includes one year (or two semesters) each of calculus, physics, and chemistry and one biology course. Further preparation may be expected from students wishing to specialize in certain areas of the program. Students who do not have a master’s degree in a related subject are admitted to the M.S. program first, even if their long-term goal is a Ph.D. degree. Availability of funding and willingness of a member of the graduate faculty to serve as an advisor are important criteria for admission to the Ph.D. program.

Special Application Requirements— Applicants must submit three letters of recommendation to the director of graduate studies. These letters should be from professors qualified to estimate applicant’s class rank and evaluate their ability to complete a program of graduate study, or from persons who can assess their professional or research potential. These letters also may be used in applying for financial aid.

Applicants must also submit a résumé of their academic history and professional experience and a statement of purpose, including the proposed area of emphasis. Applicants should submit results of the GRE; only rarely, under extenuating circumstances, will students be considered for admission without GRE scores. Applicants are strongly encouraged to submit results of the GRE. Those who have not taken the GRE are at a disadvantage in competing for financial aid. Students may be admitted any semester but are strongly encouraged to begin fall semester and to submit their application by January 1 in the year they expect to begin their studies.
Courses—Please refer to Water Resources Science (WRS) in the course section of this catalog for courses pertaining to the program. Check the program Web site at http://wrs.coafes.umn.edu for additional course information.

Use of 4xxx Courses—Use of 4xxx courses is permitted for degree requirements based on approval by the advisor and the director of graduate studies.

M.S. Degree Requirements

Students may choose Plan A, which requires a thesis, or Plan B, which requires additional coursework and a major project. Both plans incorporate courses offered on the Twin Cities and Duluth campuses.

Students must complete courses in four core areas: 1) hydrology (surface and/or hydrogeology); 2) environmental/water chemistry; 3) limnology; and 4) water resources policy, economics, and management, and two electives in such areas of emphasis as aquatic biology, hydrologic science, watershed science and management, and water management technology. One elective must be from an approved list of technical courses dealing with water quality science/management. A minimum of two supporting courses (at least 6 credits) outside of aquatic science also are required. Training in responsible conduct of research and ethics is also required. Approved core and area of emphasis courses are listed on the program Web site at http://wrs.coafes.umn.edu.

A minimum of 20 course credits (plus 10 thesis credits) are required for Plan A and a minimum of 30 credits are required for Plan B (up to 3 credits may be used for the Plan B project). Students who had classes equivalent to those in the WRS core as undergraduates may substitute other classes to meet the Graduate School minimum requirement of 20 credits.

Language Requirements—None.

Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—A master’s minor requires 9 credits, including WRS 5101 (3 credits) or in Duluth POL 4201 (4 credits) and two of the other core courses described under M.S. degree requirements.

Ph.D. Degree Requirements

Coursework is tailored to student interests, and many areas of emphasis are possible. Core courses are offered on both the Twin Cities and Duluth campuses.

Students complete coursework equivalent to that of an M.S. in water resources science, with additional coursework in an area of emphasis. There are no specific credit requirements in the major, but Ph.D. programs normally include at least 40 course credits beyond the B.S. level, including relevant coursework taken for a master’s degree and a required minimum of 12 credits in a minor or supporting program.

Language Requirements—None.

Minor Requirements for Students Majoring in Other Fields—Doctoral students must complete 12 credits, including WRS 5101 (3 credits) or in Duluth POL 4201 (4 credits), a core courses described under the M.S. degree requirements, and two electives from one of the areas of emphasis.

Wildlife Conservation

Contact Information—Wildlife Conservation, College of Natural Resources, University of Minnesota, 135 Skok Hall, 2003 Upper Buford Circle, St. Paul, MN 55108-6146 (612-624-0734; fax 612-624-6282; wildlife@umn.edu; www.fw.umn.edu). For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor

Yosef Cohen, SM
Francesca J. Cuthbert, SM
Ralph J. Gutiérrez, SM
Donald B. Sniff, Ecology, Evolution, and Behavior, SM
J. L. David Smith, SM
Anthony M. Starfield, Ecology, Evolution, and Behavior, SM

Adjunct Professor

David E. Andersen, SM
L. David Mech, SM

Associate Professor

Robert B. Blair, SM
Kristen C. Nelson, SM
John P. Loegering, M2

Adjunct Associate Professor

Glenn D. DelGiudice, SM
David C. Fulton, SM
David L. Garshelis, SM
Richard O. Kimmel, M

Assistant Professor

Todd Arnold AM

Adjunct Assistant Professor

Alan Franklin, M2

Ph.D. Degree Requirements

Plan A is recommended; Plan B is available under special circumstances. Students must become familiar with factors underlying wildlife population and habitat ecology, management techniques, and how management agencies function. Academic work includes coursework in animal ecology, wildlife management, and statistics. The Plan A thesis should involve at least one field season, but generally two. Plan B students complete one to three projects involving field, laboratory, or planning work.

Language Requirements—None.

Final Exam—The final exam is oral.

Minor Requirements for Students Majoring in Other Fields—A master’s minor requires a minimum of 6 credits as approved by the director of graduate studies.
Ph.D. Degree Requirements

Degree programs include basic wildlife biology, development of analytical skills, and one or more areas of specialization.

Language Requirements—A foreign language is required only when the advisory committee determines that a language is needed to support the student’s research objectives.

Minor Requirements for Students Majoring in Other Fields—A doctoral minor requires a minimum of 12 credits as approved by the director of graduate studies.

Work, Community, and Family Education

Contact Information—Professor Jim Brown, Director of Graduate Studies, Department of Work, Community, and Family Education, University of Minnesota, 210 Vocational and Technical Education Building, 1954 Buford Avenue, St. Paul, MN 55108 (612-624-1221; fax 612-624-2231; bce@umn.edu; www.education.umn.edu/wcf).

For up-to-date graduate faculty listings, see www.grad.umn.edu/faculty_rosters/step1.asp.

Professor
Thomas Brothen, General College, AM
James M. Brown, SM
Terence George Collins, General College, AM
Jeanne Louise Higbee, General College, AM
Judith J. Lambrecht, SM
Theodore Lewis, SM
Gary N. McLean, SM
Roland L. Peterson, SM
David J. Pucel, SM
Richard A. Swanson, SM

Adjunct Professor
Richard A. Krueger, Extension, SM

Associate Professor
Laura Coffin Koch, General College, AM
Rosemarie J. Park, SM
Thomas Joseph Reynolds, General College, AM
James R. Stone III, SM
Cathrine A. Wambach, General College, AM
Baiyin Yang, SM

Assistant Professor
Kenneth R. Bartlett, SM
Brad Greiman, M2
Richard M. Joerger, M2
Shari L. Peterson, SM

Lecturer
John R. Vreyens, International Agricultural Programs, AM2

Other
Barry Craig Johansen, Rochester, AM2
Tom Peacock, Education, Duluth, AM2

Along with the program-specific requirements listed below, please read the General Information section of this catalog for Graduate School requirements that apply to all major fields.

Curriculum—The Ed.D. offers specializations in adult education; agriculture, food, and environmental education; business and industry education; human resource development; and comprehensive work, community, and family education. Students combine study and related experiences to develop, apply, analyze, synthesize, and evaluate knowledge of the purposes, practices, issues, and problems of work and community education; social, economic, historical, political, cultural, educational, technological, and psychological contexts within which work and community education exist; and types of research that contribute to or apply that knowledge to the specialization.

See also Education—Work, Community, and Family Education for information about the M.A. and Ph.D. degrees.

Prerequisites for Admission—Prospective master’s degree students generally have completed an undergraduate degree or extensive coursework in the specialization area. Prospective doctoral degree students should have academic background and experience in at least one specialization area.

Special Application Requirements—Scores from the GRE general test are required for applicants with a bachelor’s degree from a U.S. institution. Applicants should designate the specific specialization to which they seek admission in their goal statement. A current résumé is required. Students are admitted each term.

Courses—Please refer to Adult Education (AdEd), Agricultural, Food, and Environmental Education (AFEE), Business and Industry Education (BIE), Human Resource Development (HRD), and Work, Community, and Family Education (WCFE) in the course section of this catalog for courses pertaining to the program.

Use of 4xxx Courses—A maximum of 15 credits from 4xxx courses may be used in the supporting program. Students are responsible for determining that the course was available for graduate credit and the offering department criteria for graduate credit were satisfied. Degree programs must include rationale for the use of 4xxx course credits.

Ed.D. Degree Requirements

The Ed.D. requires 60 course credits and 24 field study credits (thesis credits). Course credits include a minimum of 12 credits in general aspects, a minimum of 11 credits in research, and a minimum of 28 credits in the specialization, 4 of which must be internship credits. Course credits must also include 12 credits from outside the department, which may overlap with those in general aspects, research, and the specialization.
Related Fields
Graduate degree programs do not exist in the following fields. However, students may earn graduate credit in courses related to their program and use faculty members on their examining committees from these fields. For graduate courses, see the Courses section in this catalog.

Chicano Studies
Associate Professor
Guillermo Rojas, E

Neurosurgery
Professor
Walter A. Hall, E
Walter C. Low, E
Robert E. Maxwell, E
Gaylan L. Rockswold, E

Pediatrics
Regents Professor
Alfred F. Michael, E
James G. White, E
Professor
David M. Brown, E
Carlyle C. Clawson, E
Patricia Ferrieri, E
Edward L. Kaplan, Epidemiology, E
James H. Moller, E
Harvey Sharp, E
Warren J. Warwick, E
Associate Professor
Amos S. Deinard, E
Assistant Professor
Pi-Nian Chang, E
Elizabeth E. Giles, E

Psychiatry (AdPy and CAPy)
Professor
Gerald J. August, E
Marilyn E. Carroll, E
Scott J. Crow, E
Elke D. Eckert, E
William H. Frey, Pharmacy, E
Judith G. Garrard, Health Services Research, Policy and Administration, E
Dorothy Hatsukami, Epidemiology, E
Jerome L. Kroll, E
Thomas B. Mackenzie, E
Michael K. Popkin, E
Associate Professor
Michael L. Bloomquist, E
Carrie M. Borchardt, E
George Realmuto, E
Assistant Professor
Daniel R. Hanson, E

Therapeutic Radiology
Professor
John J. Kersey, Pediatrics, E
Faiz M. Khan, E
Chang W. Song, E
Associate Professor
Bruce J. Gerbi, E
Patrick D. Higgins, E
Assistant Professor
Parham Alaei, E