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South Dakota State University

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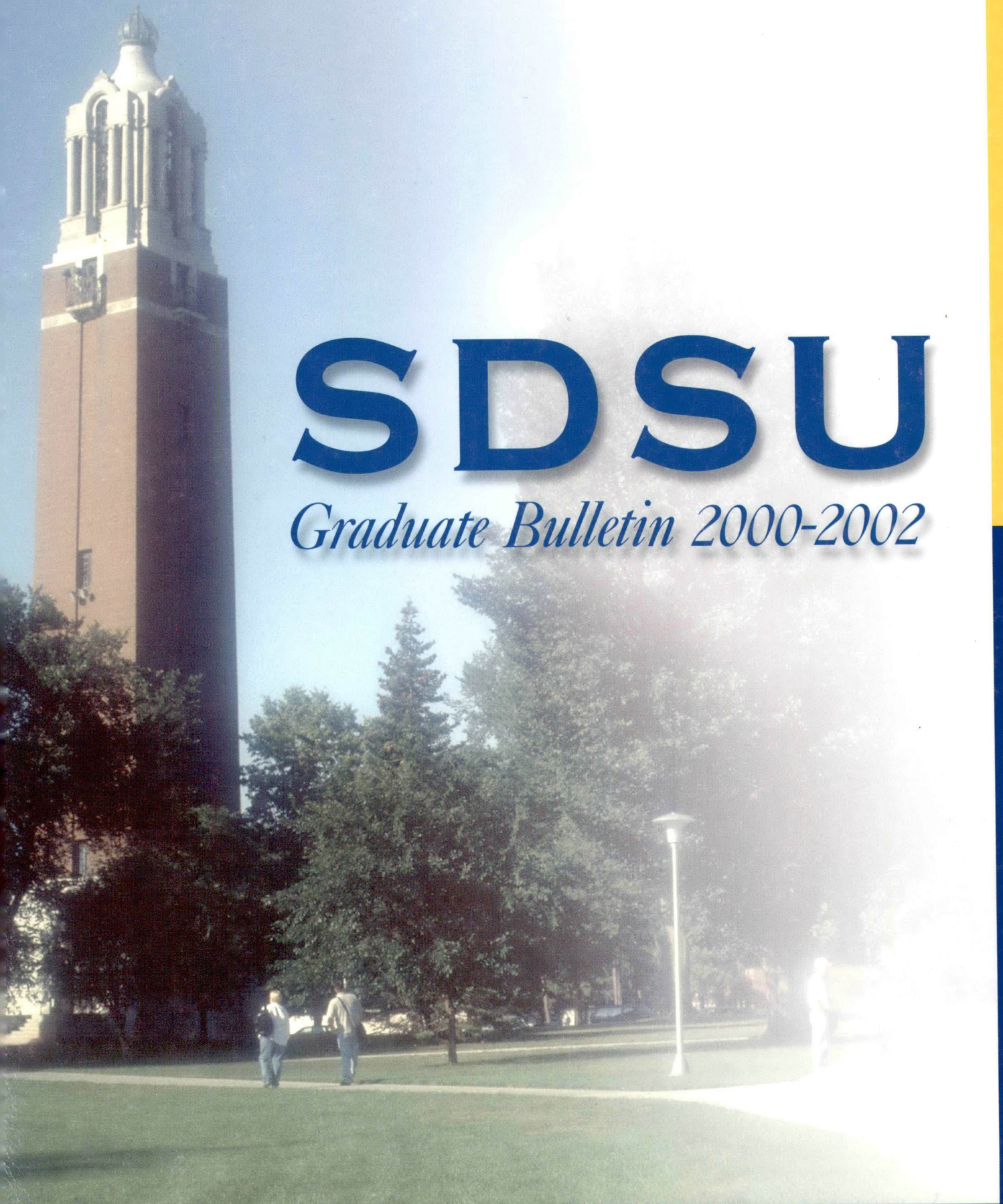
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South Dakota State University Bulletin

SDSU

Graduate Bulletin 2000-2002



ACADEMIC CALENDAR

2000 FALL TERM

(1 day registration, 69 class days, 5 exam days)

September 4, MondayLabor Day Holiday
September 5, TuesdayRegistration and Orientation
September 6, WednesdayInstruction begins
September 14, ThursdayLast day to drop or add
and adjust final fees
September 22, FridayLast day to submit a
graduation application for Fall 2000
October 7, SaturdayHobo Day
October 9, MondayNative American Day Holiday
October 18, Wednesday“W” grade begins
October 25, WednesdayFirst half Fall Term ends
October 30, MondayDeficiency reports due in
Registrar’s Office, Adm 208, by 5:00 p.m.
November 10, FridayVeterans Day Holiday
November 15, WednesdayLast day to drop a course
November 23, 24, Thursday-FridayThanksgiving Recess
December 15, FridayLast day of classes, Fall 2000
December 16, SaturdayGraduation, 10:00 a.m.
December 18-22, Monday - TuesdayFinal examinations
December 28, ThursdayGrades due in Registrar’s Office
not later than 5:00 p.m.

2001 SPRING TERM

(1 day registration, 73 class days, 5 exam days)

January 10, WednesdayRegistration and Orientation
January 11, ThursdayInstruction begins
January 15, MondayMartin Luther King, Jr. Day Holiday
January 22, MondayLast day to drop or add
adjust final fees
February 7, WednesdayLast day to submit a
graduation application for Spring 2001
February 19, MondayPresidents’ Day Holiday
February 26, Monday“W” grade begins
March 5-9, Monday-FridaySpring Break
March 13, TuesdayFirst half Spring Semester ends
March 16, FridayDeficiency reports due in
Registrar’s Office, Adm 208, by 5:00 p.m.
April 2, MondayLast day to drop a course
April 13, 16, Friday-MondayEaster Recess
May 4, FridayLast day of classes, Spring 2001
May 5, Saturday115th Annual Commencement, 10:00 a.m.
May 7-11, Monday-FridayFinal examinations
May 16, WednesdayGrades due in Registrar’s Office
not later than 5:00 p.m.

2001 SUMMER TERM

May 14 , (Monday) - June 8 (Friday)Session 1
May 28, MondayMemorial Day Holiday
June 11, (Monday) - July 6 (Friday)Session 2
July 4, WednesdayIndependence Day Holiday
July 9, (Monday) - August 3 (Friday)Session 3
August 6, (Monday) - August 31 (Friday)Session 4

2001 FALL TERM

(1 day registration, 69 class days, 5 exam days)

September 3, MondayLabor Day Holiday
September 4, TuesdayRegistration and Orientation
September 5, WednesdayInstruction begins
September 13, ThursdayLast day to drop or add
and adjust final fees
September 21, FridayLast day to submit a
graduation application for Fall 2001
October 8, MondayNative American Day Holiday
October 13, SaturdayHobo Day
October 17, Wednesday“W” grade begins
October 24, WednesdayFirst half Fall Term ends
October 29, MondayDeficiency reports due in
Registrar’s Office, Adm 208, by 5:00 p.m.
November 12, WednesdayVeterans Day Holiday
November 14, WednesdayLast day to drop a course
November 22, 23, Thursday-FridayThanksgiving Recess
December 14, FridayLast day of classes, Fall 2001
December 15, SaturdayGraduation, 10:00 a.m.
December 15, WednesdayReading Day
December 17-21, Monday-FridayFinal examinations
December 27, ThursdayGrades due in Registrar’s Office
not later than 5:00 p.m.

2002 SPRING TERM

(1 day registration, 73 class days, 5 exam days)

January 9, WednesdayRegistration and Orientation
January 10, ThursdayInstruction begins
January 18, FridayLast day to drop or add
adjust final fees
January 21, MondayMartin Luther King, Jr. Day Holiday
February 6, WednesdayLast day to submit a
graduation application for Spring 2002
February 18, MondayPresidents’ Day Holiday
February 25, Monday“W” grade begins
March 5, WednesdayFirst half Spring Term ends
March 8, FridayDeficiency reports due in
Registrar’s Office, Adm 208, by 5:00 p.m.
March 11-15, Monday-FridaySpring Break
March 29, April 1, Friday, MondayEaster Recess
April 3, WednesdayLast day to drop a course
May 3, FridayLast day of classes, Spring 2002
May 4, Saturday116th Annual Commencement, 10:00 a.m.
May 6-10, Monday-FridayFinal examinations
May 15, WednesdayGrades due in Registrar’s Office
not later than 5:00 p.m.

2002 SUMMER TERM

May 13, (Monday) - June 7 (Friday)Session 1
May 27, MondayMemorial Day Holiday
June 10, (Monday) - July 5 (Friday)Session 2
July 4, ThursdayIndependence Day Holiday
July 8, (Monday) - August 2 (Friday)Session 3
August 5, (Monday) - August 30 (Friday)Session 4



SOUTH DAKOTA STATE UNIVERSITY

GRADUATE BULLETIN 2000-2002

www.sdstate.edu/grad_school

South Dakota State University Bulletin Quarterly (USPS 474-180)

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ultimately the student's responsibility to stay abreast of current regulations, curricula, and the status of specific programs being offered. Furthermore, the university reserves the right, as approved by the Board of Regents, to modify requirements, curricula offerings, and charges, and to add, alter, or delete courses and programs through appropriate procedures. While reasonable efforts will be made to publicize such changes, a student is encouraged to seek current information from appropriate offices. Web Site: <http://www.sdstate.edu>.

Address from the Dean

Welcome to South Dakota State University's Graduate School



Thank you for considering graduate school at South Dakota State University. Individuals have many different reasons for pursuing graduate level education. These include a desire to broaden your knowledge base, the need to obtain the credentials necessary to assume or maintain a leadership role in your professional career, and personal fulfillment. Whether you are motivated by one of these or by other factors, SDSU will provide a high quality educational experience in a wide range of disciplines in M.S., M.A., M.Ed. and Ph.D. programs for degree-seeking students as well as individual classes for those enrolled as special (non-degree) students.

South Dakota State University's approximately 300 graduate faculty provide graduate education in 30 majors in agriculture, engineering, humanities, health sciences, education, natural sciences and social sciences. Depending upon your major, you may conduct research that expands the boundaries of knowledge or follow a non-thesis option. In either case, your plan of study will be carefully developed to prepare you to live, work and contribute in the 21st century.

This Graduate Bulletin is your best source of information about our programs and the guidelines and procedures associated with admissions, degree requirements and graduation procedures. You are encouraged to keep it as a reference throughout your graduate career at SDSU. Information is also available on-line. General information about SDSU can be obtained by connecting to the University's homepage at: www.sdstate.edu. Information more specific to the graduate school can be reached at: www.sdstate.edu/grad_school or by clicking on "academics" on the University's homepage.

South Dakota State University is located in Brookings, South Dakota, a very friendly town of about 17,000. You can learn more about Brookings by checking the website: www.brookings.com.

I invite you to contact us by telephone at 605/688-4181, or to visit our campus and your prospective department. I assure you that you will find many interesting and challenging opportunities as a part of your graduate education at SDSU!

David C. Hilderbrand
Dean of Graduate School, Research and Sponsored Programs

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South Dakota State University Non-Discrimination Policy

It is the policy of South Dakota State University (SDSU) **not** to discriminate on the basis of race, color, creed, religion, national origin, ancestry, citizenship, age, gender, sexual orientation, disability, or Vietnam Era Veteran status in the offering of all benefits, services, and education and employment opportunities.

Discrimination complaints on the basis of sex, including sexual harassment complaints, should be directed to the Title IX Coordinator: Dr. Marcus Dahn, SDSU Director for Diversity Enhancement, ADM 217, Phone: 605/688-6361.

Discrimination complaints on the basis of disability should be directed to the Section 504/ADA Coordinator: Mr. Eugene T. Butler, Jr., ADM 318, Phone: 605/688-4493 (TTY 605/688-4394).

Discrimination complaints based on other protected categories should be directed to Dr. Marcus Dahn, Director for Diversity Enhancement, ADM 217, Phone: 605/688-6361.

Board and Council Members, Administration

— Board of Regents —

- Honorable Robert T. (Tad) Perry
Pierre
Executive Director
- Honorable David Gienapp
Madison
Term expires March 31, 2003
- Honorable James Hansen
Pierre
Term expires March 31, 2001
- Honorable Harvey C. Jewett, IV
Aberdeen
Term expires March 31, 2003
- Honorable Curt Jones
Britton
Term expires March 31, 2003
- Honorable Pat Lebrun
Rapid City
Term expires March 31, 1999
- Honorable Rudolph Nef
Milbank
Term expires March 31, 2004
- Honorable Shane C. Penfield
Student Regent
Vermillion
Term expires July 1, 2000
- Honorable Jack Rentschler
Sioux Falls
Term expires March 31, 2003

— Graduate Council —

- David C. HilderbrandChair; Dean of Graduate School; Professor of Chemistry
- Roger K. SandnessProfessor and Head of Geography
Term expires 2001
- Charles G. ScaletProfessor and Head of Wildlife and Fisheries Sciences
Term expires 2001
- Bonny L. Specker.....Director and Professor of Ethel Austin Martin-
Edward Moss Martin Chair of Human Nutrition
Term expires 2001
- Ruth HarperAssociate Professor of Counseling and Human Resource Development
Term expires 2002
- Robert J. LacherProfessor of Mathematics and Statistics
Term expires 2002
- Diane Holland RickerlProfessor of Plant Science
Term expires 2002
- Mary R. RyderProfessor of English
Term expires 2003
- Robert G. FinchProfessor of Electrical Engineering
Term expires 2003
- Douglas C. McFarlandProfessor of Animal and Range Sciences
Term expires 2003
- John J. RuffoloAssociate Dean of Graduate School/Office of Research
Professor of Biology and Microbiology
Ex-officio
- Steve R. Marquardt.....Dean of Libraries; Professor of Library Science
Ex-officio

— SDSU Administration —

- Peggy Gordon ElliottPresident
Ed.D., Indiana University, 1975 *Professor of Education*
- Carol J. PetersonVice President for Academic Affairs
Ph.D., University of Minnesota-Minneapolis/St. Paul, 1969 *Professor of Nursing*
- Michael P. RegerVice President for Administration
Ph.D., The Ohio State University, 1983 *Assistant Professor of Education*
- Edward P. HoganAssociate Vice President for Academic Affairs and
Chief Information Technology Officer
Ph.D., Saint Louis University, 1969 *Professor of Geography*

— College Deans —

- David C. HilderbrandDean, Graduate School; Director of Research and Sponsored Programs
Ph.D., University of Missouri, 1971 *Professor of Chemistry*
- Fred A. CholickDean, College of Agriculture and Biological Sciences
Ph.D., Colorado State University, 1977 *Professor of Plant Science*
- Jerry D. Jorgensen.....Dean, College of Arts and Science
Ph.D., University of Nebraska, 1990 *Professor of Communication Studies and Theatre*
- Dee HopkinsDean, College of Education and Counseling
Ed.D., Indiana University, 1982 *Professor of Education*
- Virgil G. Ellerbruch.....Dean, College of Engineering
Ph.D., University of Wyoming, 1969 *Professor of Electrical Engineering*
- Aelred KurtenbachExternal Dean, College of Engineering
Ph.D., Purdue University, 1968
- Laurie Stenberg NicholsDean, College of Family and Consumer Sciences
Ph.D., The Ohio State University, 1988 *Professor of Human Development, Consumer and Family Sciences*
- Gail Dobbs TidemannDean, College of General Registration
Ph.D., University of Alabama, 1978 *Professor of Human Development, Consumer and Family Sciences*
- Roberta OlsonDean, College of Nursing
Ph.D., Saint Louis University, 1984 *Professor of Nursing*
- Danny LattinDean, College of Pharmacy
Ph.D., University of Minnesota, 1970 *Professor of Medicinal Chemistry*

General Information

An act of the Territorial Legislature approved in 1881 provided for the establishment of what is now South Dakota State University. The institution granted its first Master of Science degree in 1891, its first Master of Education degree and Doctor of Philosophy degree in 1958. All graduate work was supervised by a committee until 1957, when the Graduate School was established.

A **Graduate Council** of nine members elected from the Graduate Faculty assists the Graduate Dean. The council includes the Graduate Dean (chair); one member each from Animal Sciences, Biological Sciences, Education and Counseling, Engineering Sciences, Health Sciences, Physical Sciences, Plant Sciences, Social Sciences and Humanities. The Dean of the Library serves as an ex-officio member.

The **Graduate Faculty** is composed of the University President, Vice President for Academic Affairs, Vice President for Administrative Affairs, college deans, heads of departments in which graduate courses are given, and other faculty, chosen on the basis of their training and experience, in accordance with the policies of the Graduate School. All matters of policy and standards are acted on by the Graduate Faculty. In addition, Graduate Faculty are authorized to serve as advisor to graduate students or on their examining committee and to teach courses for graduate credit.

The **Graduate School** provides an atmosphere for qualified students to obtain rigorous advanced education in a variety of fields in preparation for service and leadership in their professions and society. It also promotes scholarly pursuits and scientific research for the advancement of knowledge within a climate of freedom of inquiry.

This Bulletin deals only with the graduate programs of the institution. For material on undergraduate programs and for general information concerning South Dakota State University, refer to the General Catalog (Undergraduate Bulletin), available in the Admissions Office, Administration Building (ADM) 200.

This Bulletin is printed to provide information about the graduate programs of South Dakota State University. Every effort has been made to provide as complete and accurate information as possible; however, it should be noted that changes may occur at any time. Students are allowed to fulfill the degree requirements in effect at the time of initial enrollment as a degree-seeking student, provided the student completes the degree requirements within the stated time frame through continuous enrollment. If a student needs to re-apply into the degree program, the guidelines in effect at the time of re-application must then be followed. It is the student's responsibility to become familiar with and complete the requirements for the degree being sought.

South Dakota State University is a land-grant university and as such subscribes to the land-grant philosophy of education, research, and extension as its three-fold mission. The Graduate School is a separate administrative unit composed of selected scholars within the University.

Listed below are the SDSU areas noting the **accreditation boards**:

SDSU Graduate Programs through the Doctoral Degree —
North Central Association of Colleges and Secondary Schools, the regional accrediting agency for 19 states including South Dakota

Agricultural, Civil, Electrical, and Mechanical Engineering Departments —

Engineers Council for Professional Development

Journalism Curriculum —
American Council on Education for Journalism

College of Nursing —
National League for Nursing

Chemistry Department —
American Chemical Society

Preparation of secondary teachers, administrators and guidance counselors at the graduate level —
National Council for Accreditation of Teacher Education

Memberships include:

SDSU Graduate School —
Council of Graduate Schools in the United States and the Midwestern Association of Graduate Schools

University —
American Council on Education, National Association of State Universities and Land-Grant Colleges

Other —
*American Society for Engineering Education
The Association of Accredited Schools and Departments of Journalism
American Library Association
The National Commission on Accrediting Agencies*

Admission Information

Graduate Degrees Offered

Doctor of Philosophy

- *Agricultural Engineering*
(in cooperation with Iowa State University)
- *Agronomy*
- *Animal Science*
Animal Science
Dairy Science
- *Atmospheric, Environmental and Water Resources*
- *Biological Sciences,*
Animal and Range Sciences
Biology and Microbiology
Dairy Science
Plant Science
Veterinary Science
Wildlife and Fisheries Sciences
- *Chemistry*
- *Sociology*

Master of Arts

- *English*

Master of Education

- *Curriculum and Instruction*
- *Educational Administration*

Master of Science

- *Animal Sciences*
Animal and Range Sciences
Dairy Science
Veterinary Science
- *Biological Sciences*
Biology and Microbiology
Dairy Manufacturing
Food and Biomaterial Processing
Horticulture
Human Nutrition and Food Science
Pharmaceutical Science
Veterinary Science
- *Chemistry*
- *Communication Studies and Journalism*
- *Counseling and Human Resource Development*
- *Economics*
- *Engineering*
Agricultural Engineering
Civil Engineering
Computer Science
Electrical Engineering
Mechanical Engineering
Physics
- *Family and Consumer Sciences*
Human Development,
Consumer and Family Sciences
Nutrition and Food Sciences
- *Geography*
- *Health, Physical Education and Recreation*
- *Industrial Management*
- *Mathematics*
- *Nursing*
- *Plant Science*
Horticulture
Plant Science
- *Rural Sociology*
- *Wildlife and Fisheries*
Fisheries Option
Wildlife Option

Admission to Graduate School

Students must be admitted to the Graduate School before enrolling in any graduate course, whether or not they are pursuing an advanced degree. A completed application must be filed with the Graduate School at least one month before the beginning of the first term of graduate work. Students applying for Special Student (non-degree) status must also complete an application and be admitted to Graduate School. **NOTE:** Being admitted to the Graduate School does not admit a student to a degree program.

Admission Requirements

Baccalaureate Degree — Admission to the Graduate School requires that the applicant be a graduate of an institution of higher learning. The institution must be one of recognized standing (regional accreditation) whose requirements are substantially the same as those of the South Dakota State University department(s) in which the advanced degree will be taken.

Graduate Record Examination (GRE) — Submission of the results of a Graduate Record Examination is not a Graduate School requirement. However, the following programs require that scores be submitted: Agronomy; Biology; Electrical Engineering; English; Entomology; Health, Physical Education and Recreation; Microbiology; Plant Pathology, and Wildlife and Fisheries. For information about the GRE test, contact the department concerned or the Academic Evaluation and Assessment Office, Pugsley Continuing Education Center, Room 201.

Department Requirements — Individual departments may have additional admission requirements. Applicants should inquire about such requirements from the department of interest.

Application Procedure

Application Form — A completed form supplied by the Graduate School must be submitted and accompanied by a non-refundable application fee of \$15. An application form can be found at the back of this Bulletin.

Official Transcripts — For degree-seeking students, official transcripts of all undergraduate and graduate course work must be sent directly to the Graduate School. For those students not actively pursuing a graduate degree, the Bachelor's degree must be stated on the application form and the degree will be verified. Students will be withdrawn from graduate coursework if a degree cannot be verified.

If the application is submitted before the Bachelor's degree is complete, an incomplete transcript must be filed. When the Bachelor's degree is awarded, a final transcript must then be sent. This final transcript must be filed during the first semester of graduate work.

International students who cannot provide original transcripts may submit notarized or certified copies at the time of application. A Provisional degree will be accepted.

Letters of Recommendation — Two letters of recommendation from persons acquainted with the academic ability and professional competence of the applicant should be sent directly to the Graduate School. Forms are available with the application packet as well as in the back of this Bulletin. This requirement may be waived by the Dean of the Graduate School on recommendation of the department.

Application Procedure for International Students

In addition to the above procedures, International Students must also submit the following:

TOEFL Score — A score of 525 or above is required by the Graduate School for the Test of English as a Foreign Language (TOEFL). This score pertains to paper-based test score reports. Department requirements are listed with each department section in this bulletin. Additional English testing is given after arrival, and students who do not possess satisfactory language skills may be required to enroll in remedial courses. Remedial courses may not be used toward a graduate degree and require separate tuition payment.

Financial Support — Evidence of available financial support for at least two years (M.S., M.A., M.Ed.) or four years (Ph.D.) must be submitted to the International Student Affairs (ISA) Office, ADM 312. For any financial assistance from this institution, the applicant should correspond with the Head of the Major Department.

Physical Examination Record — A physical evaluation is helpful. A record of 2 (two) immunizations for measles and 2 (two) for rubella, signed by a doctor, is required.

Documents for entry into the U.S. will be issued by the International Student Affairs Office after academic admission and financial certification are complete.

Application Process

After an application for admission and all supporting documents are received and evaluated by the Graduate School, they are sent for review to the department concerned. Using the recommendations made by the department, the Dean of the Graduate School acts on the application and notifies the applicant, department, and/or committee concerned.

Admission Status

Unconditional Admission

An applicant may be admitted without condition if a Bachelor's degree has been earned, all undergraduate prerequisites for major and minor (if required) fields of study satisfactorily completed, and the applicant had an average of "B" (3.0 or higher on a 4-point grading system; A = 4, B = 3, C = 2, D = 1) during the last two academic years of undergraduate work.

Applicants with grade point average between 3.0 and 2.75 may also be considered for unconditional admission if other aspects of their academic and/or professional record indicate superior performance and potential.

Admission to all degree programs is competitive and limited by the availability of personnel, facilities, and funding necessary to provide quality graduate education within each program.

Conditional Admission

Conditional admission may be granted if:

- 1) The applicant meets the requirements for unconditional admission for the last three semesters but has not completed the last semester of undergraduate study. Admission is conditional until the Bachelor's degree is granted, **OR**
- 2) The applicant lacks prerequisite undergraduate courses specified by the major department. Admission is conditional until these courses have been completed to the satisfaction of the department and these courses cannot be used on the graduate Plan of Study, **OR**
- 3) The applicant has a grade point average between 2.5 and 3.0 for the junior and senior years.

Students admitted conditionally with a cumulative or junior/senior grade point average of less than 2.75 must complete a minimum of 10 graduate credits with grades of B or above before becoming eligible for a graduate assistantship.

Course Numbering System

300-499 series — Advanced undergraduate courses which may be used in meeting part of the requirements for graduate degrees in accordance with the policy on converted credit, page 9.

These courses are not listed in this bulletin, but are listed in the General Catalog (Undergraduate Bulletin).

NOTE: When credits in the 300-499 series are applied to a graduate program, they are entered on the transcript without notation. It is doubtful, therefore, that they could be transferred as graduate credit to another institution.

500-599 series — Entry level graduate courses (may be dual listed with a 400 level undergraduate course and may include limited enrollment by undergraduates). See below.

600-699 series — Graduate level courses.

These courses are open to SDSU senior students for graduate credit if they meet the following requirements:

1. Within 15 credits of completing a Bachelor's degree;
2. Have an overall grade point average of 2.5 or higher, or a Junior-Senior grade point average of 3.0 or higher;
3. Enroll for no more than 18 credits, undergraduate and graduate credits combined (9 credits during Summer Term).
4. The course(s) cannot be required, or included, for the Bachelor's degree.
5. A signed permit is required.

These courses are approved as graduate credit and undergraduate students must meet the same level of performance as graduate students.

700-799 series — Graduate level courses open only to graduate students.

800-899 series — Doctoral and post-doctoral level courses open only to doctoral students or those holding an earned doctoral degree.

Experimental Courses — Courses at the 500-800 levels ending in 98 or 99 are experimental and may be active for two years from the date of the first offering, at which time they end or must become permanent courses.

A student admitted conditionally must satisfy any conditions within the first year after admission. Departments will assign advisors to such students. Failure of a student to fulfill the above conditions or to do satisfactory graduate work at any point in his/her program is sufficient grounds for dismissal or reclassification as a Special (non-degree) Student.

Students with a junior-senior grade point average above 2.75 and who have pass-fail (or equivalent) grades shall have instructors for such courses furnish letter grades or shall furnish satisfactory Graduate Record Examination (GRE) scores.

Special Student (non-degree)

Students not meeting the above admission requirements, those initially enrolled only in evening classes, and those not working toward a degree may be granted admission and take courses as Special Students. Special Students may not receive Graduate Assistantships, financial aid, or enroll for thesis/dissertation credits. The Graduate Dean will act as advisor for these students unless they are assigned to a department advisor. No more than ten credits under Special Student status may be applied toward a degree.

Change of Admission Status

Students with Special Student status may request and be granted a change in status to work toward a degree, provided ten credits of graduate work have been completed with a cumulative GPA of 3.0 or better. The request must include complete official transcripts and application fee if these have not been supplied previously. This request must be submitted to the Graduate School by the student or advisor, after which it will be submitted to the appropriate department for a recommendation and processed as other applications.

Readmission

Students formerly enrolled as graduate students at South Dakota State University (who interrupt continuous registration) should apply for readmission at least one month prior to registration. Forms for this purpose can be obtained from the Graduate School. Official transcripts for graduate work taken at other institutions since last enrollment at South Dakota State University must be furnished.

Graduate School rules and regulations in effect at the time of readmission apply to students who are readmitted. The Graduate School or graduate program may require applicants for readmission to update their application file or to complete a new application including current references if required by the program. Students who are readmitted may be required to change their advisory committee and file a new Plan of Study.

A personal interview with the head of the major department should be arranged prior to registration as a readmitted student.

Student Responsibility

Before a degree is granted, the student must meet all the requirements of the Advisory Committee, the Major Department and the Graduate School. Students should note that graduate studies represent advanced work and research in a discipline or interdisciplinary area and should be more than a compilation of course work. Students are responsible for conforming to all published academic policies and degree requirements. They are likewise responsible for the regulations concerning the degree they plan to obtain and any special requirements within the department or academic unit. In addition, it is the student's responsibility to conform to the University's policies regarding the standard of work necessary to maintain enrollment in the Graduate School.

Graduate Academic Standards

Graduate students are expected to maintain at least a "B" average (3.0) in all courses in the graduate plan of study. Students who encounter academic difficulty will be warned by the Graduate School and may be discontinued in their degree program or from the university when academic standards are not maintained. Pharmacy students at the graduate level of the Doctor of Pharmacy program must maintain academic standards of progression as determined by the College of Pharmacy.

Converted Credits

Courses numbered 300-499 are considered to be advanced undergraduate credits. These credits, may be used in graduate programs with the following provisions:

- a. When applied to a graduate program, total credit for these courses will be valued at 80 percent, discarding all fractions.

After such conversion, these credits are defined as "converted credits," which may be used as graduate credit in meeting the requirements for the various degrees, provided a grade of at least "B" is obtained in each course in this series. For example, if eight credits are earned in this series, they would be equivalent to six graduate credits.

- b. Courses used for converted credit must be SDSU credits and taken during the period the student is enrolled as a graduate student at this institution. These must be entered on the graduate transcript to be eligible for converted credit.
- c. For the Master of Arts, Master of Science or Master of Education degrees, a maximum of seven converted credits may be applied to the graduate program. They may be applied in the major, minor, or supporting course areas.
- d. For the Doctor of Philosophy degree, a maximum of ten converted credits may be applied to the graduate program. They may be applied in the major, minor, or supporting course areas, if applicable.
- e. Converted credits may be applied to a graduate program only with the permission of the major advisor or Advisory Committee and Dean of the Graduate School.

Course Restrictions for Master's and Doctoral Plans of Study

Correspondence Courses — Correspondence courses are not given at the graduate level at this institution and are not permitted on a student's Plan of Study. Generally courses delivered by television are considered to be correspondence courses, with the exception of two-way interactive television offered by this institution.

Problems Courses — A maximum of four credits in problems courses (Special Problems, independent study, etc.) may be counted toward the Master of Arts, Master of Science, or Master of Education degree. A maximum of six credits of problems courses (beyond the Bachelor's degree) may be counted toward the Doctor of Philosophy degree.

Transfer of Credits — Graduate credits earned while in residence at other institutions may be applied toward an advanced degree if they were awarded a grade of at least "B" (3.0), and if they are approved by the Advisor or Advisory Committee and the Dean of the Graduate School. Transfer credit is limited to Graduate credit as defined by the institution issuing the transcript. Dual-numbered courses offered primarily for upper-level undergraduate credit are (generally) not transferrable as graduate credit. Transfer credits cannot substitute for credits required for minimum residence (see Residence and Credit Requirements). Requests for transfer of credits are usually made at the time a Plan of Study is approved and must be supported by an official transcript filed with the Graduate School. For the Master's degree, transfer credits are limited to a maximum of 40% of the credits in the program.

Transfer credit is not permitted for courses taken by correspondence. Independent Study, Readings', or Problems courses, Continuing Education, Outreach Programs, or Extension courses may be approved for transfer if they are regularly listed in the graduate bulletin (catalog) of an accredited institution and were taught by members of the Graduate Faculty of such institution. Subtitles or explanatory information will be required for approval of Independent Study and Readings' courses. Transfer credit is usually not permitted for work from foreign institutions.

Workshops — While any number of credits may be earned in workshops, a maximum of two such credits may be applied toward an advanced degree. Workshop notation on transcripts will be used for application of this limitation.

Internet Courses — SDSU will consider accepting the transfer of graduate credit for graduate courses delivered and taken over the Internet on the same basis as other transfer courses. The course must be from an accredited institution as recognized by the Board of Regents policy. If credits are to be applied to an accredited SDSU program, the program in which the course was taken at another institution must also be accredited.

Credit Loads

Credits Needed for Full-Time/Part-Time Status, not including graduate assistants:

	<i>Minimum Credits</i>	<i>Maximum credits without overload</i>
Full-Time MS, Fall/Spring semesters	9	12
Full-Time PhD, Fall/Spring semesters	7	12
Half-Time MS/PhD, Fall/Spring semesters.....	4.5	
Full-Time, Summer Term, 4-week session	3.5	5
Full-Time, Summer Term, 8-week session	6	9

Maximum credits **graduate assistants** may carry:

	<i>Academic Year</i>	<i>Summer Term</i>
One-fourth (1/4) time assistant	30	5
One-half (1/2) time assistant	22	3
Three-fourths (3/4) time assistant	15	3

In calculating credit loads, audit courses and undergraduate courses are included at full value for Graduate School but are not allowable for loan deferral, full- and part-time certification, or financial aids disbursement. Graduate assistants must be registered for at least one credit each semester during the academic year to hold a graduate assistantship. For financial aid requirements of a full load, contact the Financial Aid Office.

In general, courses will not be offered to fewer than 7 students for graduate courses, unless there is some special reason for doing so. Instructors will cancel courses with low enrollment or for other reasons, only with the approval of the dean of the college concerned.

Grades

Cumulative “B” (3.0) average — The student must maintain a “B” average (3.0) in all courses in the graduate program. No credit is given toward a graduate degree for any grade below “C” in 500, 600, 700 or 800 level courses, or below “B” in 300 or 400 level courses. All work in the major must average “B” (3.0), and all work in the minor or supporting courses must average “B” (3.0). Grades for transfer courses are not used in calculating these grade point averages. When courses used on a Plan of Study are repeated, the grade point average entered on the Plan of Study will be the average of the grades received.

Dissertation/Thesis/Research-Design Paper Credits — Graduate students usually register for dissertation/thesis/research-design paper credit during several semesters. An “in progress” (IP) is given until satisfactory completion of the dissertation/thesis/research-design paper and final oral examination. The advisor, upon satisfactory completion of these credits and final oral, will then assign a satisfactory grade (P) for all dissertation/thesis/research-design paper and sustaining credits by notifying the Registrar through the “Change of Grade” form. If not satisfactory, a grade of unsatisfactory (F) is given. Departments may elect to use Pass/Fail for Thesis and Dissertation providing the Graduate School and Registrar are notified and the policy is applied uniformly to all students in the program.

Seminars — A letter grade or a grade of Satisfactory (P) or Unsatisfactory (F) may be assigned at the discretion of the instructor.

Incomplete Grades — When a graduate student is given an Incomplete grade (I) for any course in the student’s graduate program, the instructor may indicate in writing to the student what additional work must be completed and may establish a date at which such work must be completed. A copy of this information must be filed with the Graduate School. If the work is not completed in either the manner or time prescribed, the instructor may change the Incomplete grade to whatever grade is justified as an evaluation of the student’s work or may allow the grade to remain Incomplete. Incomplete grades given without this procedure will remain as Incomplete on the student’s record unless changed because of completion of the remaining work in the course. Once the degree is awarded, Incompletes not included in the student’s graduate program can no longer be changed to letter grades.

Graduate Credit for Seniors

Seniors within 15 credits of completing a Bachelor’s degree at South Dakota State University may request permission from the Dean of the Graduate School to take up to 6 credits of 500 or 600 level courses for graduate credit. Permission requires the student to have a grade point average of at least 2.5, or a junior-senior grade point average of 3.0 or higher and to enroll for not more than 18 credits, undergraduate and graduate credits combined (9 credits during Summer Term). Forms for requesting permission to take courses for graduate credit (Senior Permits) may be obtained from the Graduate School. The student must be admitted as a special student and must register for the course at the graduate level.

Graduate Study by University Staff

Faculty members with the rank of Assistant Professor or above may not work toward an advanced degree at South Dakota State University for promotion and tenure purposes. Faculty who already hold a terminal degree required for promotion and tenure may work on an additional degree at South Dakota State University, by special approval of the Vice President for Academic Affairs. All faculty may take graduate courses for credit with the required approvals and authorization. A Graduate application should be completed. An “Authorization For Educational Benefits” form, obtained from the Personnel Office, should be completed and returned to the Personnel Office before registration.

Staff members below the rank of Assistant Professor who intend to work toward a degree at this institution must follow the regular process for admission to the Graduate School.

Full-time members of the research, instructional, or extension staffs may enroll for a maximum of 12 credits during the calendar year, with a maximum of seven in any one semester and two during the Summer Session. Staff must pay the application fee.

Postdoctoral Study

Postdoctoral students or eminent scholars who desire temporary privileges of the research facilities, staff counsel, library or seminars at the institution and who are not candidates for a degree, may pursue study upon approval of the Department Head, Dean and/or Director concerned.

Graduation

Graduation Application — The student must file a graduation application with the Graduate School by the date specified in the university calendar for the term in which completion of the advanced degree is expected. Failure to file this application will result in a delay in graduation.

Commencement Attendance — All students are urged to participate in the Commencement exercises at which their degree is to be granted. However, attendance is optional. Students must notify the Registrar of their intent to attend or not attend on a card mailed to them shortly before Commencement. Diplomas will be mailed approximately three months after Commencement. It should be noted that attendance at Commencement or inclusion in the Commencement Program does not in itself complete the degree requirements since all work on the Plan of Study must be successfully completed for the degree to be awarded.

Cap, Gown and Hood — Caps, gowns and hoods for Commencement may be rented from the University Bookstore.

Continuing Registration, Sustaining Enrollment for Dissertation/Thesis/Research-Design Paper

All graduate students who have completed the dissertation/thesis/research-design paper credits specified on their Plan of Study are required to follow one of the following each semester during the academic year and Summer term until the degree is awarded:

- a. Students who have completed the required number of dissertation/thesis/research-design paper credits on the Plan of Study but are still involved in research work as part of the degree requirement, should continue to use one credit of dissertation/thesis/research-design paper credit.
- b. Students who have completed the credits and work for the dissertation/thesis/research-design paper, and are no longer utilizing a faculty advisor's time or significant university resources, need to stay in continuous registration until all the requirements are met for graduation. Such students must register for dissertation/thesis/research-design paper sustaining until the degree is awarded. Students registered for sustaining pay a fee rather than the tuition required for credit enrollment.

Registration is the student's responsibility and must be completed and payment made prior to the 10th class day of the semester. Failure to register may delay award of the degree and thereby require additional registrations.

Appeals

The Graduate School has an academic appeal process for resolution of graduate student and faculty grievances such as prejudicial or capricious academic evaluation, cheating, and plagiarism. Procedures for appeals are available from the Graduate School.

Master's Degree Requirements

Admission Requirements

Applicants for the Master of Arts, Master of Education, and Master of Science degrees must have an approved Bachelor's degree from an accredited institution.

Advisory Committee

As a minimum, the Advisory Committee will be composed of *at least* four faculty members:

- a. *Major Advisor* — acts as chairperson of the committee, must have Graduate Faculty status.
- b. *Major Department Representative* — an additional member of the major department.
- c. *Minor/Supporting Area*, if applicable to the program — must have Graduate Faculty status. If the program does not require a minor/supporting area, an additional member of the Graduate Faculty representing the major area or a related area is required.
- d. *Graduate Faculty Representative* — The Graduate Dean will select this member from a department not closely related to the major/minor/supporting areas. This member ensures the rules and regulations are followed and acts as the student's advocate, if necessary.
- e. *Thesis Advisor* — if different from major advisor.

The major advisor should be chosen or assigned by the head of the major department. Following selection by the student and recommendation of the major advisor, the Advisory Committee should be appointed by the Dean of the Graduate School as soon as practical after starting work on the graduate program and prior to submission of a thesis or arranging for an examination. To pre-assign a Graduate Faculty representative, a memo needs to be sent to the Graduate School from the student's major advisor listing all other Committee Members. After a Representative is assigned, those involved will be contacted.

The Advisory Committee is responsible for assisting the student in developing a suitable graduate program, providing continuing guidance and counsel, and certifying the completion of the degree requirements to the Dean of the Graduate School. The Advisory Committee approves the Plan of Study and any revisions of it, approves the thesis proposal (if applicable), conducts the examinations appropriate to each option, supervises the validation of courses, and ensures that professional standards have been met in completing the degree requirements.

Plan of Study Information

Guidelines — During the first semester of graduate work and no later than the end of the first year, the Plan of Study should be prepared on the appropriate form and approved by the Advisory Committee. After approval by the Advisory Committee, the Plan of Study will be submitted to the Dean of the Graduate School for approval. Courses for the major must be taken in the major department or in related fields. At least 50% of the credits on a Plan of Study must be in courses open only to graduate students (600-series or above). Failure to submit a Plan of Study may result in disapproval of courses taken prior to approval. After approval, changes in the Plan of Study must be requested on a form furnished by the Graduate School and approved by the Advisory Committee and the Dean of the Graduate School. While devising a plan of study, refer to the "Academic Information" section in this Bulletin, beginning on page 9, in addition to the following information.

Minimum Credit Hour Requirements for Master's Degrees, per Option

	<i>Options</i>		
	<i>A</i>	<i>B</i>	<i>C</i>
Minimum total	30	32	35
Minimum major <i>including thesis or research problem (if minor or supporting area required)*</i>	19	19	19
Thesis	5-7	0	0
Research Problem	0	2	0
Minimum minor or supporting courses <i>(from two or more disciplines, if minor or supporting area required)**</i>	8	8	8

*Consult major department for requirements.

**Courses in the major department may be used as supporting courses, providing they are considered sufficiently diverse by the major department.

NOTE:

Some degree programs require additional credits; see program listings.

- Options:*
- A Thesis
 - B Research Paper/Design Paper
 - C Coursework

Residence Requirements — Residence is considered an essential component of a graduate program because it offers the student an opportunity to use and become familiar with library resources, a variety of graduate faculty and students, computer analysis, and statistical support.

The minimum residence requirement is 18 semester hours, including at least one semester or two summer sessions of graduate work spent on the Brookings campus or at an approved resident center. A resident center is an academic center recognized by South Dakota State University with an on-site director, at least one staff member who is a member of the graduate faculty, and library support through the PALS network, agreements with other institutions or equivalent accessible library resources.

Residence credit is given only for graduate credit earned in courses offered by South Dakota State University. The approved minimum residence requirement policy does not rule out exceptions for delivery of unique and innovative programs.

Minor/Supporting Area Requirement — Most Masters' programs do not require a minor or supporting area of coursework. If required, it is indicated in the listing of degrees and in the department/program section of this Bulletin. Whether required or not, consideration should be given to both depth and breadth of courses on the Plan of Study.

Language Requirement — There is no general language requirement for the Master's degree. However, individual departments may require a speaking or reading knowledge of a foreign language.

Examinations

Comprehensive — In those departments and options (academic programs) requiring a comprehensive written examination, the examination will be given by the Advisory Committee at least two weeks prior to the final oral examination, filed in the major department for review, and be present at the final oral examination. A comprehensive written examination is required of all students on non-thesis, Option C, programs.

Final — An oral examination will be administered by the Advisory Committee covering the student's Plan of Study. This examination should be comprehensive, testing the student's ability to analyze, integrate, and apply knowledge from the discipline. This examination should occur at least **ten working days** before commencement.

Research Paper/Design Paper

Students following Option B must complete at least two credits for a Research Problem (or Design Paper in Engineering) in the major field presented as a written report. The content, style, and format of the report must meet the requirements of the major department. The Research Report/Design Paper must be approved by the Advisory Committee and filed in the major department. A copy of the written report should be provided to each committee member, including the Graduate Faculty Representative, and be available at the final oral examination.

Grading — See page 11 for grading policies for Research Paper and Design Paper.

Master's Degrees and Options

Major	Degree	Options
Animal Science@	M.S.	A
Biological Sciences	M.S.	A B (<i>Biology emphasis only</i>)
Chemistry	M.S.	A
Communication Studies and Journalism	M.S.	A
Counseling and Human Resource Development	M.S.	A B C
Curriculum and Instruction	M.Ed.	B C
Economics	M.S.	A B
J.D./M.S.		A B
Educational Administration	M.Ed.	B C
Engineering# <i>(option C not available for Agricultural and Biosystems Engineering)</i>	M.S.	A B C
English	M.A.	A C
Family and Consumer Sciences^	M.S.	A B C
Geography	M.S.	A B
Health, Physical Education and Recreation	M.S.	A B
Industrial Management	M.S.	A B C
Mathematics	M.S.	A B C
Nursing	M.S.	A B
Pharmaceutical Sciences*	M.S.	A
Plant Science	M.S.	A B
Rural Sociology	M.S.	A B C
Wildlife and Fisheries Sciences	M.S.	A

@Department requires a minor/supporting area.

#M.S. in Engineering is available with coursework in:

*Agricultural and Biosystems Engineering
Civil Engineering
Computer Science
Electrical Engineering
Mechanical Engineering@
Physics*

^M.S. in Family and Consumer Sciences is available with study in:

*Human Development, Consumer and Family Sciences
Nutrition and Food Science
Family Financial Planning*

*As of July 1, 1996, the M.S. in Pharmaceutical Sciences has been put on hold. No applications will be processed.

The major fields shown (with the exception of Nursing) may be selected as minor fields, in addition to:

*Agricultural Systems Technology
Botany
Geographic Information Systems
Gerontology
History
Music
Planning
Political Science
Zoology*

Thesis

A thesis must meet the requirements of the major department and the Graduate School and must be submitted by each student completing a Master's degree in Option A. The thesis must represent a scholarly contribution to research knowledge in the major field.

Credits — A research area for the thesis topic should be chosen after consultation with the major advisor as early in the student's program as possible. A written research plan must be approved by the Advisory Committee not later than the end of the second semester of graduate work. The thesis accounts for 5 to 7 semester hours in the major.

Guidelines — The thesis may be prepared with a view to publication and conform to the style of one of the journals in the major field as required by the major department. It must be prepared in the format required by the Graduate School as shown in "Instructions for Thesis" available from the Graduate School. The thesis should be a single document rather than a compilation of individual manuscripts.

Grading — See page 11 for grading policies for Thesis.

Review — A copy of the thesis must be filed with the Graduate School for review at least **ten working days** before the oral examination. Failure to do so may cause a delay in completing the degree. The student should distribute one copy to each member of the advisory committee, including the Graduate Faculty Representative.

Binding — Two copies, one on at least 50 percent rag content paper (cotton bond), corrected in accordance with suggestions by the Advisory Committee and the Graduate School, must be returned to the Graduate School with a receipt from the Library showing the fee paid for the binding of four copies. This should be completed at least **five working days** prior to commencement.

Multiple Masters Degrees or Majors

Graduate students may pursue a second or additional master's degree in majors other than their first master's degree, providing the degree designation is different. If approved by the Advisory Committee and the Dean of the Graduate School, up to ten credits may be transferred to a second degree program.

Time Limitation

Obsolete Program — If the requirements for the Master's degree are not completed within six years from the time of admission to work toward the degree, a reconsideration of the student's program will be required and the rules of the Graduate School in effect at the beginning of the seventh year will apply.

Obsolete Coursework — Courses completed more than six years prior to completion of the requirements of the Master's degree and not part of a previous degree are regarded as obsolete coursework. Such courses may be used in the Master's degree program if validated. Validation is allowed at the discretion of the Advisory Committee and the department involved. Validation of obsolete coursework cannot exceed fifty percent of the total coursework listed on the plan of study and must be certified by the Advisory Committee on a form prescribed by the Graduate School.

Continuing Registration, Sustaining Enrollment for Thesis/Research-Design Paper — See page 12.

Master's Degree Checklist

<i>Requirements</i>	<i>When Due</i>
1. Application for Admission to Graduate School	One month before initial registration
2. Designation of Major Advisor	Prior to registration for first semester, or as soon as practical after beginning program
3. Designation of Advisory Committee	During first semester or as soon as practical after beginning program
4. Approval of Plan of Study by Advisory Committee; submit to Graduate School	During first semester
5. Approval of Thesis Proposal/Research Problem Plan	During second semester
6. Admission to Candidacy	After 20 graduate credits have been earned
7. Comprehensive Written Examination	During last semester of course work, at least two weeks before final oral examination
8. Filing of Graduation Application	Within the first three weeks of the final semester
9. Thesis/Research-Design Paper submitted to Advisory Committee	At least ten working days before the final oral examination
10. Thesis submitted to Graduate School	At least ten working days before the final oral examination
11. Request for Scheduling Oral Examination	At least ten working days before the final oral examination
12. Final Oral Examination	At least ten working days before commencement
13. Corrected copies of Thesis submitted to Graduate School and Library OR Research Paper filed in major department	At least five working days before commencement

Doctor of Philosophy Degree Requirements

Doctor of Philosophy Degrees

Majors

- *Agricultural Engineering*
Offered through a cooperative program with Iowa State University.
- *Agronomy*
- *Animal Science*
Offered in the Departments of: Animal and Range Sciences Dairy Science
- *Atmospheric, Environmental and Water Resources*
Offered in cooperation with the South Dakota School of Mines and Technology (SDSM&T).
- *Biological Sciences*
Offered in the Departments of: Animal and Range Sciences Biology and Microbiology Dairy Science Plant Science Veterinary Science Wildlife and Fisheries Sciences
Offered in cooperation with the University of South Dakota (USD).
- *Chemistry*
- *Sociology*

Admission Requirements

Applicants for the Doctor of Philosophy degree will usually have a Master's degree. This degree must be awarded from an approved, accredited institution. In those cases where applicants do not have a Master's degree, departmental requirements will apply, either requiring completion of a Master's degree or permitting an individual to move directly into a doctoral program.

Advisory Committee

After consultation with the student, the head of the major department will designate a major advisor prior to first registration where practical. During the student's first semester in residence (or before the completion of 12 credits) the major advisor will recommend to the Dean of the Graduate School members of an Advisory Committee as follows:

- a. The major advisor who acts as chairperson of the committee.
- b. The head or representative of the major department or of a department in the area of the major.
- c. An additional member of the major department or a related department.
- d. The minor advisor or a representative from an area where the supporting courses will be taken if a minor or supporting area is required. If a minor or supporting area is not required, an additional member should be recommended from the major department or a related area.
- e. The Graduate School Dean will select a fifth member from a department representing an area not closely related to the major or minor department or supporting area. This member represents the Graduate Faculty, ensuring that its rules and regulations are followed by the Committee and acts as the student's advocate, if necessary.

The above five members shall be members of the Graduate Faculty. Additional members of the committee may be requested by the student or the major advisor and assigned to the committee by the Dean of the Graduate School.

The Advisory Committee is responsible for assisting the student in developing a suitable graduate program, providing guidance and counsel, evaluating student progress, and certifying the completion of the degree requirements to the Dean of the Graduate School. The Advisory Committee approves the Plan of Study and any revision(s) of it, approves the Dissertation Proposal, reviews the Dissertation, evaluates the student's progress, conducts the comprehensive examinations and the final examination, supervises the validation of courses, and ensures that professional standards have been met in completing the degree requirements.

Plan of Study Information

Within six weeks after the Advisory Committee is formed, they will schedule a meeting with the student to approve a Plan of Study and to consider a research area for the dissertation. The Plan of Study must be prepared using the form provided by the Graduate School and approved by the Advisory Committee and the Dean of the Graduate School. Delay in submitting a Plan of Study may result in disapproval of courses taken prior to approval. The student cannot take the comprehensive written examination prior to approval of the Plan of Study. Changes in the approved Plan of Study must be requested using the form provided by Graduate School, and must be approved by the Advisory Committee and the Dean of the Graduate School. While devising your plan of study, refer to the "Academic Information" section in this Bulletin, beginning on page 9, in addition to the following information.

Plan of Study Credit Requirements

Total Credits Required — A minimum of three academic years of full-time work beyond the Bachelor's degree (minimum of 90 semester credits, 90-Credit Plan) or a minimum of two academic years of full time work beyond the Master's degree (minimum of 60 semester credits, 60-Credit Plan) are required for the Doctor of Philosophy degree. Where consideration is given to a master's degree it must be in the area of the major, minor or a related area, be an academic program from a regionally accredited institution, and be declared at the time the Plan of Study is submitted. The Advisory Committee may require more credits than the minimum listed above if it believes the extra requirements are in the best interest of the student.

Major Courses — At least 60 credits of the 90-Credit Plan or 40 credits of the 60-Credit Plan required for the degree must be earned in the major. Dissertation and transfer credits may apply. Not all courses need to be in a single department or area, but all courses applying to the major should be closely related to the major area.

Minor or Supporting Courses, if required — At least 15 credits of the 90-Credit Plan or 10 credits of the 60-Credit Plan required for the degree must be earned in a minor or in supporting courses (coursework chosen from two or more fields). Transfer credits may apply. All courses applying in the minor or supporting fields must be taken outside the major department or area, unless courses in the major department are considered sufficiently diverse by the Advisory Committee. If the degree program does not require a minor or supporting area, additional coursework from the major or related areas must be substituted for the 15 credits (90-Credit Plan) or 10 credits (60-Credit Plan).

Graduate Credit Requirement — At least 50 percent of the credits on a Plan of Study must be in courses open only to graduate students (600-series or above).

Additional Requirements — The Advisory Committee may require more credits in residence than the minimum indicated above if they feel it is in the best interest of the student.

Dissertation

Proposal — The student in consultation with the major advisor or dissertation advisor shall prepare a written dissertation proposal for approval by the Advisory Committee.

Requirements — The dissertation should represent at least one academic year of full-time research (18-30 credits). (Note: Some programs require more than 30 credits for the dissertation.) Of no specific length, it should advance or modify knowledge in the major discipline and demonstrate the candidate's mastery of the subject. The dissertation should be prepared in the style of one of the journals in the major discipline as required by the Major Department and in the format required by the Graduate School as specified in "Instructions for Dissertation." When submitted, it is accompanied by an abstract of no more than 350 words.

While the dissertation should be an integrated document providing opportunity for philosophic inquiry, the student is encouraged to develop one or more journal articles from it. Some departments may require that the journal articles be a part of the dissertation. However, the dissertation should be a single document rather than a compilation of individual manuscripts.

Review — After the dissertation is approved by the major advisor or dissertation advisor, a copy is delivered to the Graduate School. After the dissertation is found acceptable in form by the Graduate School, it is returned to the student who must distribute copies to the members of the Advisory Committee **ten working days** prior to the final oral examination.

Binding — After the final oral examination, all necessary corrections in the dissertation are made and four copies are submitted to the Library for binding. The cost for binding these

copies is the responsibility of the student. Two copies, one on at least 50 percent rag content paper (cotton bond), and an additional abstract, printed on at least 50 percent rag content paper (cotton bond), must be returned to the Graduate School with a receipt from the Library showing the binding costs paid for the four copies. This should be completed at least **five working days** prior to commencement. The student must agree to the publication of the abstract and payment for publication of the abstract and microfilming of the dissertation.

Dissertation Sustaining

See page 12, section titled "Continuing Registration, Sustaining Enrollment for Dissertation/Thesis/Research-Design Paper."

Failure to maintain registration or enrollment will automatically terminate the doctoral program. Reinstatement requires retaking the Comprehensive Written Examination with performance approved by the Advisory Committee.

Examinations

Interim Evaluation — Upon completion of approximately half of the coursework on the Plan of Study, the Advisory Committee will meet to evaluate the progress of the student, provide advice and counsel, and recommend continuance or termination of the program. Because the Doctor of Philosophy is a terminal academic degree, student performance includes an evaluation of progress in the program and academic performance. The Advisory Committee may recommend to the Dean of the Graduate School termination of the student in the program.

Comprehensive Written and Oral Examinations — When coursework has been substantially completed and the research tool requirement has been met, examinations covering coursework are taken. All members of the Graduate Faculty may listen to but not participate in the questioning. The comprehensive written examination is followed, on satisfactory completion, by an oral examination. These examinations are to test the student's knowledge and ability to integrate this knowledge in both the major and minor (or supporting courses) areas.

The Advisory Committee arranges for the exam through a memo to the Dean of the Graduate School specifying date, time, place. This memo initiates the "Notification of Action" form from the Graduate School to the Advisor who uses the form to record results of the Comprehensive Examinations. Copies of the written examination are filed in the major department. The Comprehensive Examinations must be completed at least two months before the final examination. Upon satisfactory completion of the Comprehensive Examinations, a student is formally admitted to candidacy for the Ph.D. degree. Unless a student receives the Doctor's degree within three years after becoming a candidate, Comprehensive Examinations must be repeated.

Final Examination — This examination is conducted by the Advisory Committee after notifying the Graduate School of the time and place **ten working days** prior to the examination. While the Advisory Committee determines the character and length of the examination, sufficient time should be devoted to the dissertation, including journal articles, to test the ability of the student to defend the research. In addition, questions to test the student's general knowledge, judgement and critical thinking powers are usually asked. The final oral examination cannot be taken earlier than two months following successful completion of the comprehensive examinations and must be completed **ten working days** prior to commencement.

Residence Requirements

The minimum residence requirement is 50 credits, including two semesters spent on campus. Those on full-time faculty/staff appointment and graduate assistants may satisfy the residence requirements within one academic year.

Time Limitation

Obsolete Program — If the Doctor of Philosophy degree is not completed within eight years from the time of admission to work toward the degree, a reconsideration of the student's program will be required. In such cases, the rules of the Graduate School in effect at the beginning of the ninth year will become effective for the student.

Obsolete Coursework — Courses completed more than eight years before completion of the doctorate and not part of a previous degree are regarded as obsolete coursework. Such courses may be used in the doctoral degree program if validated. Validation is allowed at the discretion of the Advisory Committee and department involved and can be accomplished by passing a written validation examination in the subject matter area. Validation of obsolete coursework cannot exceed fifty percent of the total coursework listed on the Plan of Study and must be certified by the Advisory Committee on a form provided by the Graduate School. However, credits earned as a part of a Master's degree, which are applied toward the doctoral program, remain valid.

Doctor of Philosophy Degree Checklist

<i>Requirements</i>	<i>When Due</i>
1. Application for Admission to Graduate School	One month before initial registration
2. Designation of Major Advisor	Prior to registration for first semester, where practical
3. Designation of Advisory Committee	Within first semester of graduate work or prior to 12 semester hours of graduate work
4. Approval of Plan of Study by Advisory Committee; submit to Graduate School	Within the first semester of graduate work
5. Approval of Dissertation Proposal by Advisory Committee	Before beginning research
6. Interim Evaluation by the Advisory Committee	Not later than halfway through the coursework on the Plan of Study
7. Comprehensive Examinations; Candidacy for Ph.D. Degree	Near completion of coursework and at least 2 months prior to final oral examination
8. Filing of Graduation Application	Within the first three weeks of final semester
9. Memo submitted from advisor to Graduate School requesting Final Oral Examination	At least ten working days prior to final oral examinations
10. Dissertation Due to Graduate School and Advisory Committee	At least ten working days prior to final oral examinations
11. Final Oral Examination	At least ten working days prior to commencement
12. Corrected Copies of Dissertation Due to Graduate School	At least five days prior to commencement
13. Arrangements for microfilming and binding of Dissertation	At least five days prior to commencement

Financial Information and Student Services

Application Fee — *non-refundable charge assessed all applicants for initial admission.*

Activity Fee — *A fee charged per semester to cover health, student union and other university services, such as: admission to plays, athletic events, athletic facilities, and partially funded judging, music and forensic programs.*

University Support Fee — *A fee assessed per credit to replace expendable supplies, defray cost of maintenance, repair and replacement of equipment, testing and other instruction related costs. Also to assist in providing services that benefit students which are not funded from other sources.*

Late Charge — *If you do not pay tuition and fees during the regular established payment periods, you will be assessed a late charge. If you fail to satisfy financial obligations when due, you will be administratively withdrawn from the University.*

International Student Fee — *\$100 fee required during first semester of enrollment.*

Tuition and Fees* — *Effective 5/15/00*

<i>Tuition, per credit hour</i>	<i>Cost</i>
Undergraduate Resident	\$60.40
Undergraduate Non-Resident	192.15
Graduate Resident	91.70
Graduate Non-Resident	270.40
Graduate Assistant, graduate course	30.57

<i>Fees, per credit hour</i>	<i>Cost</i>
University Support Fee	\$39.16
Activity Fee.....	12.61
Engineering Education Fee, per credit	14.54
Engineering/Science Lab fees, per course	21.00
Nursing Major Fee, per semester	144.18

See sidebars for special expenses.

**Effective Fall 2000 and subject to change by action of the Board of Regents.*

**Other tuition fees may apply for off-campus delivery.*

Payment Process

On or before registration day each student makes a full payment of charges based on the number of credits early registered for, residency status, and campus housing. Final Fee payment will be made approximately four weeks later for any additional changes to the student's bill that occurs after the registration day billing process.

Campus Card Debit System-Hobo Dough

The student identification card is used as a debit card to access prepaid accounts. In addition to its extensive use in the food service system, the ID card accesses prepaid accounts, called HOB0 DOUGH, for bookstore, campus vending, laundry, photo copying and printing, and selected off-campus businesses. Upon graduation or leaving the University, these funds will be returned in full upon request. No service charges are assessed for active accounts. However, accounts inactive for six months or more are assessed a monthly service charge. If the service charge exceeds the account balance, the account is automatically closed.

Fees for Auditing Courses

Regular tuition and fees, per credit, will be charged for auditing a course. Registration as an auditor is by add slip after registration day. Auditing courses will be a matter of record (recorded on the academic transcript). Grades will be designated by the instructor as Audit Pass (AUP) or Audit Fail (AUF). Audit courses are not counted in calculating undergraduate or graduate full-time student status.

Thesis and Dissertation Fees

Masters students must pay a fee to the Library to cover the cost of binding four thesis copies. This must be done before the Graduate School will accept the manuscript in final form.

Doctor of Philosophy students must pay a fee to the Library to cover the cost of binding four copies of the dissertation. A Money Order or Cashier's Check payable to Bell & Howell for microfilming and publishing the abstract in "Dissertation Abstracts" must accompany the final copies of the dissertation when submitting them to the Graduate School. This does not include Registration of Copyright, reprint costs or other incidental fees.

Fellowships and Assistantships

Application — A number of fellowships and administrative, research, and teaching assistantships are available to qualified graduate students admitted to degree programs. Recommendations for granting these are handled by the departments. Students interested in obtaining such financial assistance should write directly to the department in which they expect to do their major work. A minimum undergraduate grade point average of 2.75 or completion of at least 10 graduate credits with a cumulative grade point average of 3.0 is required for appointment as a graduate assistant.

Obligation — The Graduate School of South Dakota State University, as a member of the Council of Graduate Schools in the United States, subscribes and adheres to the following resolution regarding scholars, fellows, trainees, and graduate assistants. In every case in which a graduate scholarship, fellowship, traineeship, or graduate assistantship for the next academic year is offered to an actual prospective graduate student, the student, having indicated acceptance before April 15, will have complete freedom through April 15 to submit in writing a resignation of the appointment in order to accept another scholarship, fellowship, traineeship, or graduate assistantship. However, an acceptance given or left in force after April 15 commits the student not to accept another appointment without first obtaining formal release for the purpose. Students working on degree programs, including those on assistantships, are considered to have assumed an obligation to complete their graduate program before transferring to any other post-baccalaureate or professional degree program.

Financial Aid

Student financial assistance programs are administered through the student Financial Aids Office in ADM 106, or may be contacted at 605/688-4695. Graduate assistantships, fellowships, and traineeships are administered by the department or program involved.

Student Services

Detailed information on Student Life and Services is found in the General Catalog (Undergraduate Bulletin).

Academic Evaluation and Assessment Office — Students needing testing information (GRE, TOEFL, etc.) should contact this office located in Pugsley Center Room 201, telephone 605/688-4217.

Bookstore — The University bookstore is located in the University Student Union for purchase of textbooks and other supplies.

Disabled Student Services — Assistance is available for students with disabilities. The Office of Disability Services is located in ADM 318, telephone 605/688-4496.

Health Service — The Health Service provides outpatient services and is located on the second floor of West Hall. Information is available by calling 605/688-5588 for appointments.

Housing and Food Service — Prospective graduate students should inquire about rooms or apartments from the Director of Residential Life, well in advance of registration. The Residential Life Office is located in Wecota Hall 115, telephone 605/688-5148. Information concerning off-campus housing is available from the Off-Campus Housing Assistance Office, USU 062, telephone 605/688-5916.

International Student Affairs — International students should consult with the International Student Affairs Office concerning special requirements and additional expenses, ADM 312, telephone 605/688-4122.

Native American Student Advising — The Native American Student Advisor is available to aid Native American students and is located in ADM 318, telephone 605/688-4126.

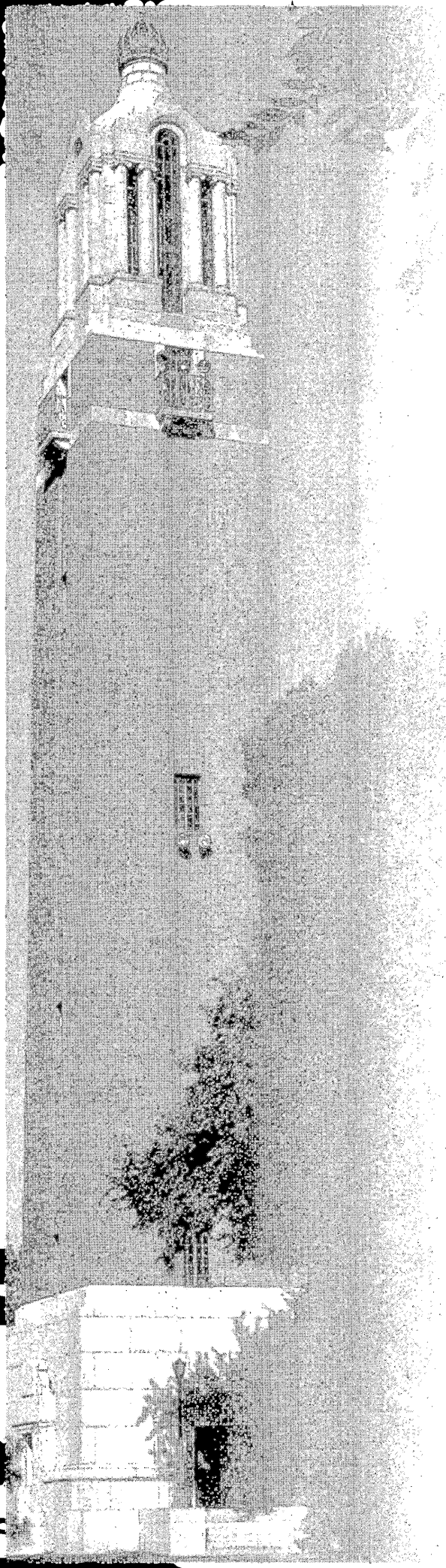
Special Expenses for Education Students —

Education students enrolled in selected Education courses are assessed a \$120 one-time fee for Master's Level Internships.

Special Expenses for Engineering Courses — *A fee of \$14.54 per credit hour is charged for courses in the College of Engineering. This fee applies to Mathematics and Computer Science courses as well.*

Engineering/Science Lab Fee — *of \$21.00 per designated course is charged to all lab classes in engineering, mathematics, and selected sciences. These funds are used for supplies and materials to purchase equipment.*

Special Expenses for Nursing Students — *Nursing majors enrolled in more than 2 credits of nursing courses are assessed a major fee of \$144.18 for the Graduate program. Students enrolled in the Family Nurse Practitioner program are assessed a fee of \$512.07 per semester.*



DEPARTMENTS OF INSTRUCTION

Agricultural and Biosystems Engineering

Degrees Offered:

- Ph.D. Agricultural and Biosystems Engineering (Cooperatively with Iowa State University)
- M.S. Engineering
 - Agricultural and Biosystems Engineering coursework emphasis
- M.S. Animal Science
 - Production and Processing emphasis

Graduate Faculty

Michael F. Adelaine
Associate Professor
Ph.D., University of Nebraska-
Lincoln, 1989
Adult Education, Community
Development

Gary A. Anderson
Professor
Ph.D., Iowa State University of
Science and Technology,
1987
Environment, Structures

Mylo A. Hellickson
Professor
Ph.D., West Virginia
University, 1969
Energy Systems, Structures

Daniel S. Humburg
Associate Professor
Ph.D., University of Illinois,
1991
Machine Design, Machine
Vision

James L. Julson
Associate Professor
Ph.D., University of Nebraska -
Lincoln, 1998
Biological Materials, Value
Added

Van C. Kelley
Assistant Professor
Ph.D., University of Illinois-
Urbana, 1978
Structural Analysis, Light
Frame Structures

Kasisviswanathan
Muthukumarappan
Assistant Professor
Ph.D., University of Wisconsin,
1993
Food and Biomaterials
Processing

Acting Department Head: Assistant Professor Van C. Kelley
Graduate Coordinator: Professor Gary A. Anderson

For additional information contact:

Mailing address: SDSU Box 2120

Agricultural and Biosystems Engineering — ABE

WWW: <http://www.abs.sdstate.edu/>

E-mail: abe.dept@abs.sdstate.edu

Phone: 605/688-5141

Fax: 605/688-6764

Program Description

The Department of Agricultural and Biosystems Engineering offers coursework toward the Master of Science in Engineering. The M.S. in Engineering has a primary and secondary core requirement as defined in the College of Engineering section of this catalog on page 78. Areas of specialization include machine vision, food and biological-materials processing, natural resources engineering, structures, indoor environment and machine design.

The Department currently offers a Ph.D. degree in cooperation with Iowa State University. The area of specialization pertaining to the cooperative Ph.D. is in natural resources engineering.

Available Options for Graduate Degrees

Master of Science: Option A
 Option B

See page 15 for descriptions of available options.

Core Requirements

Refer to College of Engineering section, pages 78-80, for specific details regarding Engineering, with an emphasis in Agricultural and Biosystems Engineering.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

General Requirements begin on page 13 (Master's Degree) and page 18 (Ph.D.).
Graduate students should consult with their advisor before registering for graduate work.

Agricultural and Biosystems Engineering (ABE) Course Offerings

ABE 503 Energy & Environment 3
Discussion of conventional energy sources, their historic and projected use patterns, predicted resources and energy conservation. Evaluation of alternate energy sources such as solar, wind, biomass, tidal, geothermal, ocean thermal, oil shale and nuclear. Energy and the environment and energy and the agricultural industry.

ABE 512 Advanced Agricultural Tractors & Machines2
Units of instruction will be selected from the following areas: tractor chassis mechanics and dynamics, transmissions, hydraulics, human factors considerations for agricultural machine operators, soil dynamics in tillage and machine-plant concepts. P, Math 321 or equivalent.

ABE 522 Bio-environmental Engineering	2
Analysis of farm animals and their environment employing engineering principles combined with biological principles. Homeothermic mechanisms of animals and the influence of thermal environment upon growth and production. P, AE 324 or consent.	
ABE 533 Advanced Irrigation Engineering	3
Basic soil-water-crop relationships. Theory and design of pumping plants, surface, sprinkler, and drip irrigation systems. P, AE 434 or consent.	
ABE 533A Advanced Irrigation Engineering Lab	0
ABE 544 Unit Operations of Biological Materials Processing	4 S
Transport processes of heat and mass are applied to the following unit operations: evaporation, drying, gas liquid separation processes (humidification cooling towers), vapor-liquid separation processes (distillation), soil-liquid separation processes (leaching), membrane separations (ultrafiltration, reverse osmosis), mechanical separation processes, extrusion. P, senior standing or consent.	
ABE 544A Unit Operations of Biological Materials Processing Lab	0
ABE 554 Advanced Unit Operations in Food/Biomaterials Processing	4
Advanced study of engineering principles as they apply to unit operations for food preservation and processing, including effect of heat and time on the lethality of undesirable food microorganisms, heat transfer with foods and containers and its effect on food safety, freezing and refrigeration technology, high temperature short time extrusion processing, and aseptic processing. P, senior standing or consent.	
ABE 554A Advanced Unit Operations in Food/Biomaterials Processing Lab	0
ABE 700-701 Seminar	0-1
ABE 732 Advanced Hydrology in Ag	2
Small watershed hydrology principles. Unit hydrograph theory. Infiltration and evapotranspiration processes. Small watershed surface runoff simulation. Soil erosion principles. P, consent.	
ABE 733 Ground Water Engineering in Ag	3
Saturated and unsaturated ground water flow theory. Steady and transient well hydraulics. Aquifer groundwater flow simulation. Infiltration models. Vadose zone simulation. Groundwater recharge. P, consent.	
ABE 752 Theoretical Micro-Climatology	2
Derivation and application of physical laws to air layer near the ground occupied by plants and animals. Instruments used to take measurements in layer near ground. P, Calculus, Physics, AE 353 or consent.	
ABE 763 Instrumentation	3
Principles of transducers, amplifiers and terminating devices in measurement systems with emphasis on transducers and systems performance. Techniques and methods for use in engineering and scientific measurement. P, Phys 213, Math 225.	
ABE 763A Instrumentation Lab	0
ABE 770 Special Problems in Ag Engineering	1-2 (on demand)
Graduate students who wish to pursue detailed studies in one or several areas of the Agricultural and Biosystems Engineering field including meteorology and climatology.	
ABE 771 Graduate Seminar	1
Discussion and reports of current topics and investigations in Agricultural and Biosystems Engineering. (Limit of 2 credits.)	
ABE 772 Similitude	2
A systematic approach to the principles and theory of dimensional analysis, problems of model design and test. The use of true, distorted and dissimilar models as they pertain to engineering design and research.	
ABE 772A Similitude Lab	0
ABE 773 Programming Agricultural Systems	3
The use of programs and computers in advanced engineering for the solution of problems occurring in Agricultural and Biosystems Engineering studies. Gathering, processing, evaluating mass engineering and scientific data. P, BASIC or FORTRAN.	
ABE 773A Programming Agricultural Systems Lab	0
ABE 790 Thesis	1-7 FSSu
ABE 791 Thesis Sustaining	0 FSSu
ABE 792 Research Report/ Design Paper	1-2 FSSu (on demand)
ABE 793 Engineering Research/Design Paper Sustaining	0
ABE 795 Special Topics	1-3 (on demand)

*Hal D. Werner
Professor
Ph.D., University of
Minnesota, 1984
Irrigation, Drainage*

Key to Course Descriptions

Course Number & Name Credits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

ABE 797 Research1-9
 ABE 890 Dissertation, Ph.D.1-12
 ABE 891 Dissertation, Ph.D. Sustaining0

Agricultural Systems Technology (AST) Course Offerings

AST 512 Hydraulic and Pneumatic Systems and Controls2 Su (even years)
 Principles of fluid power, hydraulic and pneumatic components and system function. Component selection and off-the-shelf system design. Manual, microprocessor and electronic control of systems.

AST 512A Hydraulic and Pneumatic Systems and Controls Lab0

AST 522 Environmental Control in Structures.....2 Su (even years)
 Study of heat and moisture balance, gases, dust, and odors. Selection and design of fans, ducts, diffusers and efficient ventilation patterns.

AST 522A Environmental Control in Structures Lab0

AST 562 Advanced Irrigation Mechanics & Practices2 Su (odd years)
 Sprinkler, surface and trickle irrigation systems and equipment. Irrigation scheduling, management, and economics. Water laws and irrigation program financing. Water quality and environmental impact of irrigation.

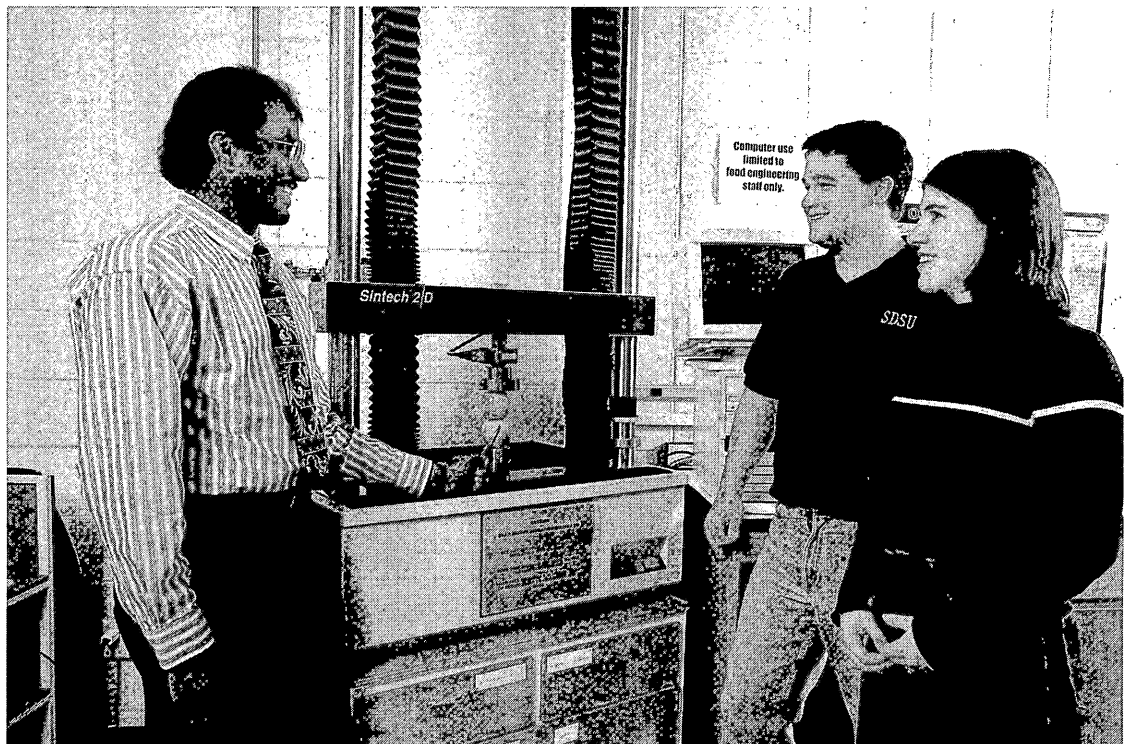
AST 562A Advanced Irrigation Mechanics & Practices Lab0

AST 582 Advanced Farm Engines2 Su (odd years)
 Operation, selection, care, adjustment, and new development of internal combustion engines as applied to farm power units.

AST 582A Advanced Farm Engines Lab0

AST 792 Special Problems1-3 FSSu

AST 793 Special Topics1-4 FSSu



Agriculture and Biological Sciences

Coursework for following degrees:

Ph.D. Agronomy, *See page 122*

Ph.D. Animal Science, *See page 31*

Ph.D. Biological Sciences, *See page 37*

M.S. Animal Science, *See page 31*

M.S. Biological Sciences, *See page 37*

M.S. Plant Science, *See page 122*

ABS 701 Animal Systems1-10 FSSu

Advanced study in animal systems. Credit earned will depend on the module(s) taken. Each module requires a colloquium (reports and discussions) of current investigations related to the module selected. Course may be repeated as long as the module(s) are not repeated. Potential topic modules could include: ruminant nutrition, advanced physiology of reproduction, vitamins and minerals, protein and energy nutrition, monogastric nutrition, animal growth and development, meat science, cellular signal transduction, biology of aging, physiology of lactation, laboratory techniques in dairy science, systemic physiology, molecular aspects of immunology, behavioral management of insects, biological control of arthropods, nematology, immature insects, insect taxonomy, insect anatomy and physiology, and other topics as needed. P, consent of module instructor.

ABS 702 Genetics1-10 FSSu

Advanced study in genetics. Credit earned will depend on the module(s) taken. Each module requires a colloquium (reports and discussions) of current investigations related to the module selected. Course may be repeated as long as the module(s) are not repeated. Potential topic modules could include: molecular evolution, genetics of development, cytogenetics, population genetics, animal breeding, plant breeding, advanced genetics, quantitative genetics, and other topics as needed. P, consent of module instructor.

ABS 703 Microbial Systems1-10 FSSu

Advanced study in microbial systems. Credit earned will depend on the module(s) taken. Each module requires a colloquium (reports and discussions) of current investigations related to the module selected. Course may be repeated as long as the module(s) are not repeated. Potential topic modules could include: bacterial molecular, virology, prokaryotic evolution & phylogeny, metabolism of microbes, bacterial systematics, industrial microbiology, ruminology, dairy microbiology, viral infections, bacterial infections, viral and bacterial disease of plants, mycology, and other topics as needed. P, consent of module instructor.

ABS 704 Plant Systems1-10 FSSu

Advanced study in plant systems. Credit earned will depend on the module(s) taken. Each module requires a colloquium (reports and discussions) of current investigations related to the module selected. Course may be repeated as long as the module(s) are not repeated. Potential topic modules could include: advanced weed science, crop-water relationships, environmental and physiological aspects of crop production, environmental stress physiology, field studies in plant disease diagnosis, host-plant pathogen interactions and genetics of plant disease resistance, metabolism during stress, physiology of plants, plant growth and development, plant molecular biology, and other topics as needed. P, consent of module instructor.

ABS 705 Research Methodology1-10 FSSu

Advanced instruction in research methodology. Credit earned will depend on the module(s) taken. Each module will provide in-depth coverage of one type of technique. Modules will involve lectures on the theory behind a technique, simulations/demonstrations of the technique, and hands on experiments. Each module requires a colloquium (reports and discussions) designed to show the student how these techniques can be combined to solve a research problem. Course may be repeated as long as the module(s) are not repeated. Potential topic modules could include: Electrophoresis, liquid chromatography, spectroscopy, centrifugation, hybridization, cloning, PCR, monoclonal antibodies,

protein characterization, light microscopy, electron microscopy, in situ hybridization, fluorescent imaging, chromosomal analysis, plant tissue culture, mammalian tissue culture, anaerobic bacterial culture, design of ecological field studies, sampling of terrestrial plants, sampling of aquatic plants, sampling of terrestrial animals, sampling of aquatic animals, geographic information systems and global positioning systems in ecology, analysis of ecological data, modeling and simulation in ecology, crop breeding techniques, and other topics as needed. P, consent of module instructor.

ABS 706 Natural Resource Management1-10 FSSu

Advanced study in natural resource management. Credit earned will depend on the module(s) taken. Each module requires a colloquium (reports and discussion) of current investigations related to the module selected. Course may be repeated as long as the module(s) are not repeated. Potential modules include: advanced ecology; advanced plant ecology; advanced soil genesis; agristology; agroecology; algae; applied insect ecology; aquatic plants; chemical properties of soils; disturbance ecology; ecological monitoring; ecotoxicology; environmental biology; environmental soil chemistry; field studies in pedology; ground water protection; landscape ecology; physical properties of soils; precision farming; soil and plant analysis; soil microbiology; soil N,P, and K; soil/plant secondary macro/micronutrients; water quality in agriculture; and other topics as needed. P, consent of module instructor.

Animal and Range Sciences

Degrees Offered:

Ph.D. Animal Science

Ph.D. Biological Sciences, *See page 37*

- Animal and Range Sciences emphasis

M.S. Animal Science

- Genetics and Reproduction emphasis
- Meats, Muscle Biology and Growth emphasis
- Nutrition emphasis
- Range Science emphasis

Department Head: Professor Donald L. Boggs
Graduate Coordinator: Professor Lowell Slyter

For additional information contact:

Mailing address: SDSU Box 2170

Animal Science Complex — ASC

WWW: <http://www.abs.sdstate.edu/ars/index.htm>

E-mail: Donald_Boggs@sdstate.edu

Phone: 605/688-5166

Fax: 605/688-6170

Program Description

The Department of Animal and Range Sciences offers graduate programs leading to the Master of Science degree in Animal Science with emphases in Nutrition; Genetics and Reproduction; Meats, Muscle Biology and Growth; and Range Science. The Department offers graduate programs leading to the Doctor of Philosophy degree in Animal Science or Biological Sciences. Animal and Range Science faculty and graduate students are actively involved in basic and/or applied research in the fields of nutrition, reproductive physiology, muscle biology, range science, animal breeding, meat science and animal production.

The department is committed to providing graduate students with quality educational and research experiences and preparing them to meet the challenges of a very competitive job market upon graduation.

Available Options for Graduate Degrees

Master of Science: Option A

Doctor of Philosophy: 60-Credit Plan
90-Credit Plan

See pages 15 (M.S.) and 18 (Ph.D.) for descriptions of available options.

Graduate Faculty

Donald L. Boggs
Professor

Ph.D., Michigan State
University, 1982
Ruminant Nutrition

Jeffrey A. Clapper
Assistant Professor
Ph.D., Purdue University, 1992
Reproductive Physiology

Bradley J. Johnson
Assistant Professor
Ph.D., University of Minnesota,
1998
Growth and Development

Patricia S. Johnson
Professor
Ph.D., Utah State University,
1987
Range Science

Donald M. Marshall
Professor
Ph.D., Oklahoma State
University, 1984
Animal Breeding

Douglas C. McFarland
Professor
Ph.D., Washington State
University, 1984
Muscle Biology

Herley L. Miller
Associate Professor
Ph.D., Purdue University, 1973
Reproductive Physiology

Robbi H. Pritchard
 Professor
 Ph.D., Washington State
 University, 1983
 Ruminant Nutrition

Richard J. Pruitt
 Professor
 Ph.D., Kansas State University,
 1983
 Cow-Calf Management

Lowell Slyter
 Professor
 Ph.D., Kansas State University,
 1969
 Reproductive Physiology/Sheep
 Management

Robert C. Thaler
 Professor
 Ph.D., Kansas State University,
 1988
 Swine Nutrition

Duane M. Wulf
 Assistant Professor
 Ph.D., Colorado State
 University, 1996
 Meat Science

Core Requirements

- Students are required to take AS 790, Thesis for 5-7 credits and AS 781, Seminar for 2 credits (two semesters of 1 credit each).
- At least three courses (8-9 credits) from the following courses are also required.

Chem 662	Principles of Biochemistry	3 credits
Stat 541	Statistical Methods II.....	3 credits
AS 731	Experimental Procedures.....	3 credits
AS 750	Animal Growth and Development	3 credits
Vet 723	Systemic Physiology	4 credits
DS/AS 711	Ruminology	3 credits
DS 731	Laboratory Techniques in Dairy Science.....	2 credits
AE 554	Advanced Food/Biomaterials Processing.....	4 credits
AST 522	Environmental Control in Structures.....	2 credits
Bot 727	Advanced Plant Physiology.....	4 credits
ABS 705	Research Methodology	3 credits
ABS 706	Natural Resource Management	3 credits
- 12-14 credits of discipline specific courses are required of Option A students for a requirement of 30 credits total.

Doctor of Philosophy

2 credits of Graduate Seminar
 Present seminar on dissertation

Additional Admission Requirements

TOEFL: required score of 550
 GRE: Not required
 Submit a current resume and a letter of application that outlines interests and goals in addition to materials required by the Graduate School.
 Undergraduate degree in field related to area of emphasis or contact department for minimal undergraduate preparation requirements.

General Requirements begin on page 13 (Master's Degree) and 18 (Ph.D.).

Graduate students should consult with their advisor before registering for graduate work.

Animal Science (AS) Course Offerings

- AS 591 Research Problems.....1-3 FSSu**
 Investigation of problems in following areas with results submitted as technical paper: Animal Breeding, Nutrition, Meats, Livestock Production, Reproductive Physiology, Wool Technology, Poultry. Maximum of 3 credits for student program.
- AS 592 Special Topics.....1-6 FS**
 Advanced study of one or more selected topics: breeding, management, product technology, physiology, nutrition, research methods or marketing.
- AS 711 Ruminology.....3 F (odd years)**
 Biochemical, physiological, and microbiological activity occurring in the rumen and the relation of rumen function to animal response. P, Chem 361 and Vet 223 or consent.
- AS 712 Ruminant Nutrition.....3 S (even years)**
 Principles of nutrition for ruminants in relation to growth, reproduction and lactation. P, AS 233, AS 323, Chem 361, Vet 223 or Zool 325.
- AS 723 Population Genetics.....3 S (odd years)**
 Genetic structure of populations and forces affecting this structure. Theories of biological variation, race and species formation. P, Bio 371 or equivalent. Stat 541 or equivalent highly recommended.
- AS 731 Experimental Procedures.....2 Su (even years)**
 Research methods and planning of experimental work, necessary records, interpretation of results and presentation of material. Introduction to research application of linear programming. P, Stat 541 or equivalent.
- AS 732 Advanced Physiology of Reproduction.....3 S (even years)**
 Anatomical and physiological process of reproduction in domestic animals with special emphasis on research techniques and the findings of recent research. P, AS 433.
- AS 732A Advanced Physiology of Reproduction Lab.....0**

AS 733 Vitamins and Minerals	3 S (odd years)
Relationships between nutrients in metabolism. Comparing metabolic significance of required nutrients for different animal species and as applied to human nutrition. P, AS 233, AS 323, Chem 361, Vet 223 or Zool 325.	
AS 734 Protein and Energy Nutrition	3 F (even years)
Principles of protein and energy metabolism and the partitioning of these nutrients for maintenance, growth and production in domestic farm animals. P, AS 233, AS 323, Chem 361, Vet 223 or Zool 325.	
AS 736 Monogastric Nutrition	3 F (even years)
Nutrition principles for nonruminants related to reproduction, lactation and growth. P, AS 233, AS 323, Chem 361, Vet 223 or Zool 325.	
AS 750 Animal Growth and Development	3 S (even years)
Growth of animals at the cellular level, including hormones, growth factors, receptors and signalling and growth at the whole animal level.	
AS 753 Meat Science	3 F (even years)
Basic physical, chemical, microbiological and histological characteristics of meat and effects of various processing methods on meat products and by-products. P, AS 241, Chem 361.	
AS 753A Meat Science Lab	0
AS 781 Graduate Seminar	1 FS
Reports and discussion of current research in animal science. Maximum of two credits for M.S. and four credits for Ph.D.	
AS 790 Thesis	1-7 FSSu (as arranged)
AS 791 Thesis Sustaining, M.S.	0 FSSu (as arranged)
AS 890 Dissertation, Ph.D.	1-12 FSSu (as arranged)
AS 891 Dissertation Sustaining, Ph.D.	0 FSSu (as arranged)

Biological Sciences (BioS) Course Offerings

BioS 890 Dissertation—Ph.D	1-7 FSSu
BioS 891 Dissertation Sustaining	0 FSSu
BioS 892 Ph.D. Seminar	1 FS

Range Science (Rang) Course Offerings

Rang 521 Grassland Fire Ecology	3 F
The course is designed to describe the ecological effects of fire on grassland ecosystems. It also provides insight into the history of fires, the people who use them and why, the parts of a fire, how fires behave in relation to fuel and weather, and the conducting and safety of prescribed burns. P, consent; Cross-list with WL 421-521.	
Rang 521A Grassland Fire Ecology Lab	0
Rang 591 Research Problems in Range Science	1-3 FSSu
Investigation of problems in Range Science with results submitted as a technical paper.	
Rang 592 Special Topics	1-3 FSSu
Advanced study of one or more selected topics in Range Science including Grassland Fire Ecology and Grazing Management.	

Key to Course Descriptions

Course Number & Name	Credits
	F = Fall
	S = Spring
	Su = Summer
	(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Apparel Merchandising and Interior Design

Coursework only offered

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Acting Department Head: Professor Laurie Stenberg Nichols

For additional information contact:

Mailing address: SDSU Box 2275A

Nursing/Family/A&S — NFA

WWW: <http://www.dbf.sdstate.edu/fcs/amid/index.htm>

Phone: 605/688-5196

Fax: 605/688-4439

Program Description

Courses offered in Apparel Merchandising and Interior Design support the Master of Science in Family and Consumer Sciences degree program. Students may select courses in Apparel Merchandising and Interior Design to support their graduate program.

Refer to College of Family and Consumer Sciences section, pages 84-85, for specific details. These courses are not currently scheduled.

Apparel Merchandising (AM) Course Offerings

- AM 580 Travel Studies**1-5
Study of businesses, museums, and other relevant places through site tours and presentations in selected locations. Includes pre-travel orientation and post-travel written report. P, consent of department.
- AM 592 Special Problems**1-3
Problems for independent study selected according to special interests and needs. Arranged by contract with instructor.
- AM 593 Current Topics**1-3
Discussion of current literature and issues. Investigation of topics for which there is a current need but which are not part of any class. P, consent.
- AM 770 Seminar in Apparel Merchandising & Textiles**1-2
- AM 792 Special Problems**1-3
Problems for advanced study selected according to student's specific interests, needs or current research with which student is familiar. Credit arranged by professor in charge. Can be repeated.

Interior Design (ID) Course Offerings

- ID 573 Travel Studies**.....1-5 Su
Study of businesses, museums and other relevant places through site tours and presentations in selected locations. Includes pre-travel orientation and post-travel written report. P, consent of department.
- ID 592 Special Problems**1-3
Problems for independent study selected according to special interests and needs. Arranged by contract with instructor.
- ID 593 Current Topics** 1-3
Discussion of current literature and issues. Investigation of topics for which there is a current need but not part of any class. P, consent.

Art

Coursework only offered

Department Head: Professor Norman R. Gambill

For additional information contact:

Mailing address: SDSU Box 2223

Grove Hall — GC

E-mail: sdsu_artdept.sdstate.edu

Phone: 605/688-4103

Fax: 605/688-6769

Graduate Faculty

Norman R. Gambill

Professor

*Ph.D., Syracuse University,
1976*

*American Studies, Art History,
Film History, Popular
Culture*

Art Education (ArtE) Course Offerings

ArtE 592 Special Problems in Visual Arts1-3

Atmospheric, Environmental and Water Resources

Degree Offered:

Ph.D. Atmospheric, Environmental and Water Resources

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Coordinator: Professor Vernon R. Schaefer

For additional information contact:

Mailing address: SDSU Box 2219

Crothers Engineering Hall — CEH

WWW: <http://www.engineering.sdstate.edu/>

E-mail: SDSU_NGPWRRC@sdstate.edu

Phone: 605/688-6252

Fax: 605/688-5878

Program Description

The Doctor of Philosophy degree in Atmospheric, Environmental and Water Resources (AEWR) is a research degree designed to develop the student's capacity to make significant contributions in understanding the physical processes taking place in the atmosphere and at the land surface, and the complex issues associated with the development, use, and protection of precious water resources. The program is a joint effort with the South Dakota School of Mines and Technology (SDSM&T) in Rapid City, South Dakota, in the three fields of atmospheric, environmental, and water resources. The primary departments and disciplines involved in the programs are Civil and Environmental Engineering, Agricultural Engineering, Chemistry, Plant Science, Biology, and Wildlife and Fisheries Sciences. At SDSM&T, the departments and disciplines involved are Civil and Environmental Engineering, Geology and Geological Engineering, Meteorology, Chemical Engineering and Chemistry.

Core Requirements

A common program core will be required of all students, which includes four courses and seminars taken by all students in the joint program. These courses were chosen to give every student in the program breadth of knowledge across the three disciplines and to assure some capability in modeling. The requirement of breadth in the three subject areas will be obtained by students through taking the core courses or by equivalent knowledge as determined by the students' graduate committee.

The primary core courses consist of:

CEE 721	Environmental Engineering, SDSU/SDSM&T
CEE 535	Water Resources Engineering, SDSU/SDSM&T
MTRO 611	Air Pollution, SDSM&T
CEE 784	Modeling and Computations, SDSM&T

In addition, each student will be required to take a minimum of three one-credit seminar courses. The residence requirement is two consecutive semesters. The program requires a minimum 30 dissertation credits. The students' graduate committee will set the course and dissertation requirements consistent with university regulations based on the knowledge base of each student. The graduate advisory committee will determine the exact distribution of credits between coursework and research for a minimum total of 90 credits.

The Rural Development Telecommunications Network (RDTN) and other networks will be used to provide instruction from one university to the other. All AEWR students are required to take a minimum of one 3-credit course at the other participating institution exclusive of the three seminars.

General Requirements begin on page 18 (Ph.D.).

Graduate students should consult with their advisor before registering for graduate work.

Atmospheric, Environmental and Water Resources (AEWR) Course Offerings

AEWR 793 Research Seminar	1
AEWR 890 Dissertation Ph.D.....	1-12
AEWR 891 Dissertation Ph.D. Sustaining.....	0

Biological Sciences

Degrees Offered:

Ph.D. Biological Sciences

- Animal and Range Sciences area, *See page 31*
- Biology area, *See page 40*
- Dairy Manufacturing area, *See page 61*
- Fisheries Science area, *See page 133*
- Microbiology area, *See page 40*
- Plant Molecular Biology area, *See page 122*
- Veterinary Microbiology area, *See page 131*
- Veterinary Pathobiology area, *See page 131*
- Wildlife Science area, *See page 133*

M.S. Biological Sciences

- Biology emphasis, *See page 40*
- Dairy Manufacturing emphasis, *See page 61*
- Food & Biomaterial Processing emphasis, *See page 26*
- Horticultural Science emphasis, *See page 93*
- Human Nutrition & Food Science emphasis, *See page 112*
- Microbiology emphasis, *See page 40*
- Pharmaceutical Science emphasis, *See page 114*
- Veterinary Science emphasis, *See page 131*

Ph.D. Coordinator: Associate Professor Chris Chase

For additional information contact:

Mailing address: SDSU Box 2175

Phone: 605/688-5652

Animal Disease Research & Diagnostic Laboratory — ADRDL Fax: 605/688-6003

WWW: <http://www.vetsci.sdstate.edu/d-grad.html>

E-mail: Christopher_Chase@sdstate.edu

Program Description

This is a cooperative program leading to the Doctor of Philosophy degree in Biological Sciences with emphasis in various areas of either molecular and cellular biology, or natural resources. Departments that cooperate in the program are the Departments of Animal and Range Sciences, Biology and Microbiology, Dairy Science, Plant Science, Veterinary Science and Wildlife and Fisheries Sciences at South Dakota State University, and the Department of Biology at the University of South Dakota.

This program allows for considerable latitude in the education and training of students. The plan of study, including a range of 30-40 hours of dissertation credit, can be designed to meet the interests and individual needs of the student. While the training of most students is largely directed to a single discipline represented within one of the participating departments, cross-discipline training is available. Generally, identification of a major professor with resources to support the student's dissertation project is required for unconditional acceptance into the program. Therefore, interested persons should make application for program admission substantially before the anticipated date of enrollment.

Please refer to each departmental section for a listing of the graduate faculty and details regarding the areas of study offered in this program. Inquiries should be made directly to the department representing the discipline of interest.

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation
are offered either FS or FSSu.

Course Description as written
by department and approved by
the Board of Regents.

P = Prerequisite

Core Requirements

The Biological Sciences program has only two specific course requirements:

Stat 541 Statistical Methods II.....	3
BioS 892 Seminar.....	1

(two semesters of 1 credit each)

All students are required to present a seminar on their dissertation project. All other courses submitted in the doctoral candidate's plan of study are approved by the student's advisory committee.

General Requirements begin on page 18 (Ph.D.). Graduate students should consult with their advisor before registering for graduate work.

M.S. Coordinator: Professor Charles R. McMullen

For additional information contact:

Mailing address: SDSU Box 2207

Phone: 605/688-5133

Academic Programs Office

Fax: 605/688-5582

College of Agriculture and Biological Sciences

E-mail: academic.programs@abs.sdstate.edu

Program Description

This is a collaborative graduate program leading to the Master of Science degree in Biological Sciences. Departments that cooperate in the program are the Departments of Agricultural and Biosystems Engineering, Biology and Microbiology, Dairy Science, Horticulture, Forestry, Landscape and Parks, Nutrition, Food Science and Hospitality, Pharmaceutical Sciences, and Veterinary Science.

Students interested in advanced studies in the biological sciences will have the opportunity to tailor a program that meets their interest by selecting courses offered by faculty from the participating departments. Each student's plan will be developed in consultation with the student's major advisor and graduate advisory committee. The plan of study including a common core of 5-7 credits of thesis, 2 credits of seminar and 9 additional course credits will be designed to meet the interests and individual needs of the student. While the training of most students is largely directed to a single discipline, cross-discipline training is available and encouraged. Generally, identification of a major professor with resources to support the student's thesis project is required for unconditional acceptance into the program.

Please refer to each departmental section for a listing of the graduate faculty and details regarding the areas of study offered in this program. Inquiries should be made directly to the department representing the discipline of interest.

Available Options for Graduate Degrees

Master of Science: Option A (thesis required)
 Option B (research paper required; Biology emphasis only)

Core Requirements

1. Option A students required to take BioS 790 Thesis for 5-7 credits and BioS 792, Seminar for 2 credits (two semesters of 1 credit each).
Option B students required to take Bio 793, Biological Research Problems for 3 credits and BioS 792, Seminar for 2 credits.

2. At least 9 credits from the following courses is required; additional courses from this list may be taken toward discipline course requirement; the courses will be identified on the student's Plan of Study no later than the end of the first year of study:

ABS 705	Research Methology	variable credit depending on module(s) taken
ABE 503	Energy & Environment	3 credits
ABE 554	Advanced Unti Operations in Food/Biomaterials Processing	3 credits
Chem 662	Principles of Biochemistry	3 credits
DS 722	Advanced Dairy Microbiology	3 credits
Ho 580	Environmental Stress Physiology	3 credits
NFSH 725	Nutrition and Human Performance	3 credits
Pha 740	Advanced Pharmacology.....	3 credits
Stat 541	Statistical Methods II	3 credits
Vet 524	Medical and Veterinary Virology	3 credits

3. At least 12-14 credits of discipline specific courses are required of Option A students. Option B students are required to take 18 discipline specific courses. (Option A requirement is 30 total credits and Option B requirement is 32 total credits.)

The student, Major Advisor and Advisory Committee select the discipline specific emphasis area of the biological sciences. The courses will be identified on the student's Plan of Study no later than the end of the first year of study.

The listing of courses is available within the departments participating in graduate education in the sciences at SDSU. The departments that courses are expected to be routinely selected from include Agricultural and Biosystems Engineering; Animal and Range Sciences; Biology and Microbiology; Chemistry and Biochemistry; Dairy Science; Horticulture, Landscape and Parks; Nutrition, Food Science and Hospitality; Pharmaceutical Sciences; Plant Science; Veterinary Science; and Wildlife and Fisheries Sciences.

General Requirements begin on page 18 (Ph.D.).

Graduate students should consult with their advisor before registering for graduate work.

Biological Sciences (BioS) Course Offerings

BioS 890 Dissertation—Ph.D.	1-7 FSSu
BioS 891 Dissertation Sustaining	0 FSSu
BioS 892 Ph.D. Seminar	1 S

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Biology and Microbiology

Degrees Offered:

Ph.D. Biological Sciences

- Biology/Microbiology area of study

M.S. Biological Sciences

- Biology and Microbiology emphases

Graduate Faculty

Bruce Bleakley
Associate Professor
Ph.D., University of Florida,
1986
Soil Microbiology

Thomas M. Cheesbrough
Associate Professor
Ph.D., Purdue University, 1982
Plant Molecular Biology

Charles D. Dieter
Assistant Professor
Ph.D., South Dakota State
University, 1993
Wildlife Ecologist

William Ray Gibbons
Professor
Ph.D., South Dakota State
University, 1987
Industrial Microbiology

Susan A. Gibson
Associate Professor
Ph.D., University of Oklahoma,
1989
Environmental Microbiology

Tagir G. Gilmanov
Assistant Professor
Ph.D., Moscow State
University, 1976
Ecological Modeling

Nels H. Granholm
Professor
Ph.D., Iowa State University of
Science and Technology, 1968
Developmental Genetics

Michael Hildreth
Professor
Ph.D., Tulane University, 1983
Parasitology

David J. Hurley
Associate Professor
Ph.D., Pennsylvania State
University, 1988
Immunology and Biophysics

Acting Department Head: Professor Gary B. Peterson

Graduate Coordinator: Professor Carl A. Westby

For additional information contact:

Mailing address: SDSU Box 2207B

Agricultural Hall — AGH

WWW: <http://www.abs.sdstate.edu/bio>

E-mail: biomicro@abs.sdstate.edu

Phone: 605/688-6141

Fax: 605/688-6677

Program Description

The Department of Biology and Microbiology provides students with a wide range of opportunities for advanced study. The graduate faculty offer expertise and graduate student advisement in subdisciplines from molecular biology through ecology. Faculty members are very successful in obtaining extramural funds to support graduate student projects. Graduate students have modern research laboratories, equipment and field research sites available to carry out their research projects. Alumni rate the learning environment, scholarly excellence and quality of teaching as areas of strength in the department's graduate program.

Available Options for Graduate Degrees

Master of Science: Option A (Microbiology)
Option A and B (Biology)

Doctor of Philosophy: 60-Credit Option
90-Credit Option

See pages 15 (M.S.) and 18 (Ph.D.) for descriptions of available options.

Core Requirements

All M.S. and Ph.D. students are required to take two credits of graduate seminar.

Additional Admission Requirements

GRE: Required by all applicants

TOEFL: Graduate School requirement of 525

Qualifying examinations will be given to all first-year graduate students at the end of their second semester. Students entering the program with an approved M.S. may be exempted from this exam. This examination is intended to judge the progress of students and their potential success in the program. Details concerning the make-up of the qualifying examination panel, source of questions, structure and grading of the exam may be obtained from the Department.

General Requirements begin on page 13 (Master's Degree) and 18 (Ph.D.).

Graduate students should consult with their advisor before registering for graduate work.

Biology (Bio) Course Offerings

- Bio 515 Mycology**3 F (odd years)
Comprehensive taxonomic survey of the Kingdom Fungi; reproductive biology, physiology, genetics, and ecology of fungal organisms; relationship of fungi to human affairs. Cross-listed with PS 415-515.
- Bio 515A Mycology Lab**0
- Bio 525 Biology of Aging**3 F
Physical, sensory, and physiological changes with age, aging of cells and tissues. Cellular, developmental, endocrine and other theories of aging. Pathologies of aging. P, physiology course.
- Bio 525 Biology of Aging**3 F
Physical, sensory, and physiological changes with age, aging of cells and tissues. Cellular, developmental, endocrine and other theories of aging. Pathologies of aging. P, physiology course.
- Bio 545 Histological Techniques**.....3 S
Preparation and observation of animal and plant tissues for microscopic and photomicroscopic study. Emphasis will be given to various techniques used in current research areas.
- Bio 545A Histological Techniques Lab**0
- Bio 553 Advanced Genetics**.....3 F (even years)
Procedures in genetic studies as they relate to molecular and classical genetic applications. P, Bio 371. Cross-listed with PS 453-553.
- Bio 562 Molecular Biology I**2 F
Charge, partitioning migration of molecules; protein structure, enzymes; DNA structure and properties, prokaryotic and eukaryotic conjugation, transduction and transformation; DNA replication and repair; genetic recombination; RNA structure and properties; RNA replication and repair; mRNA synthesis and processing; kinetics; chromosomes and chromosome replication. P, Micr 436, Chem 361. Cross-listed with PS 462-562.
- Bio 564 Molecular Biology II**2 S
Structure of the nucleus; endocytosis; genome of mitochondria and chloroplasts; cell growth and division; cancer; immune system; pattern formation; homeoboxes; intracellular transport; gene expression and regulation. P, Bio 462-562 or consent of instructor. Cross-listed with PS 464-564.
- Bio 565 Molecular Biology II Lab**2 S
Screening recombinant DNA libraries; DNA sequencing; analysis of proteins; detection of proteins; RNA transfer and hybridization analyses; use of nucleic acid and protein databases. P, Bio 462-562, 463-563, or consent of the instructor. Cross-listed with PS 465-565.
- Bio 567 Environmental Toxicology & Contaminants**.....3 S (even years)
This course will prepare students in the area of Ecological Effects of Toxic Substances and other contaminants. Wildlife toxicology and impacts of agriculture on the Northern Plains will be emphasized. Topics covered will include pesticides, heavy metals, aquatic and terrestrial ecotoxicity and other topics related to Wildlife Toxicology.
- Bio 580 Environmental Stress Physiology**3 S (even years)
Physiological and cellular response of plants to environmental stresses. P, Bot 327. Cross-listed with HO 480/580 and PS 480/580.
- Bio 597 Special Topics**1-5 FS
Field Ecology, Human Ecology, Mammalian Developmental Genetics.
- Bio 773 Cytogenetics**3 F (odd years)
To study the nature and behavior of chromosomes in relation to heredity. P, Bio 343 or Bio 371. Cross-listed with PS 773.
- Bio 773A Cytogenetics Lab**0
- Bio 780 Developmental Genetics**3 S
A comprehensive study of genetic mechanisms that direct and regulate fundamental processes of animal development. Topics of discussion include but are not limited to: (1) Nature of DNA and techniques of DNA analysis, (2) Transcription, and RNA processing, and (3) Molecular strategies of development in nematodea (*C. elegans*), *Drosophila*, and the mouse (*Mus musculus*). P, Bio 343, Bio 371, Zool 383, Micr 436 or equivalent of the above or consent of the instructor.
- Bio 782 Special Problems**1-4 FSSu
Independent study in specialized area of the biological sciences. Objectives, scope of work and plan of study specified by professor and student(s). P, consent of instructor and department.
- Bio 793 Biological Research Problems**1-3 FSSu

Harvie L. Hutcheson, Jr.
Professor
Ph.D., University of Oklahoma,
1965
Plant Ecology

Henry Kayongo-Male
Professor
Ph.D., Michigan State
University, 1974
Mineral Metabolism

Gary E. Larson
Professor
Ph.D., North Dakota State
University, 1979
Plant Systematics

Charles R. McMullen
Professor
Ph.D., South Dakota State
University, 1974
Plant Ultrastructure

Scott Pederson
Assistant Professor
Ph.D., University of Nebraska,
1993
Craniofacio Morphogenesis in
Bats

Gary B. Peterson
Professor
D.A., University of Northern
Colorado, 1971
Science Education

R. Neil Reese
Professor
Ph.D., University of Idaho,
1984
Plant Physiology

Raymond R. Rowland
Associate Professor
Ph.D., University of New
Mexico, 1989
Molecular Virology

John J. Ruffolo
Professor
Ph.D., University of Iowa, 1969
Developmental and Cellular
Biology

Nels Troelstrup
Associate Professor
Ph.D., University of Minnesota-
Minneapolis/St. Paul, 1992
Aquatic Ecology

Carl A. Westby
 Professor
 Ph.D., University of California-
 Davis, 1965
 Microbial Genetics

Richard H. Whalen
 Professor
 Ph.D., Purdue University, 1965
 Plant Genetics

**Adjunct/Courtesy/Joint
 Faculty**

David A. Benfield
 Professor of Veterinary Science
 Ph.D., University of Missouri-
 Columbia, 1979
 Animal Virology

Christopher Chase
 Associate Professor of
 Veterinary Science
 Ph.D., University of Wisconsin-
 Madison, 1990
 Virology/Immunology

Alan K. Erickson
 Associate Professor of
 Veterinary Science
 Ph.D., North Dakota State
 University, 1989
 Microbial Attachment

Donald P. Evenson
 Distinguished Professor of
 Station Biochemistry
 Ph.D., University of Colorado-
 Boulder, 1968
 Cellular Biochemistry

Anne Fennell
 Associate Professor of
 Horticulture, Forestry,
 Landscape and Parks
 Ph.D., University of Minnesota-
 Minneapolis/ St. Paul, 1985
 Plant Stress Physiology

David H. Francis
 Professor of Veterinary Science
 Ph.D., University of Missouri-
 Columbia, 1978
 Pathogenic Microbiology

David R. Henning
 Associate Professor of Dairy
 Science, Alfred Chair
 Ph.D., Oregon State University,
 1966
 Food Safety

Paul Johnson
 Associate Professor of Plant
 Science
 Ph.D., University of Wisconsin-
 Madison, 1992
 Insect Systematics

Biological Sciences (BioS) Course Offerings

BioS 790 Thesis	1-7 FSSu
BioS 791 Thesis Sustaining.....	0 FSSu
BioS 792 Seminar	1 FSSu
BioS 890 Dissertation—Ph.D.....	1-7 FSSu
BioS 891 Dissertation Sustaining.....	0 FSSu
BioS 892 Ph.D. Seminar	1 FS

Biology Teaching (BIST) Course Offerings

BIST 601 Biology Topics for Educators	1-12 FSSu
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This course is the hub course for the *Masters of Education; Curriculum and Instruction; Biology Content Area*, degree. It is a course with credit value depending upon the number of biology topic areas in which a student enrolls, and can be repeated as many times as desired depending upon remaining biology topic areas. BIST 601, the hub section, will meet regularly in a seminar format to enable the discussion of biology topics not included in the current specific areas of the course, as well as a forum for allowing the student to discuss and learn the interrelationship between the various topic areas. All students registered for one or more biology topic areas are required to participate in all of the hub sessions.

Botany (Bot) Course Offerings

Bot 512 Morphology of Non-Vascular Plants	1-3 F (odd years)
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A systematic survey of vascular plants that grow in wetland habitats, and a study of their adaptations to life in the water. Field and laboratory practice in identification and recognition of common aquatic plants. P, Bot 301, or consent of instructor.

Bot 512A Morphology of Non-Vascular Plants Lab	0
Bot 513 Morphology of Vascular Plants.....	3 S (even years)
Bot 513A Morphology of Vascular Plants Lab	0

Morphology has been defined as philosophical anatomy. This course addresses comparative structure and evolutionary patterns existing in the diverse vascular plant groups including club mosses, ferns, gymnosperms and angiosperms. The student will gain insight into unity from homeostasis and diversity through evolution of this group of plants.

Bot 705 Aquatic Plants	3 F (odd years)
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A systematic survey of vascular plants that grow in wetland habitats, and a study of their adaptations to life in the water. Field and laboratory practice in identification and recognition of common aquatic plants. P, Bot 301, or consent of instructor.

Bot 715 Advanced Plant Ecology	4 S
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Analysis of the energy relationships of communities with emphasis on productivity. Literature readings. Laboratory work in techniques of community analysis. P, consent.

Bot 715A Advanced Plant Ecology Lab	0
Bot 730 Plant Molecular Biology	3 F (odd years)

Molecular mechanisms involved in regulation of subcellular assemblies and metabolism in higher plants. P, Bio 343 and Chem 361 or Micr 436.

Bot 781 Plant Biotechnology	3 F (even years)
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Comparative studies in vivo and in vitro cellular differentiation, organ formation, and plant development. P, Bot 421 or Bio 371 or Bot 327.

Bot 781A Plant Biotechnology	0
Bot 782 Special Problems	1-4 FSSu

Independent study in specialized area of botanical sciences. Objectives, scope of work and plan of study specified by professor and student(s). P, consent of instructor and department.

Bot 797 Special Topics	1-5 FS
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Environmental Management (EnvM) Course Offerings

- EnvM 525 Disturbance Ecology**4 S (odd years)
 Introduction to basic concepts of disturbance ecology. Demonstration and discussion of linkages between basic biology and management of natural resources. Introduction to field and laboratory techniques for monitoring and assessment of ecological responses to pollution and other forms of disturbance. P, 153, 311.
- EnvM 525A Disturbance Ecology Lab**0 S (odd years)

Microbiology (Micr) Course Offerings

- Micr 514 Anaerobic Microbiology**3 F
 Anaerobic metabolism and ecology of bacteria, culturing techniques for anaerobic microorganisms. P, Micr 231.
- Micr 514A Anaerobic Microbiology Lab**0
- Micr 521 Soil Microbiology**3 S (even years)
 Microbial species of agricultural soils, environmental factors affecting their numbers and activity, and biochemical changes brought about by these microorganisms. P, Micr 231, or consent. Cross-listed with PS 421/521.
- Micr 521A Soil Microbiology Lab**0
 Cross-listed with PS 421A/521A.
- Micr 524 Medical and Veterinary Virology**4 S (odd years)
 Basic course discussing the characterization, structure, and replication of viruses and the pathogenesis of viral disease in man and animals. Laboratory exercises emphasize techniques in virus isolation, characterization, and detection by immunological assays. P, Micr 422 or consent. Cross-listed with Vet 424-524.
- Micr 524A Medical and Veterinary Virology Lab**0
- Micr 537 Systematic Bacteriology**4 F (even years)
 Techniques for isolation, identification, classification, and preservation of bacterial cultures are presented. Current topic areas and theory in taxonomy and nomenclature are discussed in detail. P, 231 (or equivalent).
- Micr 537A Systematic Bacteriology Lab**0
- Micr 597 Advances in Microbiology**1-4 S
 In-depth study of selected areas or specialties within Microbiology to strengthen and expand the current knowledge and technical skills of advanced undergraduate and graduate students in Microbiology. Prerequisites will vary depending upon the area studied. P, 231 and consent of instructor.
- Micr 713 Industrial Microbiology**4 F (odd years)
 A course detailing the use of microorganisms by people. Topics include the production of food and beverages, agricultural and industrial chemicals, pharmaceuticals, and alternate fuels. Legal and ethical ramifications are presented. P, Micr 332 (or equivalent) and consent. Chem 361 or equivalent is recommended.
- Micr 713A Industrial Microbiology Lab**0
- Micr 722 The Molecular and Cellular Biology of the Immune Response**3 S (even years)
 An in depth examination of the molecular and cellular basis of immune function and regulation.
- Micr 726 The Cell Physiology of Signal Transduction—
 a perspective using leukocyte models**3 S (odd years)
 A basic review of cellular physiology, membrane biology and cell signalling mechanisms in leukocyte models will be provided. The course will then examine recent primary literature to survey developments in this area.
- Micr 738 Microbial Metabolism**4 S
 A course dealing with microbial respiration of organic and inorganic compounds, anaerobic respiration, the various fermentations, photosynthesis, nitrogen fixation, and the biosynthesis of certain organic intermediates. The lab introduces the student to the usage of various research equipment. Elementary biochemistry recommended.
- Micr 738A Microbial Metabolism Lab**0

Douglas C. McFarland
 Professor of Animal and Range
 Sciences
 Ph.D., Washington State
 University, 1984
 Muscle Biology

Walter E. Riedell
 Assistant Professor of Plant
 Science
 Ph.D., Southern Illinois
 University, 1984
 Plant Physiology

Carolyn Hull Sieg
 Professor of Biology and
 Microbiology
 Ph.D., Texas Tech University,
 1991
 Fire Ecology

Bonny L. Specker
 Professor of Nutrition and
 Food Sciences
 Ph.D., University of Cincinnati
 Medical Center, 1983
 Epidemiology and Human
 Nutrition

Fedora Sutton
 Associate Professor of Plant
 Science
 Ph.D., Howard University,
 1985
 Plant Molecular Biology

Thomas P. West
 Professor of Chemistry
 Ph.D., Texas A&M University,
 1980
 Microbial Biochemistry

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation
are offered either FS or FSSu.

Course Description as written
by department and approved by
the Board of Regents.

P = Prerequisite

Micr 742 Graduate Seminar.....1 FS
Micr 782 Microbiology Problem1-4 FSSu
Independent study in specialized areas of microbiology. Objectives scope of work and plan of study specified by professor and student(s). P, consent of instructor and department.
Micr 790 Thesis1-7 FSSu
Micr 791 Thesis Sustaining0 FSSu

Zoology (Zool) Course Offerings

Zool 723 Systematic Physiology.....4
Zool 723A Systematic Physiology Lab0
Zool 782 Special Problems..... 1-4 FSSu
Zool 797 Special Topics in Zoology..... 1-5 FS
Special Topics are taught as regular courses dependent upon student demand. Information about content, prerequisites and semester offered can be obtained from the department.

Chemistry and Biochemistry

Degrees Offered:

Ph.D. Chemistry

M.S. Chemistry

Department Head: Professor James A. Rice

Graduate Coordinator: Professor James A. Rice

For additional information contact:

Mailing address: SDSU Box 2202

Shepard Hall — SH

WWW: <http://www.sdstate.edu/wchm/http/index.edu>

E-mail: James_Rice@sdstate.edu

Phone: 605/688-5154

Fax: 605/688-6364

Program Description

The research programs of the Department cover a wide range of topics. Currently active research projects in the Department focus on various aspects of analytical chemistry, organic synthesis, materials science, the chemistry and biochemistry of cell membranes, environmental chemistry, the biochemistry of animal health, nutrition and fertility, bioinorganic chemistry, computational chemistry, and solid-state NMR. The Department is equipped with modern instrumentation to support research in these areas. Most of this equipment is readily available to graduate students for "hands-on" experience after successfully completing a short training course. This equipment includes: 400 and 200 MHz solution FT-NMR spectrometers; 400 and 300 MHz wide-bore solid-state NMR spectrometers; a high-resolution magnetic sector mass spectrometer with EI and CI sources and GC, HPLC, pyrolysis and fast-atom bombardment capabilities; a FT-IR spectrometer with far-IR capabilities; near-IR reflectance scanning spectrophotometer; time-resolved spectrofluorometer; flow cytometer with cell-sorting capabilities; atomic absorption and diode-array UV-Vis spectrophotometers. In addition to these departmental resources, individual research groups also maintain their own instrumentation. Campus mainframe computer facilities and on-line computer access to Chemical Abstracts Services are readily available. Individual groups maintain their own computer systems for molecular modeling, word processing, or dedicated data manipulation.

Available Options for Graduate Degrees

Master of Science:	Option A
Doctor of Philosophy:	60-Credit Plan
	90-Credit Plan

See pages 15 (M.S.) and 18 (Ph.D.) for descriptions of available options.

Core Requirements

<i>Master of Science:</i> (<i>Chem 516 and</i> <i>4 of the 5</i> <i>courses listed</i>)	Chem 516	Chemical Communication Skills	2
	Chem 622	Advanced Organic Chemistry I	3
	Chem 632	Advanced Analytical Chemistry	3
	Chem 642	Advanced Physical Chemistry	3
	Chem 654	Advanced Inorganic Chemistry	3
	Chem 662	Principles of Biochemistry	3
<i>Doctor of Philosophy:</i> (<i>Chem 516 and</i> <i>4 of the 5</i> <i>courses listed</i>)	Chem 516	Chemical Communication Skills	2
	Chem 622	Advanced Organic Chemistry I	3
	Chem 632	Advanced Analytical Chemistry	3
	Chem 642	Advanced Physical Chemistry	3
	Chem 654	Advanced Inorganic Chemistry	3
	Chem 662	Principles of Biochemistry	3

Graduate Faculty

Jeffrey J. Elbert
Assistant Professor
Ph.D., Northwestern University,
1990
Physical Organic
Photochemistry

Donald P. Evenson
Distinguished Professor
Ph.D., University of Colorado-
Boulder, 1968
Cellular Biochemistry

John J. Fitzgerald
Professor
Ph.D., Illinois Institute of
Technology, 1972
Inorganic Chemistry/Materials
Science

John A. Grove
Professor
Ph.D., The Ohio State
University, 1966
Biochemistry

Fathi Halaweish
Assistant Professor
Ph.D., University of Wales,
1987
Natural Products/Organic
Chemistry

David C. Hilderbrand
Professor
Ph.D., University of Missouri-
Columbia, 1971
Analytical Chemistry

William P. Jensen
Professor
Ph.D., University of Iowa, 1964
Inorganic Chemistry

Rita Majerle
Associate Professor
Ph.D., University of Minnesota,
1989
Synthetic Organic Chemistry

Duane P. Matthees
Professor
Ph.D., University of Maryland-
College Park, 1978
Analytical Chemistry

James A. Rice
Professor
Ph.D., Colorado School of
Mines, 1987
Environmental
Geochemistry/Analytical
Chemistry

Harrell Sellers
Professor
Ph.D., Arkansas State
University, 1979
Physical/Computational
Chemistry

Igor Sergeev
Assistant Professor
Ph.D., Institute of Biomedical
Problems (Russia), 1984;
D.Sc., Institute of Nutrition
(Russia), 1991;
Cellular Biochemistry

Jay S. Shore
Associate Professor
Ph.D., University of Illinois at
Champaign-Urbana, 1992
Physical Chemistry/Solid-state
NMR

Ronald E. Utecht
Professor
Ph.D., Iowa State University of
Science and Technology, 1986
Bioinorganic Chemistry

Thomas West
Professor
Ph.D., Texas A&M University,
1980
Biochemistry

Adjunct/Courtesy/Joint Faculty

Royce Engstrom
Professor at University of South
Dakota
Ph.D., University of Wisconsin-
Madison, 1979
Chemistry

Henry Kayongo-Male
Professor of
Biology/Microbiology
Ph.D., Michigan State
University, 1974
Trace Element Biochemistry

Douglas C. McFarland
Professor of Animal and Range
Sciences
Ph.D., Washington State
University, 1984
Biochemistry

Additional Admission Requirements

GRE: General & subject score are recommended but not required.

TOEFL: Department requirement of 580*

*The TSE score is recommended for international students seeking an assistantship.

General Requirements begin on page 13 (Master's Degree) and 18 (Ph.D.).

Graduate students should consult with their advisor before registering for graduate work.

Chemistry (Chem) Course Offerings

(if not listed, see department for schedule of offerings)

Chem 516 Chemical Communication Skills2 Su
Searching chemical literature by traditional and computer assisted methods; techniques of written and oral communication of chemical information.

Chem 622 Advanced Organic Chemistry I3 F
Review and discussion of nomenclature, stereochemistry, resonance theory, equilibria, elementary kinetics, intermediate and mechanisms. Chemistry of polymers, heterocyclics, and natural products. P, Chem 328, Chem 344.

Chem 632 Advanced Analytical Chemistry3 S
Theoretical treatment of principles involved in noninstrumental analytical chemistry including sampling and statistics. P, Chem 344.

Chem 642 Advanced Physical Chemistry3 F
A review of the principles and applications of physical chemistry. Topics such as thermochemistry, quantum mechanics, spectroscopy, kinetics, and electrochemistry considered. P, Chem 344.

Chem 654 Advanced Inorganic Chemistry3 F
Inorganic systems including theoretical, representative group and transition metal topics. P, Chem 344 or Chem 352.

Chem 662 Principles of Biochemistry3 F
Chemistry of biological processes occurring in plants and animals. P, Chem 361.

Chem 691 Special Problems1-4 FS
P, consent, Limited to a total of 4 credits.

Chem 720 Special Topics in Organic Chemistry1-6
One term, advanced courses taught upon demand and covering such topics as stereochemistry, advanced synthetic organic chemistry, etc. P, consent.

Chem 722 Synthesis of Natural Products3
Synthetic strategies and pathways for the formation of natural products. P, Chem 328.

Chem 724 Structural Determination of Organic Compounds3 (alternate years)
Determination of the structure of organic compounds primarily by spectroscopic techniques. P, Chem 328.

Chem 724A Structural Determination of Organic Compounds Lab0

Chem 725 Polymer Chemistry4
The chemistry of high molecular-weight polymeric molecules will be discussed. The laboratory will consist of the preparation, reactions, and properties of select polymers. P, Chem 328.

Chem 725A Polymer Chemistry Lab0

Chem 726 Advanced Organic Chemistry II3 (alternate years)
Physical organic, reaction mechanisms, M.O. calculations, orbital symmetry, and E.S.R. spectroscopy. P, Chem 328 and Chem 344.

Chem 728 Bioorganic Chemistry3
Interpretation and categorization of biochemical reactions in terms of principles of organic chemistry. Synthesis of biologically active macromolecules and models for enzyme catalysis. P, Chem 224, Chem 662.

Chem 730 Special Topics in Analytical Chemistry1-6
Individualized studies in mass spectrometry, electroanalytical, trace analysis, or instrumentation and electronics, P, consent.

Chem 732 Analytical Ag and Environmental Chemistry	4
The principles of analytical chemistry as applied to agricultural environmental chemistry will be presented in the lecture portion of the course and the performance of those procedures will be presented in the laboratory section of the course. P, Chem 434.	
Chem 732A Analytical Ag and Environmental Chemistry Lab	0
Chem 734 Analytical Spectroscopy	3 (alternate years)
In-depth treatment of the quantitative applications and theory of modern spectroscopy techniques including atomic absorption, emission, and fluorescence; molecular absorption and fluorescence; and X-ray spectroscopy. P, Chem 434.	
Chem 736 Chromatography and Separations	3 (alternate years)
Theory and practice of solvent extraction and paper, thin layer, gas and liquid chromatographic techniques. P, Chem 232.	
Chem 738 Electroanalytical Chemistry	3
The principles of electrochemistry as applied to analytical methods will be presented in this course. Topics covered will include polarography, potentiometry, conductance, coulometry, and related topics. P, Chem 434.	
Chem 740 Special Topics in Physical Chemistry	1-6
One-term, advanced courses taught upon demand covering such topics as electrochemistry, surface chemistry, kinetics, quantum chemistry, etc. P, consent.	
Chem 741 Quantum Chemistry I	3 (triennial years)
The application of wave mechanics to simple atomic and molecular systems, properties of wave functions, and approximate methods. P, Chem 642, Math 321.	
Chem 742 Quantum Chemistry II	3 (triennial years)
Continuation of Chem 741. P, Chem 741.	
Chem 744 Chemical Thermodynamics	3 (alternate years)
Discussion of the laws and theories of classical and statistical thermodynamics as related to macroscopic chemical systems. P, Chem 344.	
Chem 745 Statistical Thermodynamics	3 (triennial years)
Fundamental principles of statistical thermodynamics with applications to chemical systems. P, Chem 642, Chem 744.	
Chem 746 Atomic and Molecular Structure	3 (alternate years)
Introduction to quantum mechanics and theoretical treatment of chemical structure and binding. P, Chem 328, Chem 344, or concurrent registration in Chem 344.	
Chem 748 Chemical Kinetics	3 (triennial years)
Experimental methods and theoretical approaches to the study of reaction rates. P, Chem 328, Chem 344.	
Chem 750 Special Topics in Inorganic Chemistry	1-6
One-term, advanced courses taught upon demand and covering such topics as coordination chemistry of transition elements, structural determinations, etc. P, consent.	
Chem 752 Descriptive Inorganic Chemistry	3 (alternate years)
Discussion centered on periodic relationships of the elements. The laboratory work includes preparation and purification of typical inorganic compounds. P, Chem 120 (4 credits), Chem 232, Chem 352.	
Chem 752A Descriptive Inorganic Chemistry Lab	0
Chem 753 Organometallic Chemistry	3
The study of metal compounds containing organic moieties and related inorganic compounds. Major emphasis will be focused on transition metal-carbon compounds such as the carbonyls, aromatic hydrocarbons and nonaromatic olefin and acetylene complexes. Homogenous catalysts will be discussed. P, Chem 352.	
Chem 754 Physical Methods of Inorganic Chemistry	3
The study of instrumental methods and spectral interpretation used to investigate inorganic compounds. EPR, X-ray, NMR, UV-Vis and IR will be discussed. P, Chem 344, Chem 352.	
Chem 760 Special Topics in Biochemistry	1-6
One-term, advanced courses taught upon demand and covering a variety of topics. P, consent.	
Chem 764 Biochemistry I	3 (alternate years)
Study of metabolism of carbohydrates and lipids. Includes aspects of enzyme kinetics and regulation as well as principles and characteristics of ATP-synthesizing complexes. P, Chem 662.	

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Key to Course Descriptions

Course Number & Name
 Credits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Chem 766 Biochemistry II3 (alternate years)
 Study of the metabolism of amino acids, proteins, nucleotides and nucleic acids. Includes some aspects of enzymology and the mechanism of intra and intercellular communication. P, Chem 662.

Chem 767 Biophysical Chemistry3
 Discussion of the theoretical and practical aspects of biophysical methods. These will include an examination of electrophoresis, centrifugation, light scattering, optical rotary dispersion, X-ray diffraction, viscosity/diffusion, and spectroscopy. P, Chem 340, Chem 662.

Chem 768 Plant Biochemistry3
 Chemistry of structural and functional elements of plants with special emphasis on bioenergetics, photosynthesis, nitrogen fixation, sulfur metabolism, carbohydrate interconversion, secondary plant products, seed development and fruit ripening, and genome expression. P, Chem 662.

Chem 769 Nutritional Biochemistry3
 Study of the biochemistry of systems that are significant in nutrition including metabolism, requirements and deficiencies.

Chem 772-773 Seminar1 FS
 Required of all graduate majors in chemistry.

Chem 781 Bioinorganic Chemistry3 (alternate years)
 A study of biological systems stressing the role of metals ions, primarily the transition metals. Model systems included in the discussion. P, Chem 120 (4 credits), Chem 352 or consent.

Chem 782 Radioisotope Techniques4 S
 Theory and measurement of radioactivity. Techniques for the application of radioactive isotopes in chemical and biological experimentation. P, consent.

Chem 782A Radioisotope Techniques Lab.....0

Chem 790 Thesis1-7

Chem 791 Thesis Sustaining (M.S.).....0

Chem 890 Dissertation (Ph.D.)1-12

Chem 891 Dissertation Sustaining (Ph.D.)0

Chemistry Teaching (CHST) Course Offerings

CHST 601 Chemistry Topics for Educators1-12 FSSu
 This course is the hub course for the *Masters of Education; Curriculum and Instruction; Chemistry Content Area*, degree. It is a course with credit value depending upon the number of chemistry topic areas in which a student enrolls, and can be repeated as many times as desired depending upon remaining chemistry topic areas. CHST 601, the hub section, will meet regularly in a seminar format to enable the discussion of chemistry topics not included in the current specific areas of the course, as well as a forum for allowing the students to discuss and learn the interrelationship between the various topic areas. All students registered for one or more chemistry topic areas are required to participate in all of the hub sessions.

Physics (Phys) Course Offerings

The following Physics courses may be used in the graduate major plan of study. (See complete descriptions under Department of Physics.)

Phys 743 Statistical Mechanics2

Phys 775 Tensors & General Relativity3

Phys 779 Group Theory in Quantum Mechanics3

Civil and Environmental Engineering

Degree Offered:

M.S. Engineering

- Civil Engineering coursework concentration

Department Head: Professor Vernon R. Schaefer

Graduate Coordinator: Professor Delvin DeBoer

For additional information contact:

Mailing address: SDSU Box 2219

Crothers Engineering Hall — CEH

WWW: <http://www.engineering.sdstate.edu>

E-mail: Delvin_DeBoer@sdstate.edu

Phone: 605/688-5427

Fax: 605/688-5878

Program Description

Courses, design, and research activities within Civil and Environmental Engineering are related to structural, transportation, geotechnical, water resources, hydrology, hydraulics and environmental engineering as well as engineering mechanics. These are supportive of the Master of Science in Engineering.

Core Requirements

Students in CEE must register and pass CEE 700 (Seminar, 0 cr.) all semesters in residence except when enrolled in CEE 701 (Seminar, 1 cr.) (2 credits required).

Refer to College of Engineering section, pages 78-80, for specific details.

Additional Admission Requirements

GRE: Not required

TOEFL: Civil and Environmental Engineering requirement of 525

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Civil and Environmental Engineering (CEE) Course Offerings

CEE 511 Bituminous Materials	3 F (alternate years)
Properties of bituminous materials including their compatibility with various types of aggregates. Asphalt mixes are designed and tested. Standards tests are performed on bituminous materials with emphasis on test results. Asphalt surface evaluation techniques. P, 216.	
CEE 511A Bituminous Materials Lab	0
CEE 524 Industrial Waste Treatment	2 S
Characteristics and composition of industrial wastes, sampling and methods of analysis of these wastes and remedial measures for treatment and disposal. P, 423 or consent.	
CEE 527 Environmental Engineering Instrumentation	3 F
Analysis of water and waste water samples, using environmental laboratory instrumentation. Design of treatment facility process instrumentation and controls. P, 423 or consent.	
CEE 527A Environmental Engineering Instrumentation Lab	0
CEE 528 Solid Waste Engineering and Management	3 S
Solid waste regulation and characterization. Design of disposal facilities, management of collection, transport, transfer, storage and disposal systems. Field trips to various disposal facilities required. P, 446.	
CEE 528A Solid Waste Engineering and Management Lab	0

Graduate Faculty

Suzette Burckhard
Assistant Professor
Ph.D., Kansas State University,
1997
Environmental Engineering and
Water Resources Engineering

Delvin DeBoer
Professor
Ph.D., Iowa State University,
1990
Environmental Engineering

Richard A. Reid
Associate Professor
Ph.D., Georgia Institute of
Technology, 1995
Geotechnical/Transportation
Engineering

Vernon Schaefer
Professor
Ph.D., Virginia Polytechnic
Institute and State University,
1987
Geotechnical/Geoenvironmental
Engineering

Christopher G. Schmit
Assistant Professor
Ph.D., Iowa State University,
1977
Environmental Engineering

Ali A. Selim
Professor
Ph.D., University of Missouri-
Rolla, 1976
Transportation Engineering

Arden B. Sigl
Professor
Ph.D., Northwestern University,
1977
Structural Engineering

Francis C.K. Ting
Associate Professor
Ph.D., California Institute of
Technology, 1989
Fluid Mechanics/Hydraulic
Engineering

CEE 535 Water Resources Engineering	3 S
Topics related to water resources engineering including: multiple purpose river development, economic analysis of flood control measures, aspects of water law, advanced topics related to surface and ground water hydrology and administrative aspects of water resources planning. P, 433.	
CEE 536 Foundation Engineering.....	3
Bearing capacity, load induced pressures and settlements, soil exploration and sampling, lateral-earth pressure, retaining walls, sheet pile structures, pile formations and caissons. P, 446.	
CEE 536A Foundation Engineering Lab	0
CEE 543 Matrix Analysis of Structures	3
Theory and application of matrix methods in structural analysis. P, 353.	
CEE 544 Precast Concrete Structures.....	3 (alternate years)
Advantages of precast concrete. Structural and architectural precast elements. Building systems. Design concepts and structural design. Connections, specifications, and detailing. P, 456.	
CEE 547 Advanced Geotechnical Engineering	3
Development of a fundamental understanding of engineering properties of soils and the factors controlling their magnitude and changes with time and environment. Development of why this knowledge is important and how it can be used in the solution of geotechnical and geoenvironmental problems.	
CEE 552 Prestressed Concrete	3
Theory and design of prestressed concrete including pre-tensioning and post-tensioning. P, 456.	
CEE 559 Advanced Structural Mechanics.....	3 S (alternate years)
Review of principal moments of inertia; relationship of plain stresses and strains; use of rosettes; shear center; unsymmetrical bending; theories of failure; curved beams and closed rings; thick-walled cylinders; beams on continuous elastic support, miscellaneous topics in structural analysis. P, 353.	
CEE 559A Advanced Structural Mechanics Lab	0
CEE 572 Geosynthetics	3 F
Detailed study of the types of geosynthetic materials used in environmental, geotechnical, and transportation engineering as well as how they are used and manufactured. Particular emphasis will be placed on erosion control, landfill, transportation, drainage, filtration and reinforcement applications. P, CEE 336.	
CEE 593 Special Topics	1-3 FSSu
P, consent.	
CEE 623 Advanced Sanitary Engineering	3 (alternate years)
Advanced engineering topics related to sanitary engineering and public health, including housing, air conditioning and ventilation, air pollution, hospital and institutional sanitation, stream sanitation, waste disposal, radiological health and industrial hygiene.	
CEE 625 Environmental Engineering Planning	3 S (alternate years)
Analysis and review of basic concepts and procedures involved in environmental aspects of planning. Consideration given to local effects of projects as well as effects on the area and the state or region. P, Graduate standing or consent.	
CEE 632 Advanced Foundation Engineering	3 (alternate years)
Advanced treatment of foundations and earth retaining structures. Bearing capacity, lateral resistance and settlement of deep foundations; earth pressures on sheet pile walls, braced excavations and buried pipes; numerical methods and computer use in design and analysis applications. P, CEE 547.	
CEE 632A Advanced Foundation Engineering Lab	0
CEE 633 Open Channel Hydraulics.....	3 F (alternate years)
Energy and momentum principles in open channel flow, flow resistance, flow in uniform and non-uniform channels, flood routing, P, CEE 433.	
CEE 634 Fluvial Hydraulics	3 S (alternate years)
Erosion, transportation and deposition of sediments by flowing water, bed load and suspended load movement, river behavior and control. P, CEE 433.	
CEE 639 Geotechnical Testing	3 (alternate years)
Determination of engineering properties of soils. Measurement of stress-strain behavior, compressibility, permeability. Use of direct shear test, triaxial compression test, consolidation test, permeameter tests. Interpretation of test data for engineering applications. Use of computerized data acquisition methods. P, CEE 446.	

CEE 639A Geotechnical Testing Lab	0
CEE 654 Advanced Design of Steel Structures.....	3 (alternate years)
Design of slender compression elements tapered members, hybrid plate girders, column base plates subjected to bending moments, bolted and welded connections. Cold form steel structures. P, CEE 455.	
CEE 656 Advanced Reinforced Concrete Design	3 (alternate years)
Design of rigid frames, effect of plastic behavior, details for complex structures, analysis of flat plate and other two-way floor systems. Design comparisons. P, CEE 456.	
CEE 664 Highway Capacity Analysis.....	3 S (alternate years)
Sizing road segments in terms of number of lanes based on traffic volume and level of service. Eliminating traffic conflict on road sections and intersections. Vehicle and pedestrian analysis. P, CEE 363.	
CEE 693 Special Topics	1-3 FSSu
CEE 700-701 Seminar	0-1
Current, state-of-the-art, topics in civil engineering.	
CEE 721 Environmental Engineering	3 (alternate years)
The relationship of man's environment to health and control of this environment from an engineering standpoint. P, consent.	
CEE 722 Hazardous/Toxic Waste Disposal.....	3 (alternate years)
Legislation, regulation, business aspects and technology related to the management and disposal of hazardous and toxic wastes. P, consent.	
CEE 722A Hazardous/Toxic Waste Disposal Lab	0
CEE 724 Land Treatment of Wastes	3 (alternate years)
State-of-the-art planning and process design of land treatment systems for the disposal of municipal, industrial, and agricultural wastes. Physical, chemical and biological limiting factors with emphasis on site selection and process feasibility. Land disposal of sludges.	
CEE 724A Land Treatment of Wastes Lab	0
CEE 725 Biological Principles of Environmental Engineering	3
Ecology, energetics and kinetics of biochemical systems. Analysis and modeling of suspended growth and fixed film biological processes used in environmental engineering. Laboratory procedures for developing biokinetic data. P, CEE 423 or consent.	
CEE 725A Biological Principles of Environmental Engineering Lab	0
CEE 726 Physical/Chemical Principles in Environmental Engineering	3
Fundamental concepts of fluid/particle interactions, process kinetics, and equilibrium chemistry applied to natural and engineered aquatic environmental systems. Coagulation, fluid/particle separation, oxidation/reduction, precipitation/dissolution, carbonate systems, adsorption, ion exchange, and gas/liquid interfaces. P, CEE 423 or consent.	
CEE 726A Physical/Chemical Principles in Environmental Engineering Lab.....	0
CEE 727 Water Treatment Plant Design.....	3 F (alternate years)
Water supply sources, design of treatment plants, cost estimates of water supply systems. P, CEE 327 or consent.	
CEE 727A Water Treatment Plant Design Lab.....	0
CEE 728 Waste Water Treatment Plant Design	3 S (alternate years)
Design of waste collection and disposal facilities, waste treatment plants, cost estimates of waste disposal and treatment systems. P, CEE 423; graduate standing.	
CEE 728A Waste Water Treatment Plant Design Lab.....	0
CEE 733 Advanced Water Resources Engineering	3 S (alternate years)
Advanced topics related to water resources engineering including: Multiple purpose river development, economic analysis of flood control measures, aspects of water law, advanced topics related to surface and ground water hydrology and administrative aspects of water resources planning. P, CEE 435/535.	
CEE 734 Surface Water Quality Modeling.....	3 (alternate years)
Modeling advective and dispersive mass transport in surface and engineered water systems. Analysis of reactions affecting the fate of dissolved oxygen, nutrients, toxic compounds and pathogens. Analytical and numerical solutions to deterministic modeling equations. Application and use of the QUALI-III and EPANET models. P, CEE 423, Math 321.	

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Key to Course Descriptions

Course Number & Name
 Credits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

Courses with no FSSu notation
 are offered either FS or FSSu.

Course Description as written
 by department and approved by
 the Board of Regents.

P = Prerequisite

CEE 737 Hydraulic Design	3 F (alternate years)
Hydraulic design as applied to hydroelectric power development and turbine design, flood routing in reservoirs and natural channels, design of drainage structures, and energy dissipators. P, CEE 433; graduate standing.	
CEE 738 Advanced Hydraulics.....	3 S (alternate years)
Introduction to topics related to water resources engineering including: dimensional analysis, similitude, mechanics of sediment transport, river engineering, coastal hydraulics and stream channel mechanics. P, CEE 433; graduate standing.	
CEE 738A Advanced Hydraulics Lab.....	0
CEE 749 Structural Dynamics	3 (alternate years)
Dynamic analysis of structural system with one and several degrees of freedom. Determination of natural frequencies. Analysis of free and forced vibration systems including damping. Introduction to earthquake engineering. P, CEE 353, CEE 456.	
CEE 756 Reinforced Masonry Design	3 (alternate years)
Development of masonry construction. Material properties. Structural design of loadbearing walls, columns, beams and shear walls. Design of masonry buildings due to gravity loads, lateral forces and earthquakes. P, CEE 456.	
CEE 762 Pavement Management and Rehabilitation	3 F (alternate years)
Assessment of road networks to determine maintenance rehabilitation needs. Rehabilitation strategies for various types of pavements. Prioritization schemes for road section repair. P, CEE 467, CEE 765, or concurrent.	
CEE 762A Pavement Management and Rehabilitation Lab	0
CEE 765 Pavement Design	3 S (alternate years)
Stresses in and design of flexible and rigid pavements including subgrades, bases and sub-bases. P, CEE 363.	
CEE 765A Pavement Design Lab	0
CEE 769 Design of Steel and Concrete Bridges	3 (alternate years)
Determination of bridge loadings and bearings. Design of concrete and steel bridge systems. Specifications and detailing related to bridge. P, CEE 455, CEE 456.	
CEE 770 Engineering Research or Design Paper.....	1-2
Conduct a research or design project and write a report on the work done using thesis format.	
CEE 790 Thesis	1-7 FSSu
CEE 791 Thesis Sustaining	0 FSSu
CEE 792 Special Engineering Problems	1-3 FS
CEE 793 Special Topics.....	1-3
CEE 795 Engineering Research or Design Paper Sustaining.....	0
CEE 797 Research	1-9

Communication Studies and Theatre

Degree Offered:

M.S. Communication Studies and Journalism (*See also Journalism*)

Department Head: Professor Michael Schliessmann
Graduate Coordinator: Associate Professor Laurie L. Haleta

For additional information contact:

Mailing address: SDSU Box 2218

Pugsley Center — PC

WWW: <http://www.sdstate.edu/cst>

E-mail: Michael_Schliessmann@sdstate.edu

Phone: 605/688-6131

Fax: 605/688-6551

Program Description

The Master of Science program in Communication Studies and Theatre is designed to provide advanced studies in the area of public address, rhetorical theory, radio/television studies, and theatre arts. It provides further professional preparation and competencies in the area of communication.

Available Options for Graduate Degrees

Master of Science: Option A: Communication Studies

OR

Journalism

Option Descriptions

Communication Studies – Designed to provide advanced studies in the areas of public address, rhetorical theory, radio/television studies, and theatre arts. This option provides further professional preparation and competencies in the area of communication.

Journalism – Designed to provide for professional journalists who wish to broaden their education in communication and social sciences; and for individuals with undergraduate degrees in non-journalism specialties who wish to develop their knowledge in mass communication.

See page 15 for descriptions of available options.

Core Requirements

RTVF 792 Research Methods in Communication (taken by second semester)

SPCM 700 Instructional Methods in Communications
(for Graduate Teaching Assistants)

GCom 605 Current Approaches to Communication

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525

Master of Science: Minimum of 20 semester hours of undergraduate credit in Speech, Theatre, Journalism, or Communication. Other undergraduate programs *may* qualify.

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Graduate Faculty

J.D. Ackman
Associate Professor
M.F.A., University of Montana,
1984
Theatre Performance Studies

Jerry Ferguson
Professor
Ph.D., Southern Illinois
University-Carbondale, 1973
Interpersonal Communication

Laurie Haleta
Associate Professor
Ph.D., University of Nebraska,
1994
Instructional Communication

James L. Johnson
Professor
Ph.D., University of Kansas,
1973
Theatre Studies, Rhetoric

Jerry Jorgensen
Professor
Ph.D., University of Nebraska,
1990
Media Studies, Organizational
Communication

Michael Schliessmann
Professor
Ph.D., University of Kansas,
1981
Public Address, Rhetorical
Criticism

James Tallmon
Associate Professor
Ph.D., University of
Washington, 1993
Rhetorical Theory

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

General Communication (GCom) Course Offerings

- GCom 605 Current Approaches to Communication**3 S
Major theories of communication, including media and interpersonal communication.
- GCom 793 Special Topics in Communication**1-3 FSSu

Radio, Television, and Film (RTVF) Course Offerings

- RTVF 537 Educational & Corporate TV**3 (offered on demand)
Educational broadcasting with practical work in preparation and presentation of educational and instructional materials for radio, TV, and film and their use in the classroom. Cross-listed with MCom 437-537.
- RTVF 564 Film Studies**3 (alternate years)
Film art forms, artists and critics. Viewing and making films. Emphasis on major film theories.
- RTVF 762 Special Problems in Radio, TV, or Film** 1-2 FSSu
- RTVF 792 Research Methods in Communications**3S
Research Methods in Communication under Department of Journalism and Mass Communication.

Speech Communication (SpCm) Course Offerings

- SpCm 516 Rhetorical Criticism**3 F (alternate years)
Critical evaluation of American speakers from Colonial to contemporary. P, consent.
- SpCm 552 General Semantics**3 F (alternate years)
Relations between symbols; human behavior in reaction to symbols including unconscious attitudes, linguistic assumptions; and the objective systematization of language. Cross-listed with Ling 452-552.
- SpCm 700 Instructional Methods in Communication**3 F
Problems and issues in teaching the basic communication course, development of communication courses, and issues relevant to communication education.
- SpCm 707 Speech/English/Drama for Teachers** 1-3
Designed to help teachers develop curriculum materials and curricular/co-curricular instruction of literature and drama.
- SpCm 766 Rhetorical Theory**3 F (alternate years)
Historical development of rhetorical theory from classical to modern times.
- SpCm 790 Thesis** 1-7 FSSu (Pass/Fail)
- SpCm 791 Thesis Sustaining** 0 (Pass/Fail)
- SpCm 792 Special Problems in Oral Interpretation** 1-2 FSSu
Directed research. May be repeated to a total of 4 credits in problems courses. P, consent.
- SpCm 794 Special Problems in Public Address**1-2 FSSu
Directed research. May be repeated to a total of 4 credits in problems courses. P, consent.

Theatre (Thea) Course Offerings

- Thea 510 Dramatic Literature** 3 F (alternate years)
Analysis of important drama through present day.
- Thea 560 History of Theatre** 3 S (alternate years)
Periods, theatres, and representative dramatic literature from the classical to the present day.
- Thea 792 Special Problems** 1-2 FSSu
Directed research; may be repeated to total of 4 credits in problems courses. P, consent.

Computer Science

Degree Offered:

M.S. Engineering

- Computer Science coursework concentration

Acting Department Head: Lewis Brown

Graduate Coordinator: Associate Professor Sung Shin

For additional information contact:

Mailing address: SDSU Box 2201

Administration — AD

WWW: <http://www.engineering.sdstate.edu/~compsci/>

E-mail: lewis_brown@sdstate.edu

Phone: 605/688-5719

Fax: 605/688-5878

Program Description

The Department of Computer Science offers coursework supportive of the Master of Science in Engineering. The purpose of this coursework is to support the M.S. in Engineering and provide opportunities for those students who wish to pursue further education and career opportunities with strong backgrounds in software, hardware, and related management areas in the computer industry. Students should clearly understand that the degree pursued is a Master of Science in Engineering and not a Master of Science in Computer Science.

Computer Science Core Requirements

CSc 705 Design and Analysis of Computer Algorithms	3
CSc 710 Structure and Design of Programming Languages.....	3
CSc 720 Theory of Computation.....	3
CSc 770 Software Engineering Management.....	3

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525

Refer to College of Engineering section, pages 78-80, for specific details.

Computer Science (CSc) Course Offerings

CSc 572 Artificial Intelligence3 Su
Introduction to ideas, issues and applications of Artificial Intelligence. Knowledge representation, problem solving, search, inference techniques, theorem proving. Expert systems. Artificial intelligence programming languages. P, 290.

CSc 574 Computer Networks3 S
Analysis of current and future computer networks with emphasis on the OSI model. Local and wide area networks. TCP/IP, SNA, token ring, ethernet and other common networks will be covered. Protocol and interfaces within and across networks including the OSI layers, routers, bridges and gateway. P, 285, Math 381 or Stat 341.

CSc 576 Computer Graphics3 F
Principles of computer graphics. A study of the algorithms used to generate raster and vector graphics. P, 285, Math 215 and 224.

CSc 593 Special Topics in Computer Science1-3
Individualized problems determined by mutual agreement between instructor and student. Programming language optional. P, consent of department head.

CSc 630 Principles of Data Base System Design3
Fundamental concepts. Physical data organization. Data models. Data Manipulation languages. Data base design. Application of data base concepts in design and development of data base systems and applications. Design of current commercial as well as research oriented data base systems. Techniques of using data base systems for application security and integrity. Performance evaluation. P, CSc 484.

Graduate Faculty

Ali Salehnia

Professor

Ph.D., University of Missouri-Columbia, 1989

Information Systems

Sung Y. Shin

Associate Professor

Ph.D., University of Wyoming, 1991

Software Engineering

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

CSc 643 System Analysis and Design	3
Advanced theory and practice of systems analysis. Life cycle concept of information system development. Covers HIPO charts, dataflow analysis, Nasis-Schneiderman charts, decision tables, structured walkthroughs, PERT and CPM, computer selection and evaluation. Modular design and the use of a computer aided software engineering (CASE) tools in the completion of an analysis and design project are also emphasized. P, CSc 325, or consent of instructor.	
CSc 700-701 Seminar	0-1
Current state-of-the-art topics in Computer Science. P, permission of instructor.	
CSc 705 Design and Analysis of Computer Algorithms	3 S
Design and analysis of algorithms to determine their time and space requirements. The study of efficient algorithms for various computational problems. Analysis of specific algorithms for internal sorting, hashing, and string search. Sorting manipulation of data structures, graphs, matrix multiplication, the Fast Fourier Transform, arithmetical operations and pattern matching. Study and implication of advanced topics on lists, stacks, trees, sets and dynamic allocation. P, CSc 285.	
CSc 710 Structure and Design of Programming Languages.....	3 F
Evolution of concepts in programming languages. Data and control abstraction. Run-time effects of binding, scope and extent; structure of ALGOL-like and interpretive languages. Data types, problem areas and implementation models. Control structures, exception handling, concurrency. Functional programming. Examples from representative languages. P, CSc 290.	
CSc 720 Theory of Computation	3 S
Formal models of computation. Recursive function theory, computable functions, decidable and enumerable sets, unsolvable programs, correctness of programs, undecidability and incompleteness and complexity of computation. P, CSc 328.	
CSc 740 Management Information Systems.....	3
Computer appreciation course providing technical background for understanding and raising issues treated in other courses. Structure and operation of computer systems. Hardware technology and software development. Tools and methods for developing computer applications. Structure and components of Management Information Systems. Using the computer to support operations of management in planning and control and decision making. MIS development, organization, management and evaluation. Acquiring computer resources. The computer industry and profession. P, CSc 325.	
CSc 750 Recent Advances in Parallel Processing	3
A survey of topics related to the architecture of highly parallel machines, programming and algorithms. Pipelined computers, associative machines, array processors. Interconnection networks. Parallel algorithms. P, CSc 705.	
CSc 770 Software Engineering Management	3 F
Management issues arise in the development of software systems. The topics include planning documentation for requirements, design, implementation and testing, cost projection and modeling, documentation standards, code control, tracking of defects management psychology, group interaction and communication, and the management of reviews and walkthroughs. P, CSc 470, or consent of instructor.	
CSc 790 Thesis	1-7
CSc 791 Thesis Sustaining.....	0
CSc 792 Research Report/Design Paper	1-2
Conduct an approved research or design project and complete an approved research report or design paper in Computer Science.	
CSc 793 Special Topics in Computer Science.....	1-2
Individual topics determined by mutual agreement between the instructor and the student. Programming language optional. P, consent of Department Head.	
CSc 794 Special Problems in Computer Science	1-3 (max 6)
Independent study in specialized areas of computer science. Problems for advanced study selected according to students' specific interests, needs, or current research. Maximum of 6 credits. P, consent of instructor.	
CSc 795 Computer Science Research or Design Paper Sustaining	0
CSc 797 Research	1-9 (repeatable P/F)
Individualized research. Repeatable P/F. Credits cannot be used on Plan of Study. P, consent.	

Counseling and Human Resource Development

Degree Offered:

M.S. Counseling and Human Resource Development

Department Head: Professor Francis A. Martin

Graduate Coordinator: Professor Francis A. Martin

For additional information contact:

Mailing address: SDSU Box 507

Wenona Hall — WEN

WWW: <http://www.sdstate.edu/~wedc/http/cec.htm>

E-mail: Francis_Martin@sdstate.edu

Phone: 605/688-4190

Fax: 605/688-6074

Program Description

The Counseling and Human Resource Development program is designed to assist the student in developing professional skills and competencies expected of qualified counselors in school, agency or higher education settings. These include, but are not limited to: 1) intervention and assessment strategies appropriate for master's level counselors, 2) individual and group counseling competencies, 3) professional responsibility, and 4) self-knowledge and self-development.

Available Options for Graduate Degrees

Master of Science: Option A
 Option B
 Option C

See page 15 for descriptions of available options.

Core Requirements

EdER 761	Research and Writing.....	3
CHRD 601	Introduction to Counseling	3
CHRD 610	Developmental Issues in Counseling.....	3
CHRD 661	Theories of Counseling.....	3
CHRD 736	Appraisal of the Individual	3
CHRD 742	Career Counseling and Planning	3
CHRD 766	Group Counseling	3
CHRD 786	Pre-Practicum.....	3
CHRD 787	Counseling Practicum	3

Additional Requirements

The following courses are required for the respective areas of emphasis:

Counseling in an Agency Setting

CHRD 723	Counseling the Family.....	3
CHRD 755	Clinical Diagnosis & Treatment Planning.....	3
CHRD 789	Counseling Internship: Agency Setting.....	6

Counseling in a School Setting

CHRD 603	School Counseling	3
CHRD 722	Administration and Management of School Counseling Programs	3
CHRD 755	Clinical Diagnosis & Treatment Planning.....	3
OR		
CHRD 723	Counseling the Family.....	3
CHRD 789	Counseling Internship: School Setting	6

Graduate Faculty

Mark Britzman
Associate Professor
Ed.D., University of South
Dakota, 1987
Community Counseling

Ruth Harper
Associate Professor
Ph.D., Kansas State University,
1987
Student Affairs Setting

John V. Jones, Jr.
Assistant Professor
Ph.D., University of North
Texas, 1996
Community Counseling

Dianna Knox
Assistant Professor
Ed.D., University of South
Dakota, 1998
Community Counseling

Francis A. Martin
Professor
Ph.D., Southern Baptist
Theological Seminary, 1973
Community Counseling

Marla Muxen
Professor
Ph.D., University of Minnesota-
Minneapolis/ St. Paul, 1990
Community Counseling

Jay Trenhaile
Assistant Professor
Ed.D., University of South
Dakota, 1998
School Counseling

Nona L. Wilson
Associate Professor
Ph.D., Ohio University, 1993
Community Counseling

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Counseling in a Student Affairs Setting

CHRD 770	Student Development: Theory and Practice	3
CHRD 771	Student Personnel Services	3
CHRD 772	Administration & Leadership in Student Affairs	3
CHRD 789	Counseling Internship: Student Personnel	6

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Requirements for Admission to the Program

Step 1

Acceptance by the Graduate School. (*see page 6 for additional information*)

If accepted to the Graduate School, those seeking admittance to the Counseling and Human Resource Department will be given a "Special Student Status." The Graduate School Bulletin states that a student given this status may not receive Graduate Assistantships, financial aid, or enroll for thesis/dissertation credits. The Graduate Dean will act as advisor for these students.

No more than ten credits under Special Student status may be applied toward a degree. The last statement is important in that it will limit the number of credits you can take in our department before being formally accepted.

Step 2

Admission to the Counseling and Human Resource Development Department.

a. You need to make formal application to the CHRD Department. To be considered for formal admission a file containing the following items must be submitted to the Graduate School office by **May 1** for Fall, and **October 1** for Spring.

1) A one page, typewritten goal statement including **one or more** of the following:

- Your aspirations related to the field of counseling.
- One significant life event that contributed to the development of these aspirations.
- The single greatest personal asset that will serve you in realizing your aspirations.
- The one personal characteristic or quality that you most need to modify, improve, or change in order to realize your aspirations.

Goal statements that exceed one page will not be considered.

2) A current typewritten resume that includes all previous work experience, volunteer service, and education that you feel has contributed to your desire to enter the counseling profession.

3) Two completed CHRD Reference Evaluation Forms, which are available from the department. **These Evaluation Forms are in addition to the Graduate School reference forms.**

b. Applicants are **required** to attend an orientation and group interview held approximately one month after the October and May deadline. If your application is complete by the deadline, please contact the departmental secretary at 605/688-4190 to obtain the specific date and place of the interview.

Soon after the orientation and interview, each applicant will receive a letter granting or denying admission.

If granted admission you will have **one calendar year from the time of acceptance to begin taking courses**. Otherwise, you will be required to reapply formally into our program.

If admission was not granted and the student has exceeded the 10 hours allowed as Special Student status, the student will be administratively dropped from counselor education courses in which she/he enrolls. However, those students who have not been admitted may want to consider reapplying during the next application period.

Counseling and Human Resource Development (CHRD) Course Offerings

CHRD 530 Gender Issues in Counseling	3
CHRD 571 Gerontology Issues in Counseling	3
CHRD 601 Introduction to Counseling	3 F
This course provides an introduction to the counseling profession. Historic events, current concerns, responses to societal issues, legal and ethical issues are covered. This course serves as an orientation to the profession.	
CHRD 603 School Counseling	3 F
A study of the role and function of a K-12 school counselor including individual counseling, small group counseling, classroom guidance, and consultation with parents, teachers, administrators.	
CHRD 610 Developmental Issues in Counseling	3 FSSu
Provides an understanding of the developmental needs of humans across the life span and adolescents and appropriate intervention methods to be used in counseling.	
CHRD 651 Mental Health and Personality Development	3
The nature of personality and developmental theory, mental health issues of children, adolescence and adults with emphasis on programs/strategies for positive mental health. Various personality assessment methods are used. On demand.	
CHRD 661 Theories of Counseling	3 FS
This course takes a practice-based approach to teaching students counseling theory. The course focuses on several major theories, such as Adlerian, Person-Centered, Cognitive-Behavioral, and Family Systems theories. Students are encouraged to understand the utility of theory-based practice. Course work involves applying theory to case studies and developing treatment plans based on the tenets and techniques of the theories studied.	
CHRD 681 Workshop	1-3 FSSu
Special topics are comprehensively explored in an intensive time framework. Designed to increase specific skills and understandings in a current topic area.	
CHRD 682 Seminar	1-3 FSSu
Selected area of education including special investigation, reports, and discussion.	
CHRD 690 Special Topics	1-3 FSSu
Advanced courses taught upon demand covering such topics as crisis intervention, counseling special groups, cross cultural counseling, various counseling approaches, chemical dependency, etc.	
CHRD 706 Counseling the Victim	3 SSu (even years)
Study of effective counseling during the crisis and recovery stages of the healing process. Addresses the victim's experience with such issues as developmental concerns, dissociation, post-traumatic reaction, denial and loss of memory about/around the victimization. P, consent.	
CHRD 713 Administration and Management of Mental Health Organizations	3
Developing and managing a comprehensive counseling program in schools and agencies. Emphasis on the planning process management, budgeting, organizational structure, supervision, evaluation and consultation. P, consent.	
CHRD 716 Human Resource Management in Business and Industry	3 S
This course will focus on the human factors affecting the workplace. Specific topics to be covered will include employee assistance programs, wellness programs, management training, conflict resolution, and career planning.	
CHRD 722 Administration and Management of School Counseling Programs	3 S
Developing and managing a comprehensive counseling program in a school setting. Emphasis on the planning process, management, budgeting, organizational structure, supervision, evaluation and consultation.	
CHRD 723 Counseling the Family	3 F
Counseling the Family is a course which describes the major systems of family therapy and the resulting impact upon the counseling process. An inter-psychic, systematic framework will be formulated as a supplemental way to view familial problems and promote change.	
CHRD 736 Appraisal of the Individual	3 FS
Assessment methods used in studying individuals. Standardized instruments, self-report inventories, observation, case study techniques and other non-standardized assessment tools are used. Recording, analyzing, compiling and interpreting data for use in counseling setting.	
CHRD 742 Career Counseling & Planning	3 FS
Examination of the career development and counseling process through the life span. Assist those intending to counsel at elementary, secondary, higher education and the community/workplace. Explores strategies and resources for career/life planning. Various interest inventories and personality assessment methods are used.	

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

CHRD 755 Clinical Diagnosis and Treatment Planning3 F

This course is designed to introduce students to the DSM-IV and to help develop their diagnostic and treatment planning skills. Students will focus on particular disorders and how to effectively treat those disorders in clinical and school settings. Among the disorders and treatment plans that will be covered in class are: depressive disorders, anxiety disorders, substance abuse disorders, schizophrenia, disorders first diagnosed in infancy, childhood and adolescence, as well as personality disorders. P, Abnormal Psychology within the last five years.

CHRD 756 Counseling the Addictive Client3

Counseling the addictive client is a course which describes how one can identify and treat addictive behaviors. Emphasis is on preventive and remedial action.

CHRD 766 Group Counseling3 FSSu

Processes and procedures used in small group counseling. Students participate in group counseling, facilitate in-class counseling sessions and develop structured units for specific populations. P, CHRD 601, 610, 661, EdER 761. Written permission. P, consent.

CHRD 770 Student Development: Theory and Practice3 F

This course introduces various theories of college student development and includes attention to developmental issues of special populations, such as minority students, international students, and nontraditional students. Research in several areas of student affairs work is emphasized.

CHRD 771 Student Personnel Services3 S

Two basic orientations provide the framework for this course: understanding the transition from theory to practice, and becoming a reflective, ethical practitioner. Students will gain a broad knowledge of student affairs functions as well as a good overview of current issues in higher education.

CHRD 772 Administration and Leadership in Student Affairs 3 S

Legal cases and precedents having a major impact in student affairs administration are covered in this course. In addition, leadership skills are developed. The differences between public and private institutions as well as among various constituent groups in higher education are included.

CHRD 786 Pre-Practicum.....3 FSSu

This course provides an introduction to basic therapeutic skills and structures compatible with a wide range of theoretical approaches. Students learn to conduct counseling interviews in order to successfully identify clients' conflicts, determine clients' desire for change, explore options and assist client action. This course serves as a foundation of CHRD 787 Counseling Practicum. P, CHRD 601, 610, 661, EdER 761.

CHRD 787 Practicum3 FSSu

This course builds on the basic counseling skills learned in CHRD 786 Pre-Practicum and preferably directly follows that course in students' course work. In addition to enhancing basic counseling skills, this course is designed to help students integrate theory and practice. As part of their course work, students are asked to develop theory-based conceptualizations of client concerns. The faculty reserve the right to deny admission to CHRD 787 if they have reason to suspect a student might be unable to provide quality counseling services to clients. A minimum of 20 semester credit hours, including EdER 761, CHRD 601, 661, 721, and 786, with a grade of "B" or better in 721 and 786.

CHRD 788 Group Counseling Practicum3

Supervised practicum in conducting small group counseling sessions. P, CHRD 766, consent.

CHRD 789 Internship2-6 FSSu

Eligibility for Internship requires that the student have completed CHRD 787 Counseling Practicum with the grade of "B" or better, and a substantial amount of their course work. Ideally, all course work would be completed prior to enrollment. Students must have proof of professional liability insurance that is in force for the duration of this experience. Internships must be in appropriate settings under the direct supervision of a qualified and appropriately credentialed professional. Due to the nature of this course (students working directly with clients) the faculty reserve the right to deny admission to CHRD 789 if they have reason to suspect that the student's personal limitations might keep them from rendering competent services. P, consent, approval from Internship Committee.

CHRD 790 Thesis1-6 FSSu

CHRD 791 Thesis Sustaining0 FSSu

CHRD 792 Research Problems in Counseling and Guidance.....2 FSSu

A problem is selected, analyzed, and reported in form approved by the research advisor. *Required* of all graduate students in counseling qualifying for Master's degree under Option B. Can be *elected* under Option C if desired. P, consent.

CHRD 793 Problems1-3 FSSu

Directed reading and research in selected individual guidance and counseling topics.

Dairy Science

Degrees Offered:

- Ph.D. Animal Science
- Ph.D. Biological Sciences
 - Dairy Science area of study
- M.S. Animal Science
 - Nutrition emphasis
- M.S. Biological Sciences
 - Dairy Manufacturing emphasis

Department Head: Professor John Parsons
Graduate Coordinator: Professor John Parsons

For additional information contact:

Mailing address: SDSU Box 2104

Dairy Microbiology — DM

WWW: <http://www.abs.sdstate.edu/dairysci/dairysci.htm>

E-mail: John_Parsons@sdstate.edu

Phone: 605/688-4116

Fax: 605/688-6276

Program Description

The Dairy Science Department provides research opportunities leading to M.S. and Ph.D. degrees in both Animal Science and Biological Sciences. Contact the department for specific research areas.

Available Options for Graduate Degrees

- Master of Science: Option A
Doctor of Philosophy: 60-Credit Plan
90-Credit Plan

See pages 15 (M.S.) and 18 (Ph.D.) for descriptions of available options.

Core Requirements

None

Additional Admission Requirements

- GRE: Not required
TOEFL: Department requirement of 525

General Requirements begin on page 13 (Master's Degree) and page 18 (Ph.D.).
Graduate students should consult with their advisor before registering for graduate work.

Dairy Science (DS) Course Offerings

DS 513 Physiology of Lactation3 S (even years)
Anatomy, physiology, and biochemistry of mammary glands. Factors affecting quality and quantity of milk. P, Vet 223 or equivalent.

DS 702 Seminar1 S
Research report writing, oral reports and discussion of current research in dairy production, dairy manufacturing, and related sciences. Maximum of 2 credits will be allowed for Master of Science or 4 credits for Doctor of Philosophy degree.

DS 711 Ruminology3 F (odd years)
Biochemical, physiological, and microbiological activity occurring in the rumen and the relation of rumen function to animal response. P, Chem 361 and Vet 223 or consent.

Graduate Faculty

Robert J. Baer
Professor
Ph.D., University of Georgia,
1983
Sensory Evaluation of Dairy
Products, Dairy Chemistry

Rajiv Dave
Assistant Professor
Ph.D., Victoria University of
Technology - Melbourne,
Australia, 1998
Mozzarella Cheese, Probiotics
and Dairy Microbiology

David Henning
Associate Professor/Alfred
Chair
Ph.D., Oregon State University,
1966
Microbiology of Dairy
Products, Product Safety

Arnold Hippen
David H. Henry Sustained
Professorship - Assistant
Professor
Ph.D., Iowa State University,
1997
Dairy Cattle Nutrition and
Feed Management

Vikram Mistry
Professor
Ph.D., Cornell University, 1986
Membrane Processing, Cheese
Technology, Dairy Chemistry

John G. Parsons
Professor
Ph.D., Pennsylvania State
University, 1968
Dairy Chemistry, Flavor
Analysis

David J. Schingoethe
 Professor
 Ph.D., Michigan State
 University, 1968
 Protein/Energy Nutrition,
 Metabolism/Whey Utilization
 by Dairy Cattle

DS 722 Advanced Dairy Microbiology	3 S (even years)
Role of microorganisms in manufacture and spoilage of dairy products. Emphasis on starter culture technology. P, DS 301 or Micr 311.	
DS 722A Advanced Dairy Microbiology Lab	0
DS 731 Laboratory Techniques in Dairy Science	2 F (even years)
Research design, laboratory techniques, and data management and presentation in Dairy Science. Laboratory procedures include photometry, gas chromatography, and microbiological (aerobic and anaerobic) assays.	
DS 780 Dairy Science Problems	1-4 FSSu
DS 790 Thesis	1-7 (as arranged)
DS 791 Thesis Sustaining	0
DS 890 Dissertation—Ph.D.	1-12 (as arranged)
DS 891 Dissertation Sustaining	0

Biological Sciences (BioS) Course Offerings

BioS 890 Dissertation—Ph.D.	1-7 FSSu
BioS 891 Dissertation Sustaining	0 FSSu
BioS 892 Ph.D. Seminar	1 FS

SDSU is one of the few universities in the U.S. with a traditional Dairy Science Department. It is equipped with excellent laboratories, a dairy processing plant which manufactures fluid milk, cheese, butter, ice cream, and other products; and a dairy production research and training facility where a herd of 400 Holstein and Brown Swiss cattle for teaching and research is maintained. Metabolism and surgical facilities in the Animal Science Complex, and specialized laboratory equipment in Station Biochemistry, Veterinary Science, and Nutrition and Food Science Departments are also available. Graduate students accepted into the program will have opportunities to utilize these facilities to develop basic and/or applied research programs in dairy product processing, microbiology, chemistry, food safety, dairy cattle nutrition, metabolism, breeding, ruminal microbiology, immunology, and management, while interacting with well-qualified faculty.

The SDSU Dairy Science Department, in collaboration with the Food Science and Nutrition Department at the University of Minnesota, is a National Dairy Foods Research Center partially supported by the National Dairy Research and Promotion Board. This provides graduate students in the manufacturing area a unique opportunity to be involved with current issues and research needs.

Economics

Degrees Offered:

M.S. Economics

J.D./M.S. Economics (Cooperatively with University of South Dakota)

Department Head: Professor Richard Shane

Graduate Coordinator: Associate Professor Scott Fausti

For additional information contact:

Mailing address: SDSU Box 504

Scobey Hall — SCO

WWW: <http://econnet.sdstate.edu/dept/grad/program.asp>

E-mail: ScottFausti@sdstate.edu

Phone: 605/688-4141

Fax: 605/688-6386

Program Description

The graduate curriculum is designed to prepare students for professional placement or further graduate study. Emphasis is placed upon development and application of analytical skills. Students can design an individualized program within any of four areas of concentration: business economics; agricultural business; general economics; or, agricultural economics. All students take a core of applied theory and analysis courses and complete their individual program. An Accelerated program is offered that allows exceptional students to start their graduate studies while completing their undergraduate degree. The combined degree program can be completed in five years. Many courses are offered in the evening. A limited number of research and teaching assistantships are available for qualified students. The Economics Department offers courses that satisfy requirements in the Master of Science in Industrial Management program.

Available Options for Graduate Degrees

Master of Science: Option A
 Option B
 Accelerated

See page 15 for descriptions of available options. Individuals interested in the Accelerated option should contact the graduate coordinator for application requirements.

Core Requirements

Econ 703 Advanced Macroeconomics3
Econ 704 Advanced Microeconomics.....3
Econ 705 Econometrics.....3

No converted graduate credit will be granted for the following 300-499 advanced undergraduate courses: Econ 301 Intermediate Microeconomics, Econ 302 Intermediate Macroeconomics, BAdm 380 Personal Finance, Stat 341 Statistical Methods I.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

Prerequisites for unconditional admission into the program are completion of Econ 301, Econ 302, Stat 341, and calculus.

Graduate Faculty

Dwight Adamson
Associate Professor
Ph.D., Washington State
University, 1988
Macroeconomics; Statistics

Martin K. Beutler
Professor
Ph.D., Purdue University, 1986
Agricultural Impacts and
Coordinated Resource
Management

Carol Cumber
Associate Professor
Ph.D., South Dakota State
University, 1994
Business Management and
Business Policy

Thomas L. Dobbs
Professor
Ph.D., University of Maryland-
College Park, 1969
Sustainable Agriculture;
Natural Resource Economics;
Agricultural Production

Scott Fausti
Associate Professor
Ph.D., University of Illinois,
1991
Macroeconomics;
Mathematical Economics

Howard A. Gilbert
Professor
Ph.D., Oregon State University,
1967
Microeconomic Theory; Small
Business Management

Nicole Klein
Assistant Professor
Ph.D., Kansas State University,
1996
Management, Marketing

Larry Janssen
Professor
Ph.D., University of Nebraska-
Lincoln, 1978
Agricultural Finance;
Agricultural Policy

Han J. Kim
 Professor
 Ph.D., Oregon State University,
 1969
 Econometrics, Operations
 Research

Charles Lambertson
 Professor
 Ph.D., Iowa State University of
 Science and Technology, 1975
 Microeconomic Theory;
 Mathematical Economics;
 Finance

Burton Pflueger
 Professor
 Ph.D., University of Illinois,
 1985
 Financial and Farm
 Management

Joseph M. Santos
 Assistant Professor
 Ph.D. Rutgers University, 1996
 Macroeconomics, Money and
 Banking

Richard Shane
 Professor
 Ph.D., Washington State
 University, 1978
 Grain Marketing

John Sondex
 Associate Professor
 Ph.D., Washington State
 University, 1989
 Marketing

Evert Van der Sluis
 Assistant Professor
 Ph.D., University of Minnesota,
 1993
 International Economics:
 Value-Added

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

J.D./M.S. in Economics. A cooperative program between the University of South Dakota School of Law and South Dakota State University Department of Economics. The two institutions mutually accept up to nine semester hours of transferred credit. Students design their academic program in Economics to best suit their career goals and interests. For details, consult the USD Law School or SDSU Economics Department.

Agricultural Economics (AgEc) Course Offerings

AgEc 521 Farming and Food Systems Economics3 S
 Economic concepts and methods for analyzing farming system and food system alternatives, investments, and issues. Includes economic feasibility analysis methods for assessing potential farm/ranch, value-added, and other food enterprises. Economic structure and organization of food systems in U.S. and other parts of the world are examined. P, Senior standing, AgEc 271 or Econ 201.

AgEc 571 Advanced Farm & Ranch Management3
 Leasing arrangements, capital investment, computerized accounting and budgeting. Linear programming as a tool for planning and organizing the farm business. P, senior standing, 271, Econ 301, or consent.

AgEc 621 Advanced Production Economics.....3
 Economic theory and quantitative techniques used in the analysis of agricultural production decisions; estimation of production functions; determination of optimal input and output combinations; and the impacts of risk on production decisions. P, Econ 423 and BAdm 324.

AgEc 630 Advanced Agricultural Marketing & Prices3
 Economic theory and quantitative techniques used in analysis of agricultural market problems, construction of economic models, statistical estimates of supply and demand, and price forecasting. P, AgEc 354, Econ 301, Econ 423, or consent.

AgEc 690 Special Problems1-3 FS
 Advanced work or special problems with focus on agriculture. Open to graduate students. P, consent.

Economics (Econ) Course Offerings

Econ 504 History of Economic Thought3
 The historical development of economic ideas. Various schools of economic thought and the economic environment which produced them. P, 301, 302 or consent.

Econ 520 Economics of the Public Sector3
 Governmental operations, policies, and revenues as related to employment, productivity and economic welfare. Alternatives that would affect social services, education, commerce and trade, fiscal policies, and quality of life. P, 201 or consent.

Econ 531 Managerial Economics3
 Applications of microeconomic theory, statistics and other quantitative methods to analysis and solution of decision making problems confronted by managers of agribusiness, commercial and manufacturing enterprises. Topics include economic analysis of demand, production, cost, market structure, government regulation, risk, and capital budgeting. P, 301, Math 222, Stat 341, or equivalent.

Econ 540 Economics of the International Sector3
 International flow of trade and balance of payments. Monetary and fiscal policies. Trade controls and their effect upon the agricultural and domestic economies. Significant current developments in trade and finance. P, 201, 202, 330 or consent.

Econ 550 Industrial Organization3
 The elements involved in market power and how they function. How the structure of institutions and conduct of sellers and buyers affect economic performance. P, 301 and 302 or consent.

Econ 560 Economic Development3
 Developing and developed national economies. Factors impacting economic development. Role of public policies in development. Agricultural and rural development issues emphasized. P, 201, 202, or consent.

Econ 572 Resource and Environmental Economics	3
Allocation, conservation, and development of natural resources. Environmental economics, water and land use, and methods of evaluating projects and programs. P, 201.	
Econ 601 Economic Study in Industrial Management	3
Intensive study of economic choice and value theory, financial statement structure and analysis, and financial management. Not open to Economics majors.	
Econ 610 Financial Management	3
Advanced techniques for managing working capital, capital budgeting, analysis of financial structure and cost of capital, valuation, financial planning and control. P, BAdm 310, Stat 341 or Math 381, or consent.	
Econ 624 Advanced Mathematical Economics	3
Integral calculus, differential and difference equations, optimal control and other methods used to analyze economic dynamics, investment, growth and other advanced topics in economics. P, Econ 428.	
Econ 653 Advanced Market Research	3
Strategic marketing and decision making with emphasis on utilizing both qualitative and quantitative techniques as well as marketing models. P, Econ 301, Econ 353, and Stat 341 or Math 381.	
Econ 660 Operations Management	3
Product planning, demand forecasting and management, capacity planning, scheduling, inventory planning and timing, materials management, quality, work standards and measurement. P, BAdm 360, Econ 301 and Stat 341 or Math 381.	
Econ 690 Special Problems	1-3 FS
Advanced work in special problems in economics. Open to graduate students by consent.	
Econ 703 Advanced Macroeconomics	3 S
Comparative statics analysis of aggregate income determination; comparison of alternative stabilization policies; modeling of investment and consumption behavior, dynamic analysis of optimal growth. P, Econ 428 or consent.	
Econ 704 Advanced Microeconomics	3 F
Rigorous analysis of topics in microeconomics including: methodology of economic science, economic choice, production, resource allocation, distribution, welfare economics, and general equilibrium. P, Econ 428 or consent.	
Econ 705 Econometrics	3 S
Practice in the application of micro- and macro-economic theory to solutions of real and hypothetical problems. Selection and use of appropriate statistical and other analytical methods suitable for complex problems. P, Econ 423, Econ 428.	
Econ 782 Personnel and Labor Relations	3
Labor relations, negotiation and arbitration; pay and benefits; hiring, promotion and termination policies; use of testing in the workplace. P, BAdm 360 or consent.	
Econ 790 Thesis	1-7 (as arranged)
Econ 791 Thesis Sustaining	0
Econ 792 Research Paper	2
Econ 793 Graduate Special Topics	1-4
Organized by an instructor in consultation with the department head and a group of students. The course will provide a medium through which a specific topic can be pursued. The course will normally be experimental and may be a one time only effort for a particular semester and the unique group of students. Maximum: 4 credit hours per semester, 7 credit hours per degree.	
Econ 795 Research Paper Sustaining	0 FSSu

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Educational Leadership

Degrees Offered:

M.Ed. Curriculum and Instruction

- Adult and Higher Education emphasis
- Agricultural Education emphasis
- Computer Education emphasis
- Content area emphases
 - Biology Education
 - Chemistry Education
 - Mathematics Education
 - Physics Education
- Gifted Education emphasis
- Instructional/Technical Education emphasis
- Middle School Education emphasis
- Reading Education emphasis

M.Ed. Educational Administration

- Adult and Higher Education emphasis
- Career/Technical Education emphasis
- Elementary Administration emphasis
- Secondary Administration emphasis

Graduate Faculty

Larry H. Brown
Associate Professor
Ph.D., Florida State University,
1979
Leadership, Foundations,
Supervision

Peggy Gordon Elliott
President/Professor
Ed.D., Indiana University, 1975
Leadership, Teaching, Reading

R. L. Erion
Professor
Ph.D., Texas A & M University,
1985
Research, Computers

Clark W. Hanson
Professor
Ph.D., Iowa State University of
Science & Technology, 1972
Agricultural Education, CTE

Dee Hopkins
Professor
Ed.D., Indiana University, 1982
Leadership, Library Science,
Storytelling

Lonell Moeller
Professor
Ph.D., Iowa State University of
Science & Technology, 1981
Agricultural Education, CTE,
Computers

Kathryn Penrod
Associate Professor
Ph.D., Cornell University, 1984
Adolescence, Teaching

Department Head: Associate Professor Larry H. Brown

Graduate Coordinator: Associate Professor Larry H. Brown

For additional information contact

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Fax: 605/688-6074

Program Descriptions

Curriculum and Instruction

This major is appropriate for K-12 classroom teachers, recreation program staff, adult and community educators, Cooperative Extension Service personnel, and junior/community college instructors. Within this major, the programs above are available.

Educational Administration

This major is designed to provide the basic professional preparation for those who expect to become qualified administrators in schools where certification is required, and for other institutions, businesses, industries and service-orientated agencies where an administrative program is of value. The South Dakota State Board of Education requires four years of teaching experience for administrator certification. The emphases above are presently available.

Available Options for Graduate Degrees

Master of Education: Option B

Option C

See page 15 for descriptions of available options.

Core Requirements

Curriculum and Instruction, see sidebar on page 69.

Educational Administration, see sidebar on page 69.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

Applicants must provide a resumé, goal statement, and two letters of professional reference to the Graduate School. Once all material is received, it is reviewed by the Department. Students are assigned an admission status of “unconditional,” “conditional” or “not admitted.”

General Requirements begin on page 13 (Master’s Degree).

Graduate students should consult with their advisor before registering for graduate work.

Agricultural Education (AgEd) Course Offerings

- AgEd 506 Problems1-3 FSSu**
Directed reading and research in selected agricultural education topics.
- AgEd 605 Seminar1-2 FSSu**
Selected areas of Agricultural Education including special investigation, reports, and discussion.
- AgEd 706 Adult Ed in Ag2 Su**
Selected areas of Agricultural Education including special investigation, reports, and discussion.
- AgEd 707 Supervised Occupational Experiences & Student Groups in2 Su**
Emphasizes relationships of occupational experience and vocational student organization in agriculture to instructional programs; needs, scope, techniques and materials in developing and improving these programs. P, graduate student in Agricultural Education.
- AgEd 776 Curriculum in AgEd2 Su**
For teachers, administrators and supervisors of vocational agriculture/agribusiness programs at secondary, post secondary and adult levels; principles and procedures in course building, courses of study, and curriculum. P, graduate student in Agricultural Education. Cross-listed with CTE 776.
- AgEd 792 Research Problems in AgEd2 FSSu**
A problem is selected, analyzed, and reported in form approved by the research advisor. *Required* of all graduate students in education qualifying for the degree under Option B. Can be *elected* under Option C, if desired. P, consent.

Adult Higher Education (AHEd) Course Offerings

- AHEd 600 Special Problems in Extension.....2-6**
Individually assigned investigative problems in Extension. Individual conference with laboratory and/or field work. Arrangements with Extension staff must be made prior to registration.
- AHEd 681 Workshop in Adult & Continuing Education1-3 FSSu**
Special areas in adult and continuing education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understanding in a current area.
- AHEd 691 Problems1-3 FSSu**
Directed reading and research in selected individual adult and continuing education topics.
- AHEd 710 Adult Curriculum and Instruction3 F**
Adult learning theory and instructional methods. Principles of adult curriculum design. Social and cultural factors and their effects on the learning process.
- AHEd 711 Organization and Administration of Adult Education3 S**
Organization and implementation of adult education programs. Particular emphasis on curriculum development, financing, staffing, marketing, and evaluation of adult programs.
- AHEd 751 Principles of College Teaching3 S**
An analysis of teaching methodologies, planning procedures, evaluation techniques, and professional relationships. Emphasis will be on learning and using strategies suitable for teaching.
- AHEd 772 Administration and Leadership in Student Affairs3**
Provides an overview of administrative and leadership practice in Student Affairs work. The course focuses on the theoretical foundations of Student Affairs administration and the utilization of those foundations in the daily management of Student Affairs units. Student will gain both knowledge and experience in applying theory to the administration of Student Affairs operations. Cross-listed with CHRD 772.
- AHEd 782 Seminar1-3 FSSu**
Study in selected areas of adult and continuing education including special investigation, reports and discussion.

Denise M. Peterson
Assistant Professor
Ed.D., University of South
Dakota, 1998
Distance Education

Lawrence Rogers
Associate Professor
Ph.D., University of Nebraska,
1975
Foundations, Curriculum,
Social Studies

Loye Romereim-Holmes
Professor
Ed.D., University of South
Dakota, 1987
Special Needs, Reading

Adjunct/Courtesy/Joint Faculty

Mark A. Baron
Associate Professor
Ph.D., University of Alabama,
1991
Strategic Planning

Gregory A. Boris
Assistant Professor
Ed.D., University of Minnesota,
1997
Paraeducators in Public
Schools

Floyd Boschee
Professor
Ed.D., University of Montana,
1972
School Administration &
School Law

Karen A. Card
Assistant Professor
Ph.D., Ohio State University,
1991
Public Policy & Higher
Education

Jay A. Heath
Professor
Ed.D., University of South
Dakota, 1977
School Improvement Process

Michael P. Reger
Assistant Professor
Ph.D., Ohio State University,
1983
Leadership, Student Affairs,
Administration

James S. Hazlett
Professor
Ph.D., University of Chicago,
1968
Educational Foundations

Adult & Higher Education Program Specialization*

AHEd 710
Adult Curriculum and Instruction3

AHEd 711
Organization and Administration of Adult Education3

CHRD 771
Student Personnel Services3

OR

EdAd 735
School Law3

HDCF 614
Adult Development3

OR

CHRD 770
Student Development: Theory and Practice3

AHEd 789
Internship2

**Will not lead to Elementary/Secondary Principal Certification*

Adult and Higher Education Additional Requirements*

AHEd 710
Adult Curriculum and Instruction3

AHEd 711
Organization and Administration of Adult Education3

AHEd 751
Principles of College Teaching3

HDCF 614
Adult Development Theory 3

EdFn 720
History and Philosophy of Education3

EdFn 727
Group Processes3

EdER 711
Educational Assessment ...3

EdFn 782
Seminar: Capstone1

**Will not lead to Elementary/Secondary Principal Certification*

AHEd 789 Internship in Education1-6 FSSu
On the job participation in teaching or related fields in schools under the supervision of local school personnel and a staff member from the College of Education and Counseling.

AHEd 792 Research Problems in Adult Ed2 FSSu
A problem is selected, analyzed, and reported in form approved by the research advisor. *Required* of all graduate students in education qualifying for the degree under Option B. Can be *elected* under Option C if desired. P, consent.

Career and Technical Education (CTE) Course Offerings

CTE 519 Methods of Teaching3 F/Su (Depends on Rotation)
This course will feature lesson presentation and methods of delivering instruction in vocational technical education. The course is designed for individuals who are presently teaching in the vocational technical education field. Content builds upon existing knowledge of the program participants in order to increase comprehension of the field of vocational technical education. Instructional techniques appropriate for vocational technical education are developed based on the models identified in competency-based or performance-based education. Special emphasis is placed upon teaching methods which coexist with a performance-based philosophy. Participants are actively involved in current teaching assignments which creates an enormous opportunity for reflection and debate.

CTE 520 Entrepreneurship in Career and Technical Education3 F/Su (Depends on Rotation)

This course is designed to help educators in all areas of vocational education to incorporate basic concepts of entrepreneurship into the curriculum. Topics include: small business plans, government regulations, site locations, record keeping, financing, legal consideration, business promotions, managing human resources, small business contributions to the economy and economic development, educational resources for entrepreneurship, placement of the entrepreneurship concept in vocational education programs and review of basic concepts related to entrepreneurship such as business ownership options and entrepreneur characteristics.

CTE 525 Development of Career and Technical Education Thought & Practice3 F/Su (Depends on Rotation)

Philosophy, origins, and development of vocational, technical and practical arts, education programs at adult, post-secondary, secondary, and pre-vocational levels. Current and emerging principles, practices, and issues are stressed.

CTE 530 Cooperative Education Coordination Techniques3 F/Su (Depends on Rotation)

This course emphasizes the organization and coordination of cooperative work experience in vocational education programs: agriculture, marketing education, health occupations, family consumer sciences education, business education, and trade and industrial. Emphasizes strategies and techniques for coordinating classroom instruction with on-the-job work experience. Topics include: program organization, coordinator responsibilities, student selection, placement, advisory councils, public relations, training stations, training plans, legal aspects, and program and student evaluation.

CTE 540 Curriculum Design in Career and Technical Education 3 F/Su (Depends on Rotation)

This course addresses principles in developing vocational education curriculum research, development, implementation, and evaluation at the secondary, post-secondary and adult levels. Concepts include: coordination and organization of vocational education curriculum, curriculum design models (including competency-based education and applied academics); trends in state and national programs; long-range planning; articulation between secondary, post-secondary and 4-year programs.

CTE 573 Special Problems1-4
Directed reading and research in selected individual topics.

CTE 590 Special Topics 1-3
Advanced courses taught on demand covering such topics as computer applications, state and federal rules and regulations, new curriculum development, etc.

CTE 599 Methods of Teaching2-3

CTE 700 Technology in Career and Technical Education 3
Presents technology-based alternatives to traditional standard delivery group instruction practices. Emphasizes computer-assisted and computer-managed instructional concepts, interactive video, interactive telecommunications, and other distance learning methods. Also addresses individualized learning approaches to education. P, Baccalaureate degree or consent. Computer background.

CTE 731 Administration & Supervision of Career and Technical Education 3 Su
Organization, administration of career and technical education and the practical arts at all levels. Local-state-federal relationships in administration and supervision. State plan development, reimbursement plans and procedures, projected activities, and program standards. Principles of effective supervision and evaluation applicable to vocational-technical education. P, consent.

CTE 743 Special Topics	1-3
Advanced courses taught upon demand.	
CTE 751 Curriculum in Family Consumer Sciences Education	2
Cross-listed with FCSE 751.	
CTE 761 Evaluation in Family Consumer Sciences	2
CTE 776 Curriculum in Agricultural Education	2
For teachers, administrators and supervisors of career and technical agriculture/programs at secondary, post secondary and adult levels; principles and procedures in course building, courses of study, and curriculum. Cross-listed with AgEd 776.	
CTE 782 Seminar	1-3
Study in selected areas of career and technical education including special investigation, reports, and discussion.	
CTE 789 Graduate Internship	1-3
Students apply and contract for structured learning and skills training opportunities in industry or business. Individual contracts must describe specific training and development to be accomplished during the internship. Enrollment requires instructor's prior approval of the internship contract. Requires committee approval.	
CTE 790 Thesis in Career and Technical Education	5
CTE 791 Thesis Sustaining in Career and Technical Education	0
CTE 792 Research Problems	2
Significant action research in an area related to the student's technical specialty. A problem is selected, analyzed and reported in a form approved by the research advisor. Required of all graduate students in education qualifying for the Master's of Education degree under the Research Option. Requires advisor's approval.	
CTE 793 Problems	1-3
Directed reading and research in selected career and technical education topics. Written permission of Department required.	

**Curriculum and Instruction
Core Requirements**

EdER 761	
Informational Literacy	3
EdFn 725	
Education in a Pluralistic Society	3

**Educational Administration
Core Requirements**

EdAd 700	
Public School Administration	3
EdAd 715	
Supervision	3
EdFn 725	
Education in a Pluralistic Society	3
EdFn 727	
Group Processes	3
EdER 711	
Educational Assessment	3
EdER 761	
Informational Literacy	3
EdFn 782	
Seminar: Capstone	1

Educational Administration (EdAd) Course Offerings

EdAd 700 Introduction to School Administration	3 FSu
A broad overview of administration. Will examine administration as an applied science and analyze the organizational, political, and human relations systems as forces affecting administration. Specific topics will include conflict resolution, crisis management, planning, staff development, evaluation, and communications theory.	
EdAd 707 The Principalship	2 Su
Emphasis is on the principal as an instructional leader with major topics focusing on staff recruitment, supervision and evaluation, student services, rights and responsibilities, research on effective schools, parent community relationships and the principal's role in dealing with current issues facing our schools. EDAD 708 Elementary Principalship Practicum or EDAD 709 Secondary Principalship Practicum is a corequisite.	
EdAd 708 Elementary Principalship Practicum	1 Su
Field-based problem-centered experience. EDAD 707 The Principalship is a corequisite.	
EdAd 709 Secondary Principalship Practicum	1 Su
Field-based problem-centered experience. EDAD 707 The Principalship is a corequisite.	
EdAd 715 Supervision	3 SSu
A study of leadership styles and the effects different styles have on motivating people. Emphasis on utilizing and developing human potential.	
EdAd 730 School Finance	2
Develop an understanding and a working knowledge of school finance theory and practice. Emphasis will be placed on the school finance reform movement in recent years.	
EdAd 732 School Buildings & Grounds	2
Management, care and operation of school plant. Needs and evaluation of existing facilities, new buildings and remodeling. Emphasis on facility planning at school system and building levels. Not a technical course in design and materials.	

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

EdAd 735 School Law3 SSu
Legal foundations of elementary and secondary education in our society; legal powers and relationships of school boards, administrators, teachers, parents (guardians) and students. Emphasis will be placed upon the values underlying these foundations, powers and relationships.

EdAd 781 Workshop1-3 FSSu
Special areas in education administration are comprehensively explored in an intensive time framework. Designed to increase specific skills and understanding in a current area.

EdAd 782 Seminar1-3 FSSu
Study in selected areas of education administration including special investigation, reports, and discussion.

EdAd 789 Internship in Education1-6 FS
On-the-job participation in administration or working with administrative tasks in public schools under supervision of local school administrator and a staff member from the College of Education and Counseling.

EdAd 792 Research Problems in Ed Administration2 FSSu
A problem is selected, analyzed, and reported in form approved by the research advisor. *Required* of all graduate students in education qualifying for the degree under Option B. Can be *elected* under Option C if desired. P, consent.

EdAd 793 Problems1-3 FSSu
Directed reading and research in selected education administration topics.

EdAd 795 Special Topics1-3
Advanced study covering topics not regularly taught within the regular program. Topics may include the administrator and special education rural schools, managing change. These advanced courses would be taught upon demand and when sufficient enrollment would warrant them.

Education Evaluation and Research (EdER) Course Offerings

EdER 590 Special Topics1-3 FSSu
Advanced courses will be taught upon sufficient demand covering such topics as Least Restrictive Environment, computers in education, observation techniques for classroom evaluation.

EdER 691 Problems1-3
Directed reading and research in selected education topics.

EdER 711 Educational Assessment3 SSu
Examines the theory and principles of educational assessment.

EdER 761 Informational Literacy3 FSSu
This course helps students become critical consumers of professional information by addressing the location, evaluation, use, and communication of information. Particular emphasis is placed on the knowledge needed to be an informed and effective consumer of research.

EdER 763 Educational Inquiry3 FSSu
Research design and methods for education professionals. Emphasis on the implementation of research concepts for action research and program evaluation.

EdER 792 Research Problems in Education2 FSSu
A problem is selected, analyzed, and reported in a form approved by the research advisor. *Required* of all graduate students in education qualifying for the degree under Option B. Can be *elected* under Option C if desired. P, consent.

Education Foundations (EdFn) Course Offerings

- EdFn 527 Middle School: Affective Applications2 SSu**
 Group processes and issues in affective education at the middle school/junior high level. Topics for study are group processes, interdisciplinary team planning, cooperative learning, student advisory programs, self-esteem building, and student/teacher relationships. P, admitted to teacher education program, junior standing, an adolescent psychology/development course of 3 credits.
- EdFn 528 Middle School Curriculum and Instruction3 SSu**
 The essential methods and materials of judging high/middle school instruction. Methods and topics included are the middle school concept, team teaching, mastery learning, exploratories, classroom management, and grouping strategies. Representative curriculum materials, appropriate to the transescent learner, are examined and utilized in multi-disciplinary team planning projects. P, admitted to teacher education program, junior standing, adolescent developmental/psychology course of 3 credits.
- EdFn 551 Curriculum and Instruction in Gifted Education3 Su**
 Examines curriculum methods and materials for gifted and talented children and youth. Students will be exposed to various programming models, IEP development, differentiated curricular concepts, as well as skills in self-directed learning.
- EdFn 560 Applied Linguistics for Teaching English as a Second Language3**
 The study of social and linguistic structures which undergird different discourse forms. Emphasis will be on discourse forms which are particularly important for full participation in U.S. culture such as the rhetoric of public and school interactions. P, Ling 203 English Grammar or equivalent or instructor's permission.
- EdFn 561 Cultural and Psychological Perspectives in the Acquisition of English as a Second Language3**
 Addresses the social and cognitive processes involved in the acquisition of a second language including developmental influences. P, Ling/Educ 460/560.
- EdFn 562 Teaching Language Arts for English as a Second Language Across the Curriculum ...3**
 The teaching of reading and writing to students with limited English proficiency. Emphasis will be on reading and writing as it pertains to performance in educational and public settings. P, Ling/Educ 460/560.
- EdFn 563 Methods of Teaching English as a Second Language3**
 Develops the central concepts, tools of inquiry, and structure of teaching English to students with limited English proficiency. Includes the evaluation of instructional processes, learning resources, curriculum, and programs. Emphasis will be on teaching students to use English in educational and public settings. P, Ling/Educ 460/560.
- EdFn 590 Special Topics1-3**
 Advanced study covering such topics as Introduction to Multi-Cultural Education, Introduction to Law Related Education, and Interpretation and Implementation of Individuals with Disabilities Act (IDEA).
- EdFn 605 Computers in the Classroom2**
 Examines the relationship between teaching methods, learning theory and the place of the computer in the classroom; covers such topics as the data processing cycle, an overview of computer hardware and software, computer vocabulary, career opportunities, and some programming. P, EPsy 302 or consent.
- EdFn 648 Learning Styles3 (alternate years)**
 Learning styles deals with research findings about learning styles and teaching styles. It examines learning style inventories, and explores how teachers can adapt instruction to promote student interest and success, based on the students varying approaches to learning. The course is appropriate for all educational personnel. Alternate years.
- EdFn 700 Working with Exceptional Children3 S**
 Assist regular classroom teachers to better understand and more effectively teach students with special learning needs. Focuses on learning disabilities, mental retardation, and behavior disorders. Also includes short sections regarding hearing impairments, visual impairments, orthopedic or health impairments, speech/language disorders, and the gifted. Regular classroom curricular adaptations and modifications are included.
- EdFn 725 Education in a Pluralistic Society3 SSu**
 Focus on school issues surrounding pluralism in a democratic society. This course relates to working with the diversity of populations within our schools. This diversity is represented in our schools by the multi-cultural nature of American society, and differences associated with exceptionality, gender, age, religion, and socio-economic status. The course will focus on preparing educators to confront issues relating to pluralism and diversity and to work productively in a variety of settings.

Elementary and Secondary Program Specialization

- EdAd 735
 School Law3
- EdFn 744
 Research on School Improvement3
- EdFn 745
 Effective Teaching: Theory into Practice3
- EIEd 773
 Elementary School Curriculum3
- OR**
- SEED 740
 Secondary School Curriculum3
- EdAd 711
 Secondary School Administration3
- OR**
- EdAd 710
 Elementary School Administration3
- EdAd 789
 Internship2-6

Elementary and Secondary Program Additional Requirements

- EdFn 720
 History and Philosophy Education3
- EdFn 745
 Effective Teaching: Theory into Practice3
- EIEd 773
 Elementary School Curriculum3
- OR**
- SeEd 740
 Secondary School Curriculum3
- EPsy 740
 Advanced Ed Psychology3
- EdFn 744
 Research on School Improvement3
- EdFn 727
 Group Processes3
- EdER 711
 Educational Assessment ...3
- EdFn 782
 Seminar: Capstone1

Career and Technical Education Additional Requirements*

- EPsy 740
Advanced Ed
Psychology.....3
- OR**
- HDCF 614
Adult Development Theory
3
- CTE 625
Development of Vocational
Education Thought and
Practice3
- CTE 700
Technology in Vocational
Education.....3
- CTE 710
Curriculum Design and
Evaluation.....3
- CTE 730
Cooperative Education
Coordination
Techniques.....3

**Will not lead to Elementary/
Secondary Principal
Certification*

Career and Technical Education Program Specialization*

- CTE 710
Curriculum Design in
Vocational Education3
- CTE 731
Administration and
Supervision of Vocational
Education.....3
- CTE 789
Internship.....2-6

**Will not lead to Elementary/
Secondary Principal
Certification*

EdFn 727 Group Processes.....3 SSu
A survey of small group constructs, research, and principles of application. Emphasis on learning methods and skills of group observation as well as developing knowledge of group roles and dynamics. Members will learn experimentally about groups by participating, observing and analyzing opportunities to experience their own behaviors and styles as they deem appropriate.

EdFn 730 Current Issues in Education3 FSSu
Analysis of current trends and issues in education. Focus on the change process in educational and social settings.

EdFn 745 Effective Teaching: Theory Into Practice3 SSu
Approaches instruction from the perspective of Effective Teaching Research integrated with a focus on thinking skills. Students study various instructional models, focus on selection and implementation of appropriate strategies and consider other classroom issues related to effective teaching.

EdFn 747 Curriculum: Theory and Practice2 FSu
A study of the nature and principles of curriculum and curriculum development in schools. Process of curriculum change, development and evaluation will be examined. Roles of teachers, administrators, students and the public in curriculum change will be studied. ELED 748 Elementary Curriculum Practicum or SEED 748 Secondary Curriculum Practicum is a corequisite.

EdFn 750 Technology in Education3 FSu
This course provides an advanced grounding in the educational uses of computing and communications technology. It includes integration of technology into the classroom, distance education, multimedia production, and school management systems.

EdFn 751 Teaching Reading Across Disciplines.....3 (alternate years)
Examines the latest research on how readers comprehend and learn from written texts, and the classroom applications of this research. Intended for teachers of content subjects (science, English, math, history, etc.) in grades 4 through the early years of college.

EdFn 752 Foundations of Reading3
Description of normal process of development in reading skills and techniques which may be used in remedying deviations which hinder readers in speed or comprehension. Recommended for graduate students in Language Skills and Communications programs.

EdFn 753 Diagnosis and Remediation of Reading Problems3
General nature of causes of reading disability; principles of diagnosis and use of instruments; basic principles of individual remediation; case studies; evaluation of progress of the disabled reader; adaptation of techniques to classroom. P, EPsy 302.

EdFn 754 Clinical Practice in Reading2 (on demand)
Supervised experience in utilizing best techniques and materials to effect desirable solution to reading difficulties; practical experience in writing case studies, in diagnosing reading disability. Proposing effective remediation, keeping records and in evaluating progress of student. P, EdFn 753 or concurrent. Written permission.

EdFn 782 Seminar1-3
Study in selected areas of Curriculum and Instruction which may include special investigations, student reports, student writing and discussion.

EdFn 789 Internship1-6
On-the-job participation in teaching in the public schools under the supervision of local school instructor and a staff member from the College of Education and Counseling.

Elementary Education (ELED) Course Offerings

ELED 581 Workshop1-3 FSSu
Special areas in elementary education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understanding in a current area.

ELED 748 Elementary Curriculum Practicum1 Su
Field-based problem-centered experience. EDAD 707 The Principalship is a corequisite.

ELED 773 Elementary School Curriculum3 Su
A study of the nature and principles of curriculum development in the elementary schools. Processes of curriculum change, development and evaluation will be examined. Roles of teachers, administrators, students and the public in curriculum change will be studied.

Educational Psychology (EPsy) Course Offerings

- EPsy 526 Psychology of the Early Adolescent Learner3 FSu**
 To guide students in the personal construction and application of an early adolescent development knowledge base. The learning environment of the early adolescent/ middle school student will be the context of study in this course. A theoretical base related to intellectual development, identity development, and social development will be used as a basis for exploring the benefits and needed changes in current educational settings of the 10-15 year old. Students will study the impact of various influences on the healthy and positive development of the learner. Students will apply the knowledge base to evaluate and critique personal experiences, issues, and programs designed for early adolescent learners. P, admitted to education program, junior standing (426) or graduate student (526).
- EPsy 550 Gifted and Talented3**
 Overview of the Gifted and Talented field; explores the development of gifted/talented children as well as identification and curriculum adaptations for meeting the needs of these children; also focuses on issues surrounding the parents and families of gifted and talented as well as program development and evaluation.
- EPsy 552 Enhancing Creativity3**
 Explores the various dimensions of creativity, including what it is, how it develops, how to teach creative students, and how to evaluate creative works. Emphasis will be on how to work with students who already exhibit significant creative abilities as well as how to foster creativity with all students.
- EPsy 630 Learning Disabilities3**
 Examines the identification and assessment of learning disabilities in students. Provides a variety of teaching and learning strategies. Includes both federal and state laws, rules, and guidelines.
- EPsy 740 Advanced Ed Psychology3 FSu**
 A study of theories of learning. The goal of the course is for each student to gain insight into their own beliefs about how learning occurs.
- EPsy 761 Testing Practicum: Intellectual Assessment2**
 A psychological testing practicum that focuses on intellectual assessment. The student learns to select, administer, score, and interpret the Wechsler scales as well as write a psychological report. P, CHRD 736, CHRD 755, and consent of instructor.
- EPsy 762 Testing Practicum: Personality Assessment3 FSu**
 A psychological testing practicum that focuses on objective personality assessment. The student learns to select, administer, score, and interpret the MMPI and the PIC as well as write a psychological report. P, CHRD 736, CHRD 755, and consent of instructor.
- EPsy 763 Testing Practicum: Projective Techniques2**
 A psychological testing practicum that focuses on projective techniques. The student learns to select, administer, score, and interpret the TAT, H-T-P and various other projective techniques as well as write a psychological report. P, CHRD 736, CHRD 755, and consent of instructor.

Science Teaching (SCST) Course Offerings

- SCST 601 Science in Our World..... 1-7 FSSu**
 This is an interdisciplinary course designed for the students to learn how to address scientific issues from the perspective of a biologist, chemist, physicist, mathematician, and educator. Issues of worldwide scientific importance are affected by many variables and changing one variable related to one of the above disciplines can impact one or several of the other disciplines. The course will be taught in a seminar format with discussion and debate as a primary strategy. Examples of the content to be covered will include but not be limited to modern measurement, and atoms to ecosystems.
- SCST 602 Modeling and Mathematics 2 FSSu**
 An introduction to mathematical models used to investigate scientific issues such as exponential growth and decay, ground-water contamination, air pollution, and hazardous material emergencies. Models will involve algebraic equations, systems of equations, calculus, probability, inferential statistics and computer simulations. The emphasis will be on fundamental principles and concepts of mathematical models and their incorporation into the secondary curriculum.
- SCST 782 Capstone 2 FSSu**
 This is the culminating course that involves the review of the content covered in the previous courses taken emphasizing the relationships between the disciplines. The students will be encouraged to construct an understanding that goes beyond a simple compilation of information. Strategies used may include but not be limited to internet study and application to their current classrooms and laboratories. This course will be team-taught involving faculty from the different disciplines.

Key to Course Descriptions

Course Number & Name
 Credits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Key to Course Descriptions

Course Number & Name
 Credits
 F = Fall
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 Su = Summer
 (Lecture Hours, Lab Hours)

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Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Secondary Education (SeEd) Course Offerings

- SeEd 581 Workshop** 1-3 FSSu
 Special areas in secondary education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understanding in a current area.
- SeEd 590 Special Topics**1-3 FSSu
 Advanced courses taught on demand covering such topics as questioning techniques, classroom management, systematic observations of teaching, school policy making, changing roles in education, computer applications, etc.
- SeEd 672 Motivation and Discipline** 3 FSSu
 Theories of motivation and discipline and their application in the classroom. Stresses techniques for preventing discipline problems, with emphasis upon ways to provide success experiences and positive reinforcement for students. Emphasizes effective procedures of group management as applied to the classroom situation. The course is appropriate for teachers, counselors, and administrative personnel.
- SeEd 682 Seminar**..... 1-3 FSSu
 Study in selected areas of education including special investigation, reports, and discussion.
- SeEd 691 Problems** 1-3 FSSu
 Directed reading and research in selected individual education topics.
- SeEd 740 Secondary School Curriculum** 3 FSSu
 A study of the nature and principles of curriculum development in the secondary schools. Process of curriculum change, development and evaluation will be examined. Roles of teachers, administrators, students and the public in curriculum change will be studied.
- SeEd 748 Secondary Curriculum Practicum** 1 FSSu
 Field-based problem-centered secondary curriculum development experience. EDFN 747 Curriculum: Theory and Practice is a corequisite.
- SeEd 792 Research Problems in Education**2 FSSu
 A problem is selected, analyzed, and reported in a form approved by the research advisor. *Required* of all graduate students in education qualifying for the degree under Option B. Can be *elected* under Option C if desired. P, consent.



Electrical Engineering

Degree Offered:

M.S. Engineering

- Electrical Engineering coursework concentration

Department Head: Professor Lewis F. Brown

Graduate Coordinator: Professor Robert G. Finch

For additional information contact:

Mailing address: SDSU Box 2220

Harding Hall — HH

WWW: <http://www.engineering.sdstate.edu/~eeweb/>

E-mail: Robert_Finch@sdstate.edu

Phone: 605/688-4526

Fax: 605/688-5880

Program Description

The Department of Electrical Engineering offers a variety of courses which can be used to fulfill the requirements for the Master of Science in Engineering degree. The courses encompass a broad range of studies including signal/image processing, biomedical engineering, power engineering, sensors, materials science, communications, and electronics. Each of these areas of study is strengthened by on-going research work conducted by the department's faculty. Additional courses are offered through EE 693 and EE 793 Special Topics in Electrical Engineering, and individualized instruction is available through EE 690 Special Electrical Problems.

Additional Admission Requirements

GRE: Required

TOEFL: Department requirement of 550

Refer to College of Engineering section, pages 78-80, for specific details.

Core Requirements

EE 615	Linear Systems Theory	3
EE 660	Electrical Properties of Materials	3
EE 670	Information and Signal Processing	3
EE 685	Microwave Theory	3
EE 700	Seminar	0
EE 701	Seminar	1

General Requirements begin on page 13 (Master's Degree). Graduate students should consult with their advisor before registering for graduate work.

Electrical Engineering (EE) Course Offerings

EE 515 Linear Control Systems.....	3
Feedback control systems by operational and differential methods. Topics may include differential and Laplace system modeling, Nyquist and Routh-Hurwitz stability analysis, and cascade PID/lead/lag and state-space feedback compensation design using root-locus, Bode and Ackermann's pole-placement methods. P, EE 316, Math 321.	
EE 516 Passive and Active Filters	3
The analysis and design of passive and active filters for electrical signals. Topics include Butterworth, Chebyshev, Bessel-Thompson response characteristics, biquad and Sallen-Key circuits, frequency and impedance transformations, sensitivity, gyrators, negative impedance elements, leap-frog filters and switched capacitor filters. P, EE 321 or consent.	
EE 524 RF Electronics	3
Performance analysis and design methods for the functional blocks of radio frequency systems operating below the microwave bands. P, EE 321, EE 316.	

Graduate Faculty

Alfred S. Andrawis
Associate Professor
Ph.D., Virginia Polytechnic
Institute and State University,
1991
Communications, Fiber Optics,
Microprocessors

Madeleine Y. Andrawis
Associate Professor
Ph.D., Virginia Polytechnic
Institute and State University,
1991
Electromagnetics, VLSI

Lewis F. Brown
Professor
Ph.D., Iowa State University,
1988
Electronic Materials,
Biomedical Engineering

Virgil G. Ellerbruch
Professor
Ph.D., University of Wyoming,
1969
Circuits, Electronics

Robert G. Finch
Professor
Ph.D., Purdue University, 1974
Digital Signal Processing, Data
Compression

David W. Galipeau
Associate Professor
Ph.D., University of Maine,
1992
Electronic Devices, Materials,
Microsensors

Dennis Helder
Professor
Ph.D., North Dakota State
University, 1991
Image and Signal Processing

Steven Hietpas
Associate Professor
Ph.D., Montana State
University, 1994
Controls, Power
Electronics/Systems

Michael E. Ropp
 Assistant Professor
 Ph.D., Georgia Institute of
 Technology, 1998
 Power Electronics, Electronic
 Devices, Energy Conversion
 & Control

EE 533 Computer Analysis of Power Systems	3
Concepts used in formulating load flow, fault study problems and stability analysis of power systems using computer solutions. P, EE 415/515, EE 430 or consent.	
EE 540 VLSI Circuit Design	2 F
An introduction to custom VLSI design in Complementary MOS (CMOS) technologies. Extensive use of computer software for VLSI circuit layout and simulation. P, EE 320, EE 345, EE 360.	
EE 540A VLSI Circuit Design Studio	1
EE 550 Biomedical Signal Processing	3
Methods and techniques for the analysis and processing of physiological signals. Off-line and real-time digital signal processing using time and frequency domain techniques. Emphasis on signal processing of electrocardiographic signals. P, EE 317.	
EE 554 Biomedical Instrumentation & Electrical Safety	3
The design of electronic instrumentation for physiological applications. Emphasis on modeling and design of biopotential electrode/amplifier systems, physiological measurement techniques, therapeutic and prosthetic devices, and electrical safety in health care facilities. P, EE 321.	
EE 560 Sensor Theory and Design	2 S
Introduction to the operation, design, testing and applications of modern sensors in use and under development. Signal conditioning and system integration are also reviewed. P, EE 360.	
EE 560A Sensor Theory and Design Lab	1
EE 570 Digital Communication Systems	3
Random signals, base-band transmissions, band-pass transmission, multiplexing, filtering, optimum detection, and information theory. P, EE 470 or consent.	
EE 571 Optical Fiber Communications	3
Theory and application of optical fibers and communication systems. Topics include fundamentals of optical fiber waveguides, electroluminescent sources, single-mode and multimode, propagation, coupling consideration, photo-detectors, signal degradation, fabrication and cabling, and transmission linked analysis. P, EE 316 or consent.	
EE 571A Fiber Optic Communications Lab I	0
This laboratory reinforces the theoretical concepts presented in the lecture course, EE 471-571. Topics include basic knowledge and skills needed for handling and testing optical fibers, characteristics of optical components, fiber optic communication systems and fiber optic sensing systems. P, concurrent with EE 471-571.	
EE 575 Digital Image Processing	3
Introduction to the fundamentals of digital image processing. Topics include image formation, transforms, enhancement, restoration, compression, and analysis. P, EE 317 or consent.	
EE 593 Special Topics in EE	1-3
Current topics in selected areas of engineering.	
EE 615 Linear Systems Theory	3
State variables, Laplace transform theory, matrix analysis and complex variable theory as applied to problems in circuit analysis. Topology, network theorems and network functions. P, consent.	
EE 620 Advanced Digital Hardware	3
Topics may include a deeper examination of fundamentals of combinational and sequential circuits, design for testability, advanced function implementation, design with current programmable technologies.	
EE 660 Electrical Properties of Materials	3
Topics covered will be concerned with electromigration, diffusion, theory of rate processes, relaxation effects, phase transformations, physics of dielectrics, and other topics associated with the physics of failure in electrical circuit applications. P, Math 331, Phys 331, EE 360 or consent.	
EE 670 Information & Signal Processing	3
Foundations of information theory and its relationship to the measure and transmission of information; comparison of analog and digital system implementations. Topics include random processes, signal representation, spectral analysis, channel capacity, rate distortion, coding, data compression, Z-transforms and digital filtering. P, EE 310, EE 316, or consent.	
EE 685 Microwave Theory	3
Transmission lines, resonant cavities, waveguide junctions, and components. Active devices, lasers, masers. P, EE 385.	
EE 690 Special Electrical Problems	1-3
P, consent.	

EE 693 Special Topics in Electrical Engineering	1-3
P, consent.	
EE 700-701 Seminar	0-1
EE 790 Thesis	1-7
EE 791 Thesis Sustaining	0
EE 792 Engineering Research or Design Paper	1-2 FSSu
EE 793 Special Topics in Electrical Engineering	1-3
EE 795 Engineering Research or Design Paper Sustaining	0
EE 797 Research	1-9 (repeatable P/F)

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Course Description as written
by department and approved by
the Board of Regents.

P = Prerequisite

Engineering

Degrees Offered:

Ph.D. Atmospheric, Environmental and Water Resources, *See page 36*

M.S. Engineering

- Agricultural and Biosystems Engineering coursework concentration, *See page 26*
- Civil and Environmental Engineering coursework concentration, *See page 49*
- Computer Science coursework concentration, *See page 55*
- Electrical Engineering coursework concentration, *See page 75*
- Mechanical Engineering coursework concentration, *See page 103*
- Physics coursework concentration, *See page 119*

M.S. Industrial Management, *See page 96*

Key to Course Descriptions

Course Number & Name

Credits

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S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Deans: Dr. Virgil G. Ellerbruch and Dr. Aelred Kurtenbach

For additional information contact:

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Crothers Engineering Hall — CEH

WWW: <http://www.engineering.sdstate.edu/>

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Master of Science in Engineering

The purpose of the Graduate Program in engineering is to provide the opportunity for an interdisciplinary education for engineers and scientists who will become leaders and experts in:

1. development and control of land, water and energy resources;
2. development and promotion of industrialization;
3. application of engineering principles to technological problems;
4. control of pollution and preservation of the environment.

See pages 15 (M.S.) and 18 (Ph.D.) for descriptions of available options.

Core Requirements for M.S. in Engineering

The formal course offerings for Master of Science in Engineering are divided into four groups:

1. Primary core
2. Secondary core
3. Supporting courses
4. Thesis or design/research paper

The **primary core** shall consist of at least seven (7) credits of graduate level courses chosen from subjects within the following areas: mathematics, physics, statistics, operations research, instrumentation, computer science, and seminar. These courses shall be chosen after consultation with the departmental advisor to give the students an advanced technical background to pursue research and advanced design. See each particular department section concerning the primary core courses.

The **secondary core** courses should be taken from those listed on page 80. These courses shall be taken to broaden the student's interdisciplinary background or to strengthen the student's background and ability to pursue research or advanced design. A minimum of 15 hours of course work must be taken from the primary and secondary core. These courses shall be determined by consultation with a departmental advisor.

The **supporting courses** can be chosen from a number of departments and colleges at SDSU to allow the student further specialization within a primary professional area in engineering or further developments of interdisciplinary interests.

The **thesis** provides research experience and a degree of specialization. This experience will help the student apply information learned in course work to the solution of practical problems which are of importance to South Dakota and the world.

The **design or research paper** will provide experience in searching the literature, applying theory to practice, considering economic factors, and considering the consequences of alternate solutions.

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Engineering Mechanics (EM) Course Offerings

- EM 521 Introduction to Mechanics of a Continuous Medium3**
General theory of a continuous medium. Kinematics of deformation and flow; stress tensors; conservation of mass, momentum and energy; invariance requirements; constitutive equations for solids and fluids; applications for special problems. P, 331, Math 331.
- EM 522 Theory of Elasticity3**
Analysis of stress and strain; equilibrium and compatibility equations; Hooke's law; fundamental problems in the theory of elasticity; plane-stress and plane-strain problems of the narrow beam, rotating discs and a plate with a circular hole. P, 321, Math 331 or equivalent.
- EM 523 Theory of Plasticity3**
Analysis of stress and strain; plastic behavior of materials; basic laws of plastic flow; applications to bending of beams, torsion of bars and thick-walled cylinders; slip line theory and its application to extrusion problems; limit analysis theorems and their applications to structural problems. P, 422-522 or consent.
- EM 624 Theory of Plates & Shells3**
Small-deflection theory of plates. Laterally-loaded rectangular plates. Navier and Levy solutions. Plates of various shapes, boundary conditions, and loading systems. Basic equations of the theory of shells. Design problems in cylindrical shells. P, EM 321, Math 321, Math 331, or consent.
- EM 631 Advanced Fluid Mechanics3**
Fundamental notions of continuum, stress at a point velocity field, and vorticity. General principles of kinematics and dynamics of a fluid. Potential flow and vortex motion. P, EM 331, Math 331 or equivalent.
- EM 641 Finite Element Analysis3**
Theoretical basis of the method of finite element analysis—an approximate method which analyzes problems using small, but finite elements rather than the infinitesimal elements of the calculus. Two- and three-dimensional stress analysis, plate bending and shell problems, static, dynamic and stability problems. Geometric and material non-linearities. Introduction to both heat and fluid flow problems. P, Math 321 and consent.

Key to Course Descriptions

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Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Key to Course Descriptions.

Course Number & Name
Credits
F = Fall
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P = Prerequisite

Secondary Core Courses

AE 512 Advanced Agricultural Tractors and Machines
AE 522 Bio-Environmental Engineering
AE 533 Advanced Irrigation Engineering
AE 554 Advanced Unit Operations in Food/Biomaterials Processing
AE 733 Ground Water Engineering in Ag
AE 772 Similitude
CEE 511 Bituminous Materials
CEE 524 Industrial Waste Treatment
CEE 536 Foundation Engineering
CEE 543 Matrix Analysis of Structures
CEE 547 Advanced Soils Engineering
CEE 552 Prestressed Concrete
CEE 632 Advanced Foundation Engineering
CEE 654 Advanced Design of Steel Structures
CEE 656 Advanced Reinforced Concrete Design
CEE 722 Hazardous/Toxic Waste Disposal
CEE 725 Biological Principles of Environmental Engineering
CEE 726 Physical/Chemical Principles in Environmental Engineering
CEE 728 Waste Water Treatment Plant Design
CEE 734 Surface Water Quality Modeling
CEE 765 Pavement Design
CEE 769 Design of Steel and Concrete Bridges
CSc 572 Artificial Intelligence
CSc 630 Principles of Data Base System Design
CSc 643 System Analysis and Design
CSc 705 Design and Analysis of Computer Algorithms
CSc 710 Structure and Design of Programming Languages
CSc 720 Theory of Computation
CSc 740 Management Information Systems
CSc 750 Recent Advances in Parallel Processing
CSc 770 Software Engineering Management
EE 615 Linear Systems Theory
EE 660 Electrical Properties of Materials
EE 670 Information and Signal Processing
EE 685 Microwave Theory
ME 514 Air Pollution Control
ME 527 Gas Dynamics I
ME 540 Computer-Aided Design
ME 603 Thermo-Fluid Energy Systems
ME 611 Advanced Heat Transfer I
ME 612 Convection Heat Transfer
ME 621 Viscous Flow I
ME 628 Gas Dynamics II
ME 631 Advanced Analytical Methods
ME 635 Modeling and Simulation
ME 639 Advanced Metallurgy
ME 641 Advanced Stress Analysis in Mechanical Design
ME 645 Advanced Machine Design
ME 662 Quality Control
ME 663 Topics in Reliability Engineering
ME 665 System Analysis
ME 667 Decision Theory
Phys 541 Science of Solids
Phys 743 Statistical Mechanics
Phys 751 Theoretical Mechanics

English

Degree Offered:
M.A. English

Department Head: Associate Professor Kathleen Donovan
Graduate Coordinator: Professor Mary Ryder

For additional information contact:

Mailing address: SDSU Box 504

Scobey Hall — SCO

WWW: <http://web.sdsu.edu/departments/english/>

E-mail: Mary_Ryder@sdsu.edu

Phone: 605/688-5191

Fax: 605/688-5192

Program Description

To be admitted into the M.A. Program in English, the applicant should have a minimum of 24 semester hours of undergraduate credit in English or receive the consent of the department head. A full-time student can complete the course requirements in one academic year. Graduate assistants should be able to complete these requirements in four semesters. Students may choose either Option A (thesis) or Option C (non-thesis).

Under Option A (thesis), the candidate is required to present a minimum of 30 hours of graduate work in one of the emphases listed, including 6 hours of thesis (Engl 790); at least 20 hours must be taken in residence. The candidate will present a thesis which reports the results of research directed by a member of the faculty in English. In an oral examination the candidate will be required to defend the thesis and to demonstrate knowledge relative to course work in the chosen emphasis.

The two areas of study for the M.A. degree in English are:

Studies in Literature: 24 semester credits mostly in literature with at least two courses in English literature and two in American literature, plus six hours of thesis. This emphasis is well suited to those who plan to continue toward the Ph.D. degree in literature or to enter college or community college teaching.

Studies in Language and Rhetoric: 24 semester credits mostly in composition, rhetoric, criticism, and linguistics, plus six hours of thesis. This emphasis is well suited to those who plan to teach in a community college or to pursue a Ph.D. degree in rhetoric or linguistics.

Either the literature emphasis or the language/rhetoric emphasis would offer appropriate advanced work for continuing secondary school teachers.

Under Option C, the candidate is required to complete **36 hours** of coursework in English followed by successful completion of written examinations under the direction of the Graduate Coordinator.

Available Options for Graduate Degrees

Master of Arts: Option A
Option C

See page 15 for descriptions of available options.

Graduate Faculty

Bruce Brandt
Professor
Ph.D., Harvard University,
1977
English Renaissance Literature

Kathleen Danker
Associate Professor
Ph.D., University of Nebraska-
Lincoln, 1985
*American, Native American
Literature*

Kathleen Donovan
Associate Professor
Ph.D., University of Arizona,
1994
Minority Literature

Margaret Duggan
Professor
Ph.D., Columbia University,
1972
English 18th Century Literature

David Evans
Professor and Writer in
Residence
M.F.A., University of Arkansas,
1976
Creative Writing

M.L. Flynn
Associate Professor
Ph.D., University of Missouri-
Columbia, 1985
English Romantic Literature

Michael Keller
Associate Professor
Ph.D., University of Illinois-
Chicago, 1993
Rhetoric

Karen A. Kildahl
Professor
Ph.D., University of
Washington, 1974
*English Contemporary
Literature*

Mary O'Connor
Associate Professor
Ph.D., University of California-
Los Angeles, 1992
*English Contemporary
Literature*

Mary Ryder
 Professor
 Ph.D., University of Illinois-
 Urbana, 1987
 American Literature

John Taylor
 Professor
 Ph.D., Indiana University-
 Bloomington, 1973
 Linguistics

Louis P. Williams
 Professor
 Ph.D., University of Minnesota,
 1976
 American Literature

Charles Woodard
 Distinguished Professor
 Ph.D., University of Oklahoma-
 Norman, 1975
 American, Native American
 Literature

Core Requirements

Engl 704, Introduction to Graduate Studies
 Reading knowledge of a modern foreign language or two years of undergraduate credit on the transcript.

Additional Admission Requirements

GRE: Required
 TOEFL: Department requirement of 600

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

English (Engl) Course Offerings

- Engl 522 Chaucer**3 (alternate years)
 Major works of Chaucer, with some attention to his sources and his language.
- Engl 523 Old & Middle English Literature**3 (alternate years)
 Emphasizing pre-Norman heroic and Christian literature, the work of Chaucer and his contemporaries, and folk literature such as the ballads.
- Engl 524 English Renaissance Literature**3 (alternate years)
 Major writers of the 16th and early 17th centuries excluding Shakespeare.
- Engl 527 Advanced Shakespeare**3 (alternate years)
 Selected plays of Shakespeare and significant Shakespearean criticism.
- Engl 528 Milton**3 (alternate years)
 Selected works of Milton, particularly *Paradise Lost*.
- Engl 531 English 18th Century Literature**3 (alternate years)
 Literature of the later 17th and 18th centuries (1660-1800), including major works and developments in literature and thought.
- Engl 532 English Romantic Literature**3 (alternate years)
 English literature of the romantic movement (1789-1832).
- Engl 536 English Victorian Literature**3 (alternate years)
 English literature of the Victorian Period (1840-1900).
- Engl 539 Modern English Literature to WWII**3 (alternate years)
 English literature from 1900 to WWII.
- Engl 540 Contemporary English Literature**3 (alternate years)
 English literature since WWII.
- Engl 553 American Renaissance Literature**3 (alternate years)
 American literature of the mid nineteenth-century, including the Transcendentalists and Romantics.
- Engl 554 American Realist & Naturalist Literature**3 (alternate years)
 American literature of the realist and naturalist movements of the late 19th and early 20th centuries.
- Engl 559 American Literature Between the Wars**3 (alternate years)
 American literature of the modernist movement from 1917 to 1945.
- Engl 560 Contemporary American Literature**3 (alternate years)
 American literature since WWII.
- Engl 563 Methods of Teaching English as a Second Language**3
 Develops the central concepts, tools of inquiry, and structure of teaching English to students with limited English proficiency. Includes the evaluation of instructional processes, learning resources, curriculum, and programs. Emphasis will be on teaching students to use English in educational and public settings. P, Ling/Educ 460/560. Cross-listed as EdFn 463/563.
- Engl 585 Advanced Creative Writing**3 (alternate years)
 A course allowing students with experience in creative writing to specialize in a particular genre (poetry, fiction, etc.). P, 383 or consent of instructor.
- Engl 704 Introduction to Graduate Studies**3
 An introduction to literary criticism and study of bibliographic tools (including electronic sources) and research methods needed for scholarly writing in the Humanities. Required of all candidates for the M.A. degree in English.

- Engl 705 Seminar in Teaching Composition3**
Study of the methods, theories, and history of writing instruction. A course for English GTAs and required of them.
- Engl 707 Speech/English/Drama for Teachers1-3**
Workshop sessions in various areas of English: linguistics, composition or literature. This is a concentrated course; it may not be taken concurrently with any other course. P, teaching experience or consent.
- Engl 710 Seminar in Rhetoric3**
Intensive study of selected periods or topics in rhetoric, with special emphasis on their relation to issues in criticism and composition.
- Engl 724 Seminar in English Literature to 16603 (alternate years)**
Intensive study of a selected type, theme, author, or period of English Literature from the beginning to 1660.
- Engl 725 Seminar in English Literature since 16603 (alternate years)**
Intensive study of a selected type, theme, author, or period of English literature since 1660.
- Engl 728 Seminar in American Literature to 19003 (alternate years)**
Intensive study of a selected type, theme, author, or period of American literature to 1900.
- Engl 729 Seminar in American Literature since 19003 (alternate years)**
Intensive study of a selected type, theme, author, or period of American literature since 1900.
- Engl 742 Seminar in American Indian Literature3 (alternate years)**
Intensive study of American Indian literature of the past or present with concentration on the Plains Indians.
- Engl 755 Seminar in Minority Literature.....3**
American literature of specific cultural or ethnic minorities other than Native American (African American, Asian American, Hispanic, Jewish, or woman writers, for example). May be repeated once with different content.
- Engl 790 Thesis1-7 (Pass/Fail)**
- Engl 791 Thesis Sustaining0 (Pass/Fail)**
- Engl 795 Independent Research & Study1-3**
Directed independent research. May be repeated to a total of 6 credits. P, consent of instructor and graduate advisor.
- Engl 797 Special Topics in Composition & Literature1-3**
Special Studies in various areas of writing, grammar, and literature. May be repeated to a total 6 credits. Given only with the permission of the Head of the Department of English.

Key to Course Descriptions

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Credits
F = Fall
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(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Linguistics (Ling) Course Offerings

- Ling 520 The New English3 (alternate years)**
Diverse new theories and applications in English linguistics: lexicography, pragmatics, stylistics, socio-semantics, semiotics, and discourse theory.
- Ling 525 The Structure of English3 (alternate years)**
Use of traditional, structural, and transformational grammars for describing the English language. Practical application in teaching. Strongly recommended for majors planning to teach.
- Ling 543 Development of the English Language3 (alternate years)**
Historical survey of phonology, grammar, syntax, and lexicon of English leading to an understanding of the present state of the language and future developments.
- Ling 552 General Semantics3 (alternate years)**
Relations between symbols; human behavior in reaction to symbols including unconscious attitudes, linguistics assumptions, and the objective systematization of language. Cross-listed with SpCm 552.
- Ling 560 Applied Linguistics for Teaching English as a Second Language3**
The study of social and linguistic structures which undergird different discourse forms. Emphasis will be on discourse forms which are particularly important for full participation in U.S. culture such as the rhetoric of public and school interactions. P, Ling 203 English Grammar or equivalent or instructor's permission. Cross-listed with EdFn 460/560.

Family and Consumer Sciences

Degree Offered:

M.S. Family and Consumer Sciences

- Child and Family Studies Option, *See page 94*
- Family Financial Planning Option, *See page 94*
- Nutrition and Food Science Option, *See page 112*

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

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(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Dean: Professor Laurie Stenberg Nichols

For additional information contact:

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Nursing/Family/A&S — NFA

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Fax: 605/688-4439

Program Description

The mission of the graduate program in Family and Consumer Sciences is to provide an in-depth, specialized program of study in Child and Family Studies, Family Financial Planning or Nutrition and Food Science. Graduate courses in Apparel Merchandising and Interior Design are inactive at this time. The degree granted is the Master of Science in Family and Consumer Sciences. An understanding of the research process is developed throughout graduate courses and other research requirements.

Available Options for Graduate Degrees

Master of Science: Option A

Option B

Option C

See page 15 for descriptions of available options.

Additional Admission Requirements

GRE: See each option for GRE requirements.

TOEFL: Department Requirements of 525

General Requirements begin on page 13 (Master's Degree). Graduate students should consult with their advisor before registering for graduate work.

Family and Consumer Sciences (FCS) Course Offerings

FCS 500 Practicum in Family Consumer Sciences2-6

Provides an opportunity for students to gain experience in a job or career related to their subject specialization. A learning plan is developed by the student and faculty member prior to the practicum. Consent of department and instructor is required.

FCS 592 Special Problems1-3

Individual research and study in family and consumer sciences. May be repeated for a total of 3 credits. Consent of instructor and department is required.

FCS 593 Current Topics1-3

For students needing additional study of a topic or experience not offered as part of a regular class.

FCS 601 Orientation to Graduate Study in Family & Consumer Sciences1 FSSu

An orientation to graduate studies in Family & Consumer Sciences including exposure to graduate procedures and policies as well as writing and referencing skills. Required of graduate majors in their first semester. Internet course.

FCS 700 Research Methods in Family/Consumer Science	4
Empirical methods of solving problems in Family and Consumer Sciences. Formulation of a research problem and plan. Evaluation of research reports. P, Stat course and consent.	
FCS 700A Research Methods in Family/Consumer Science Studio	0
FCS 790 Thesis	1-7
FCS 791 Thesis Sustaining	0
FCS 792 Special Problems	1-3
Individual research and study in Family and Consumer Sciences. P, consent of instructor.	
FCS 793 Current Topics	1-3
Study of contemporary issues and concerns in the Family and Consumer Sciences profession. Focus on topics related to FCS as an integrated profession and not included within the departments of the college. P, consent.	
FCS 794 Graduate Internship	1-7
FCS 795 Individual Research and Study	1-7
FCS 796 Individual Research Paper Sustaining	0
This course designation allows students to remain enrolled at SDSU while finishing reports associated with work completed for a Research Paper in Family and Consumer Sciences. P, FCS 795.	

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Family and Consumer Sciences Education (FCSE) Course Offerings

FCSE 592 Special Problems	1-3
Individual research and study in family and consumer sciences education. May be repeated for a total of 4 credits. Consent of instructor and department is required.	
FCSE 593 Current Topics	1-3
For students needing additional study of a topic or experience not offered as part of a regular class.	
FCSE 741 Supervision in Family and Consumer Sciences Education	2
FCSE 751 Curriculum in Family and Consumer Sciences Education	2
Cross-listed with CTE 751.	
FCSE 792 Special Problems	1-3
FCSE 793 Current Topics	1-3



Geography

Degree Offered:
M.S. Geography

Graduate Faculty

Donald J. Berg
Associate Professor
Ph.D., University of California,
Berkeley, 1976
Physical and Human
Geography

Charles F. Gritzner
Distinguished Professor
Ph.D., Louisiana State
University, 1969
Cultural Geography

Janet H. Gritzner
Professor
Ph.D., Louisiana State
University, 1978
Geographic Information
Systems

Edward P. Hogan
Professor
Ph.D., St. Louis University,
1969
Social Geography

Darrell E. Napton
Professor
Ph.D., University of Minnesota,
1987
Environmental Geography

Roger K. Sandness
Professor
Ph.D., University of Iowa, 1986
Quantitative and Physical
Geography

Department Head: Professor Roger K. Sandness

Graduate Coordinator: Distinguished Professor Charles F. Gritzner

For additional information contact:

Mailing address: SDSU Box 504

Scobey Hall — SCO

WWW: <http://www.geography.sdstate.edu/>

E-mail: Roger_Sandness@sdstate.edu

Charles_Gritzner@sdstate.edu

Phone: 605/688-4511

Fax: 605/688-4030

Program Description

The Department of Geography offers graduate students the opportunity to earn a Master of Science Degree. The curriculum, organized through formal courses, seminars, internship experiences, and supervised research, is designed to prepare students for positions in such professional areas as planning, remote sensing, geographic information sciences, government service, research, business, and teaching. The program is also designed to provide students with the education needed to pursue further graduate study.

Students seeking this degree are expected to select courses that will provide a sound foundation in geography (philosophical, physical and human, and research techniques) supported, if appropriate, by courses outside the department. Cognate areas beneficial to the student include History, Economics, Education, Biology, Engineering, Plant Science, Sociology, Wildlife and Fisheries, and others.

Special programs are offered for students interested in unique educational experiences. Among them are interdisciplinary minors in Planning and Geographic Information Systems. Other special programs can be taken through educational experiences provided for in the Alternatives and Options Programs of the College of Arts and Science, and a cooperative program with the EROS Data Center. Internships generally are available with planning districts, governmental agencies, business, and industry.

Available Options for Graduate Degrees

Master of Science: Option A
 Option B

See page 15 for descriptions of available options.

Core Requirements

Students are expected to take the following courses:

Geog 710	Evolution of Geographic Thought	3
Geog 714	Research and Writing	3

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Geography (Geog) Course Offerings

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

- Geog 506 Seminar in Systematic Geography: (Topical)1-4 FS**
Will deal with one or more aspects of human, economic, physical, population and historical geography or techniques. May be repeated for credit. The specific topic to be studied will change each semester.
- Geog 515 Environmental Geography3 S (even years)**
Geographical aspects of environmental issues including historical geography of environmental problems, global driving forces, land ethics and stewardship, environmental externalities, population, resources, climate change, and environmental restoration. Focus on connections between human and natural systems; consequence chains between cause and effect; impact of time and space on problem perception, analysis, and solution; and natural and human laws. Term Paper required.
- Geog 588 Geographic Information Systems II3 FS**
This course introduces advanced tools and techniques of data creation, data integration, mapping, and spatial analysis in geographic information systems (GIS). It provides basic approaches for solving problems of data integration including format identification, conversion, and registration. It gives a conceptual base to many methods and techniques associated with vector and raster-based spatial analysis. It provides an in-depth examination of the functions and capabilities of Arc View Desktop GIS, its extensions and ARC/INFO GIS software. It introduces basic concepts and practical applications of global positioning systems (GPS) technology in GIS especially in creating GIS-compatible data sets. This course gives hands-on experience with PC and UNIX workstations, tablet digitizers, scanners, printers and plotters, GPS equipment, digital camera systems and all supporting software. Students work with real applications and are expected to complete an individual/small group project during the course.
- Geog 589 Geographic Information Systems III3 S**
This course introduces many of the basic concepts of raster modeling in geographic information systems (GIS) with special emphasis on construction and use of digital elevation models (DEMs) in GIS. It provides an in-depth examination of the functions and capabilities of ArcView Desktop GIS extensions (Spatial Analyst and 3D Analyst) and ARC/INFO GRID GIS software. Building on the skills and techniques learned in the GIS I and GIS II courses, it gives a conceptual base to many of the quantitative methods associated with raster-based GIS spatial analysis. Topics include raster data formats and sources, data conversion, merging and projecting raster data sets, DEM displays including image drapes and other visualizations, overlay functions, hydrologic modeling tools and applications, visual analyses, friction and dispersion models and change detection studies. Students are expected to complete an individual/small group project in ArcView or ARC/INFO with a raster data component during the course.
- Geog 610 Topics in Geography Education1-4**
Studies in selected fields of geography with emphasis on elementary and secondary classroom applications. Course may be repeated for credit.
- Geog 620 Advanced Regional Studies in Geography: (Topical)1-4 FS**
Selected topics in the regional geography of continents, nations, or states. May be repeated for credit. Specific topic to be studied will change each semester.
- Geog 700 Seminar in Geography: (Topical)1-4**
Studies in selected geography fields. This course may be repeated for credit. The specific topic to be studied will change each semester.
- Geog 710 Evolution of Geographic Thought3 (every third semester)**
The history and development of geography and its theories, schools of thought, and current ideas.
- Geog 714 Research and Writing3 S (alternate semesters, alternate years)**
Development of geographic research and writing skills including a survey of data sources and literature, and preparation of reports, papers, articles, and the master's thesis.
- Geog 732 Geomorphology3**
Basic concepts of origin and development of land forms. Basic principles underlying the study of land forms; emphasis on processes shaping the natural landscape. Study of erosional and depositional processes operating at the earth's surface and land form resulting from these processes.
- Geog 734 Climatology3 S (odd years)**
Consideration of the exchange of energy and moisture and significance in human's utilization of the earth's surface. Climactic history of the earth. Hypotheses on climactic change. Inadvertent modification of climate.
- Geog 742 Cultural Geography3**
Consideration of culture in a geographic context including such concepts as cultural origins and diffusion, ecology, landscapes, and regions.

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

- Geog 752 Urban Geography**3 (every third semester)
Theoretical explanations of urban spatial patterns. Examination and application of contemporary theories, concepts, and methods to study urban geography problems. Theoretical explanations of urban spatial structure and spatial organization.
- Geog 765 Advanced Studies in Land Utilization: (Topical)**1-4 F (even years)
The physical and cultural factors affecting the nature and pattern of land utilization. Local and/or regional utilization, planning, and problems will be studied in detail in relation to the topic.
- Geog 770 Advanced Geographic Techniques: (Topical)**1-4 FS
Selected geographic techniques such as cartography, aerial photograph interpretation, remote sensing, information systems and map interpretation.
- Geog 785 Quantitative Methods in Geography**3 F
Descriptive and Inferential Statistics will be studied in this course. The traditional regression and correlation routines will be addressed as well as probabilities. Statistical routines on the mainframe computer will be utilized in problem solving involving real-world geographic-sociological situations.
- Geog 786 Geographic Information Systems**3 S
Practical application of GIS to problems and land-use planning, management of natural resources, transportation, as well as demographic data. Hands-on experience in the making of maps with computers, digitization, the storing and retrieving of geographic data, and the design of simple GIS.
- Geog 790 Thesis**1-7
- Geog 791 Thesis (Sustaining)**0
- Geog 792 Special Problems in Geography: (Topical)**1-4
Selected studies in geography to meet the needs of advanced students. Written permission of department head.
- Geog 793 Internship**1-3
Internship activity which promises to contribute significantly to the education of the student. Student will intern with various agencies such as the EROS Data Center, various planning agencies, etc. P, availability of internship openings.
- Geog 794 Research Paper in Geography**1-3
P, written permission of department head.
- Geog 795 Research Paper Sustaining**0 FSSu

Planning (Plan) Course Offerings

- Plan 571 Principles of State, Regional and Community Planning**3 F
Purpose, structure, and dynamics of the planning process. Identification of different types of planning. Inter-dependencies among persons who contribute to the planning process and are trained in separate academic disciplines. Basic techniques employed within different phases of the planning process. P, Enrollment within a minor in planning at the Master's level or consent.
- Plan 572 Techniques of State, Regional and Community Planning**..... 3 S
Brief review of basic approaches, procedures and methods employed within different phases of the planning process. Coordination required among persons trained in separate academic disciplines in order to carry out these basic techniques. Exercises in the practical application of selected techniques and review of their applications in ongoing to completed planning efforts. P, 691.

See also specialized courses in planning within departmental listings in Economics; Education; Engineering; Geography; Horticulture, Forestry, Landscape and Parks; Political Science; and Sociology.

Gerontology

Minor only offered

Dean of Family and Consumer Sciences: Professor Laurie Stenberg Nichols
Coordinator: Assistant Professor Renee Oscarson

For additional information contact:

Mailing address: SDSU Box 2275A

Nursing/Family/A&S — NFA

WWW: <http://www.abs.sdstate.edu/fcs/hdcf/gerontol.htm>

E-mail: Renee_Oscarson@sdstate.edu

Phone: 605/688-6418

Fax: 605/688-4888

Program Description

An interdisciplinary gerontology minor is available which requires a total of 10 credit hours. The 10 credits include 6 credits selected from the gerontology core listing plus 4 additional credits selected from courses having content related to elderly persons or the study of human beings. The plan of study for the gerontology minor must be approved by the gerontology coordinator. Seminars, current topics or special problems topics and credits vary by semester and must be approved by the Gerontology Committee.

Core Requirements

Bio 525	Biology of Aging	3
HDCF 614	Adult Development	3
NFS 761	Nutrition of the Aged	3
CHRD 571	Gerontology Issues in Counseling	3
AHEd 710	Adult Curriculum and Instruction	3
OR		
AHEd 711	Organization and Administration of Adult Education	3
GERO 592	Independent Study in Gerontology	1-3
GERO 593	Current Topics in Gerontology	1-3

Gerontology (Gero) Course Offerings

Gero 592 Independent Study in Gerontology1-3 FSSu
Individual study for quality students. May be repeated for a total of 4 credits. P, consent of instructor.

Gero 593 Current Topics in Gerontology1-3
Selected topics of current interest and concern in gerontology.

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite



Health, Physical Education and Recreation

Degree Offered:

M.S. Health, Physical Education and Recreation

- Sport Pedagogy emphasis (administration/management or teaching/coaching)
- Sports Science emphasis

Graduate Faculty

James Booher

Professor

Ph.D., University of Utah, 1976

Athletic Training, Sports

Medicine, Health

Anthony Clapp

Assistant Professor

Ph.D., University of Alabama,

1998

Exercise Physiology, Health

Promotion

Patty Hacker

Associate Professor

Ph.D., University of Wyoming,

1988

Teacher Education, Coaching,

Research

Fred Oien

Professor

Ed.D., University of

Massachusetts-Amherst, 1979

Athletic Administration,

Teacher Education

Matthew Vukovich

Assistant Professor

Ph.D., Ball State University,

1993

Exercise Physiology, Research

Department Head: Professor Fred Oien

Graduate Coordinator: Associate Professor Patty Hacker

For additional information contact:

Mailing address: SDSU Box 2820

Phone: 605/688-5625

Health/Physical Ed./Rec.Ctr. — PEC

Fax: 605/688-5999

WWW: <http://www.sdstate.edu/hp09/http/hper/hperhp.html>

E-mail: Patricia_Hacker@sdstate.edu

Program Description

The HPER Graduate Program exists to provide post-baccalaureate study opportunities leading to a Master of Science degree in Health, Physical Education and Recreation. The department philosophy is that graduate study at the master's level should be somewhat general with all students taking a common core of courses. However, in keeping with the guidelines of our national accrediting agencies (the National Association for Sport and Physical Education, and the National Council for the Accreditation of Teacher Education), students are afforded the opportunity to concentrate their studies in one of two areas of emphasis: 1) sports science or 2) sport pedagogy (administration/management or teaching/coaching). Our goal is to provide students with knowledge and experiences which will make them better professionals or which will prepare them for advanced study at the doctoral level.

Available Options for Graduate Degrees

Master of Science: Option A

Option B

See page 15 for descriptions of available options.

Core Requirements

HPER 783 Research Methods in HPER.....3

HPER 780 Seminar in HPER I and II.....2

Additional Admission Requirements

GRE: Required by the end of the second semester of enrollment—Department requirement of 900 combined scores (verbal & quantitative)

TOEFL: Department requirement of 700

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Health, Physical Education and Recreation (HPER) Course Offerings

HPER 581 Workshops in HPER1-3

Lectures, conferences, and outside assignments to increase understanding of a specific area.

HPER 682 Seminar in HPER..... 2 FSSu

Courses designed to address current topics or issues in the discipline.

HPER 742 Psychological Aspects of Sport and Exercise3 (alternate semesters)

Psychological theories and principles applied to physical education, sport, and exercise. Interpretation and analysis of human behavior. Topics include personality, arousal and anxiety, motivation, self-efficacy and self-esteem, attentional focus, audience effects, aggression, leadership, as well as intervention strategies. P, consent.

- HPER 745 Sports Medicine 2 (alternate semesters)**
 A review of the basic fundamentals of athletic training and exposure to recent developments in the sports medicine field. P, undergraduate Prevention and Care of Athletic Injuries or consent.
- HPER 760 Motor Learning & Development..... 3 (alternate semesters)**
 The study of human behavior as it relates to the learning and performance of motor skills. The understanding of motor learning as an essential foundation underlying the development of successful instruction and training strategies critical for skill acquisition. Laboratory work. P, consent.
- HPER 780 Seminar in HPER1 FS (Pass/Fail)**
 Two credits are required. Exploration of current research in HPER. Development of research ideas/proposals. Sharing and critiquing of proposals and findings. Development of critical thinking skills will be emphasized.
- HPER 783 Research Methods in HPER 3 S**
 By studying prevalent quantitative and qualitative research techniques, students will become critical consumers and potential producers of research relevant to Health, Physical Education and Recreation. Computer work, development of problems and hypotheses, writing professional papers. P, STAT 281 or equivalent or consent.
- HPER 790 Thesis1-3 FSSu**
- HPER 791 Thesis Sustaining..... 0 FSSu**
- HPER 792 Individual Research & Study in HPER1-3 FSSu**
 Directed independent research. May be taken for up to 3 credits. P/F grading, for Plan B students.
- HPER 793 Special Problems in HPER1-3 FSSu**
 Opportunity for students to investigate specific problems or areas not covered by coursework. Written report and oral examination required. P, consent.
- HPER 795 Design/Research Paper Sustaining0 FSSu**

Key to Course Descriptions

Course Number & Name
 Credits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Physical Education (PE) Course Offerings

- PE 550 Clinical Exercise Physiology2 (alternate semesters)**
 This course is designed to provide the clinical exercise physiology student with assessment and prescription techniques appropriate to special populations. P, consent.
- PE 730 Physical Education Teacher Education3 (alternate semesters)**
 Readings, lectures, and discussions designed to analyze the process of preparing physical educators for the teaching profession. Includes discussion of external influences, problems and possible solutions, socialization and effective teaching in the field. P, consent.
- PE 732 Analysis and Strategies of Teaching and Supervising Physical Education and Sport3 (alternate semesters)**
 Study and application of theoretical and practical knowledge of effective teaching/coaching, designed to improve teaching and coaching in physical education, including techniques of analysis and supervision. P, consent.
- PE 750 Applied Exercise Physiology3 F**
 Physiological basis of factors which influence physical fitness and physical performance; application of physiological measures to fitness programs, critical analysis of current literature; emphasis on bioenergetics, neuromuscular and circulorespiratory function, body composition and physical training. P, undergraduate Exercise Physiology.
- PE 751 Laboratory Techniques in Exercise Physiology2 (every 4th semester; alternate years)**
- PE 751A Laboratory Techniques in Exercise Physiology Lab0**
- PE 770 Advanced Administration of Interscholastic Athletics2 (alternate semesters)**
 Budgets, public relations problems, subsidization, objectives of athletics, staff organization, control of athletics, both interscholastic and intercollegiate, and general policies of athletics. P, consent.
- PE 771 Current Trends in HPER & Athletics..... 3 (alternate semesters)**
 The study of trends in athletics that affect the performance, safety, and attitude of athletes; administrative practices; and public perception and support of athletics.
- PE 772 Financial Aspects of Sports Management..... 2 F (alternate years)**
 A seminar-type course that gives the student interested in sports administration an opportunity to take an in-depth look into various areas of financial management. Examples of some of these areas, but not a complete list, are: Fund Raising, Guarantees, Budgeting, Scholarship Programs, TV and Radio Receipts, and Marketing.

History

Minor only offered

Graduate Faculty

David Crain
Professor
Ph.D., Indiana University-
Bloomington, 1972
Latin America, Germany

Michael Funchion
Professor
Ph.D., Loyola University-
Chicago, 1973
U.S. Immigration and Ethnic,
Britain and Ireland

John Miller
Professor
Ph.D., University of Wisconsin-
Madison, 1973
Recent United States

Jerry Sweeney
Professor
Ph.D., Kent State University,
1970
Diplomatic, Military

Department Head: Professor Jerry Sweeney
Graduate Coordinator: Professor Jerry Sweeney

For additional information contact:

Mailing address: SDSU Box 504

Scobey Hall — SCO

E-mail: Jerry_Sweeney@sdstate.edu

Phone: 605/688-4311

Fax: 605/688-6754

History (Hist) Course Offerings

Hist 560 Topics in History1-4

An intensive examination of significant historical themes, issues, or problems.

Hist 592 Special Problems in History1-3 FSSu

Selected studies for advanced students. Department consent required.

Horticulture, Forestry, Landscape & Parks

Degree Offered:

M.S. Biological Sciences, *See page 37*

- Horticultural Science emphasis

Department Head: Professor Peter Schaefer
Graduate Coordinator: Professor Peter Schaefer

For additional information contact:

Mailing address: SDSU Box 2140A

Northern Plains Biostress Laboratory — NPB

WWW: <http://www.abs.sdstate.edu/horti/hflp/hflp.htm>

E-mail: Peter_Schaefer@sdstate.edu

Phone: 605/688-5136

Fax: 605/688-4713

Horticulture (HO) Course Offerings

Ho 580 Environmental Stress Physiology3 S (even years)

Physiological and cellular response of plants to environmental stresses. P, Bot 327. Cross-listed with Bio 480/580 and PS 480/580.

Ho 590 Special Topics in Horticulture..... 1-3 FSSu

Students may receive small-group instruction in selected horticultural topics. P, consent.

Ho 746 Plant Breeding 3

Plant Breeding applied to field crops and horticultural varieties with particular emphasis on the relationship of genetics and allied subjects. Cross-listed with PS 746. P, PS 103, Bio 371, or consent.

Landscape Design (La) Course Offerings

La 560 Landscape Ecology.....4

Study of the structure, function and management of landscape ecosystems. Integrates the study of plants, animals and the physical environment at larger spatial scales, and application of these concepts to land management issues. P, Bio 211 or equivalent.

La 560A Landscape Ecology Lab.....0

Graduate Faculty

Anne Fennell

*Associate Professor of
Horticulture, Forestry,
Landscape and Parks
Ph.D., University of Minnesota-
Minneapolis/ St Paul, 1985
Molecular Biology, Stress
Physiology, Fruit Crop
Research*

W. Carter Johnson

*Professor of Horticulture,
Forestry, Landscape and
Parks
Ph.D., North Dakota State
University, 1971
General Ecology with
specialization in Forest and
Wetlands*

Peter R. Schaefer

*Professor of Horticulture,
Forestry, Landscape and
Parks
Ph.D., Michigan State
University, 1983
Forest Genetics*

Russell L. Stubbles

*Associate Professor of
Horticulture, Forestry,
Landscape and Parks
Ph.D., Texas A & M University,
1979
Forest Recreating Planning*

Human Development, Consumer and Family Sciences

Degree Offered:

M.S. Family and Consumer Sciences

- Child and Family Studies Option
- Family Financial Planning Option

Graduate Faculty

Bernadine Enevoldsen
Associate Professor
Ph.D., University of Minnesota,
1993
Consumer Affairs

Scott Gardner
Assistant Professor
Ph.D., Texas Tech University,
1995
Family Studies, Marriage and
Family Therapy

DeAnna Gilkerson
Associate Professor
Ph.D., Iowa State University,
1993
Early Childhood Education

Linda Good
Associate Professor
Ph.D., University of Minnesota,
1990
Early Childhood Education

Mary Kay Helling
Associate Professor
Ph.D., Purdue University, 1992
Early Childhood Education,
Family Support, Human
Development

Laurie Stenberg Nichols
Professor
Ph.D., The Ohio State
University, 1988
Family and Consumer Sciences
Education, Family Studies

Joseph White
Assistant Professor
Ph.D., Texas Tech University,
1997
Family Studies, Human
Development

Department Head: Associate Professor Mary Kay Helling
Graduate Coordinator: Associate Professor Mary Kay Helling

For additional information contact:

Mailing address: SDSU Box 2275A

Nursing/Family/A&S — NFA

WWW: <http://www.abs.sdstate.edu/fcs/hdcf/index.htm>

E-mail: Mary_Helling@sdstate.edu

Phone: 605/688-6418

Fax: 605/688-4888

Program Description

Courses offered in Human Development, Consumer and Family Sciences support the Master of Science in Family and Consumer Sciences degree program. Two options are available in Child and Family Studies and Family Financial Planning. Students within the Child and Family Studies option may choose either Early Childhood Education or Human Development and Family Studies as their area of emphasis or a general departmental emphasis.

Additional Admission Requirements

The Department requires all applicants to submit a statement indicating professional goals and how completion of a master's degree will assist in meeting these goals. This statement will be used for two purposes: first, to assess the fit between the student's educational/career goals and the academic program, and second, to assess the student's written communication skills. Refer to College of Family and Consumer Sciences section, pages 84-85, for specific details.

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Consumer Affairs (CA) Course Offerings

CA 593 Current Topics1-3
For students needing additional study of a topic or experience not offered as part of a regular class.

CA 620 Family Economics.....3 S (even years)
This course will cover the major issues relative to the economics of families including household production and human capital development. It will also cover the economics of crises, public policy and family life cycle spending, saving and borrowing. A theoretical and research perspective will be used to illuminate the concepts in the course. New and emerging issues in the field of family economics will be emphasized. Special attention will be given to the role of ethics in family economics issues through the course.

CA 792 Special Problems1-3

CA 793 Current Topics1-3

**Human Development, Child and Family Studies (HDCF)
Course Offerings**

- HDFS 557 Family Assessment3 FS**
Designed to introduce students to individual, family and community assessment tools that are used in prevention and intervention programs and approaches. P, Senior or graduate student standing.
- HDCF 592 Special Problems1-3 FSSu**
Individual study for quality students. P, consent of instructor.
- HDCF 593 Current Topics 1-3**
Study of current issues and concerns in human development, family therapy, and family studies. Focus on topics not included in other graduate courses in the department. P, consent. Can be repeated.
- HDCF 614 Adult Development3 F (alternate years)**
Study of research, theoretical adult development; physical, intellectual and personality development of the adult integrates issues of individual, family, gender, and career development and provides opportunity for application in working with adults.
- HDCF 665 Parent Education: Theory and Issues..... 3 (alternate years)**
Study of various approaches in parent education to become acquainted with programs and resources available, and to apply the knowledge in working with parents. Will involve the analysis of goals, trends, methods, and models of parent involvement and parent education.
- HDCF 676 Early Childhood Education, Administration and Practicum1-4**
Field experience with early childhood education (teaching, supervising, and administration). P, HDCF 327, 361, 362, 364, departmental consent.
- HDCF 702 Seminar 1-3 (on sufficient demand)**
Report and discussions of current literature, including research methodology in human development, family studies, and family therapy. Maximum of 4 credits may be applied to advanced degree. P, consent.
- HDCF 711 Child Development Theory and Application3 Su**
In-depth study of human development. Emphasis upon current theories and their application to an understanding of the developmental growth processes; relationship between cognitive, social, physical and emotional development and behavior; range of normality in growth and behavior. Focus on normal development but with consideration of impact of deviance from normative development on child, family, neighborhood.
- HDCF 742 Family Relations 3 F**
Current theoretical approaches to family interactions; impact of various forces (social, personal, intrapersonal) upon dynamic aspects of family relationships; patterns and sequences of coalitions and alliances; factors which result in stress and breakdown or enhanced and rewarding relationships. Emphasis upon normal families but family problems are also studied.
- HDCF 753 Family Public Policy..... 3 S (alternate years)**
The impact of the professional in shaping family policy and effecting positive family policy formation; study of family policy priority issues and alternative strategies.
- HDCF 777 Child and Family Counseling3Su (alternate years)**
Theory and philosophy of counseling and therapy with children and families using a family systems approach. P, instructor consent.
- HDCF 792 Special Problems 1-3**
Individual study for qualified students. P, consent.
- HDCF 793 Current Topics 1-3**
Study of current issues and concerns in human development, family therapy, and family studies. Focus on topics not included in other graduate courses in the department. P, consent. Can be repeated.

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Industrial Management

Degree Offered:

M.S. Industrial Management

Graduate Faculty

Reza Maleki
Professor
Ph.D., North Dakota State
University, 1989
Industrial Engineering and
Management

Department Head: Professor Reza Maleki

Graduate Coordinator: Professor Reza Maleki

For additional information contact:

Mailing address: SDSU Box 507

Wenona Hall — WEN

WWW: <http://www.engineering.sdstate.edu>

E-mail: Reza_Maleki@sdstate.edu

Phone: 605/688-6417

Fax: 605/688-5041

Program Description

The Master of Science in Industrial Management degree is offered through the College of Engineering as an integrated but multidisciplinary program designed to provide knowledge, skills, techniques and analytical tools necessary to effectively manage and understand the human, financial and technical aspects of complex operations within today's manufacturing and industrial organizations.

Studies may concentrate in manufacturing areas such as quality control, inventory management, materials handling, reliability, testing or production equipment design. Human resource management, product planning and design, safety, liability and product promotion, management leadership styles, motivation, etc., could be areas of special emphasis.

Core Requirements

Required courses for the major area of study must contain at least three (3) semester credit hours of work from four (4) of the five (5) following topic areas:

- Finance
- Manufacturing
- Quantitative Analysis Tools
- Management
- Management Information Systems

Suggested courses for each specific core topic area:

Management

Soc	533	Leadership and Group Organization.....	3
GE	543	Project Management.....	3
Econ	653	Advanced Market Research.....	3
Econ	782	Personnel and Labor Relations.....	3
EdAd	715	Supervision.....	3
CHRD	716	Human Resource Management in Business and Industry.....	3

Finance

Econ	610	Financial Management.....	3
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Manufacturing

GE	525	Risk/Loss Control Management.....	2
GE	610	Human Factors in Engineering and Design.....	3
GE	620	Industrial Safety.....	3
Econ	660	Operations Management.....	3
ME	662	Quality Control.....	3
HSc	533	Industrial Health.....	3

Quantitative Analysis Tools

Stat	581	Statistics for the Physical Sciences.....	3
ME	661	Operations Research.....	3
Econ	705	Econometrics.....	3

Management Information Systems

CSc	572	Artificial Intelligence.....	3
CSc	576	Computer Graphics.....	3
CSc	630	Principles of Data Base System Design.....	3
CSc	710	Structure and Design of Programming Languages.....	3
CSc	740	Management Information Systems.....	3

Additional Admission Requirements

GRE: Not required
 TOEFL: Industrial Management requirement of 550
 Refer to College of Engineering section, pages 78-80, for specific details.

General Engineering (GE) Course Offerings

- GE 525 Risk/Loss Control Management3 F**
 Industrial accidents are caused by error-making human beings. Safety results achieved only through "safety engineering" and OSHA compliance are limited. Optimum levels of accident prevention can only be achieved through a coordinated program of both safety engineering and safety management. The focus on modern safety management includes: management's direction of safety, measuring safety performance, behavior modification, motivating safety performance, profiling, program organization, products safety, and safety in the adjunct fleet.
- GE 543 Project Management3 S**
 Topics to be covered will include: Organization, Management Functions, Time Management, Scheduling, Trade-Off Analysis, Planning, Information Systems, Cost Controls, and International PM.
- GE 592 Special Engineering Problems1-3 FSSu**
 This course will provide individual students the opportunity to pursue technical design problems, extensive literature searches, and individual study of new and timely subjects within the fields of Physical Science and Engineering. P, junior or senior standing in Engineering and consent of instructor.
- GE 593 Special Topics in General Engineering1-3 FSSu**
 Timely topics relating to Physical Science and Engineering. P, junior or senior standing in Engineering and consent of instructor.
- GE 601 Technical Studies in Industrial Management3 F**
 An overview of the technical aspects of Industrial Management. Limits and derivatives of algebraic functions, definite integrals. Statistical methods and probability relating to engineering applications. Spread sheets and data base management systems as applied to the technical operating aspects in an industrial setting. P, consent of instructor.
- GE 603 Designing the Workplace for Production3**
 Designing the workplace to support the structuring of interpersonal communication and action in the workspace and to optimize the use of human energy through the total integration of corporate policy and culture with the physical environment. Includes the evaluation of operation procedures, the construction of behavior, computer assisted facilities management, developing control and order in the workplace, perceived stability as corporate support, flexibility as a catalyst to successful innovation.
- GE 610 Human Factors in Engineering and Design3**
 Human factors engineering (HFE), sometimes called ergonomics, deals with optimizing working and living conditions through designing for human use. The central approach of HFE involves the systematic application of relevant information about user characteristics, behavior and expectations in the design of man-made products, equipment, facilities, and environments. The objectives of HFE are (1) to enhance the effectiveness and efficiency of work and other human activities; and (2) to enhance the product user's comfort, safety, health and satisfaction. P, Math 102, junior standing or consent of instructor.
- GE 620 Industrial Safety3**
 Safety requirements and standards common to all industries and processes are reviewed. Attention is focused on legal safety requirements, particularly the Occupational Safety and Health Administration (OSHA) Standards. Emphasis is placed on how to recognize, evaluate, and control safety hazards associated with common industrial methods and technologies.
- GE 692 Special Problems in Engineering1-3 FS**
 Problems in engineering of mutual interest to graduate students and faculty. P, consent.
- GE 693 Special Topics in Engineering1-3 FS**
 Current topics in selected engineering areas. P, consent.
- GE 790 Thesis1-7**
- GE 791 Thesis Sustaining0**
- GE 792 Research Report/Design Paper1-2**
- GE 793 Special Topics in Engineering1-3**
- GE 795 Research or Design Paper Sustaining0**
- GE 797 Research1-9**

Key to Course Descriptions

Course Number & Name
 Credits
 F = Fall
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 (Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Journalism and Mass Communication

Degree Offered:

M.S. Communication Studies and Journalism

(See also Communication Studies and Theatre)

Graduate Faculty

Richard W. Lee
Professor
Ph.D., University of Iowa, 1972
Media Law, Media History,
Community Newspapers

Lyle D. Olson
Professor
Ed.D., Oklahoma State
University, 1988
Scholastic Press, Technical
Writing, Graphics and Design

Department Head: Professor Richard W. Lee
Graduate Coordinator: Professor Lyle D. Olson

For additional information contact:

Mailing address: SDSU Box 2235

Yeager Hall

WWW: <http://www.sdstate.edu/wjor/http/jpage.html>

E-mail: Richard_Lee@sdstate.edu

Lyle_Olson@sdstate.edu

Phone: 605/688-4171

Fax: 605/688-5034

Program Description

The graduate major in journalism is designed to provide for 1) professional journalists who wish to broaden their education in communications and social sciences; 2) for individuals with undergraduate degrees in non-journalism specialties who wish to develop their knowledge in mass communication.

Available Options for Graduate Degrees

Master of Science: Option A: Communication Studies

OR

Journalism

Option Descriptions

Communication Studies — Designed to provide advanced studies in the areas of public address, rhetorical theory, radio/television studies, and theatre arts. This option provides further professional preparation and competencies in the area of communication.

Journalism — Designed to provide for professional journalists who wish to broaden their education in communications and social sciences; and for individuals with undergraduate degrees in non-journalism specialties who wish to develop their knowledge in mass communication.

See page 15 for descriptions of available options.

Core Requirements

MCom 792 Research Methods in Communications

GCom 605 Current Approaches to Communication

SPCM 700 Instructional Methods in Communication (for teaching assistants)

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

General Communication (GCom) Course Offerings

- GCom 605 Current Approaches to Communication**3 S
Major theories of communication, including media and interpersonal communication.
- GCom 793 Special Topics in Communication**1-3 FSSu

Journalism and Mass Communication (MCom) Course Offerings

- MCom 505 Theories of Communications**3 S
Major theories of communication, including media and interpersonal communication.
- MCom 506 Public Opinion and Propaganda**3 S
Formation and measurement of public opinion; role of the media; propaganda techniques, agencies, theories.
- MCom 514 Mass Communication Law**3 FS
Libel, privacy, news gathering rights, and press freedom in America.
- MCom 515 Editorial Writing & Policy**2 F
Opinion function of periodicals; great editorials and editorial writers; writing editorials; shaping policy.
- MCom 516 Mass Media in Society**3 S
Rights and responsibilities of the press; relation of the media to individuals and society; role of media in a free society.
- MCom 517 History of Journalism**3 F
Development, impact, and importance of individual journalists and media in U.S.
- MCom 518 Women in Media**3 F
This course examines contributions of women to the mass media from colonial era to present. It also studies the portrayal of women by the news media and by advertising, and it studies the roles currently played by women in the media and in supporting areas of advertising and public relations.
- MCom 537 Educational Radio & TV**3
Preparation, presentation of educational and instructional materials for radio, TV, and film and classroom use. Cross-listed with RTVF 437-537.
- MCom 575 Public Relations**3 S
Interpreting institutional and industrial policies and programs to the public.
- MCom 576 International and Ethnic Advertising**3
This course develops an understanding of international and ethnic advertising and marketing. Students gain experience in marketing decisions that reflect an understanding of intercultural and international markets and explore the social and ethical issues in such marketing.
- MCom 581 Media Administration & Management**3 F
Business practices, newspaper, magazine, and broadcast management.
- MCom 653 Workshop in Communications**1-4 Su
Understanding and using media in the classroom; supervising school publications. For high school or college instructors and publication advisors.
- MCom 751 Special Problems in Communications**1-3 FSSu
Individual research and study in communication. May be repeated to a total of four credits in problems courses. P, consent.
- MCom 762 Special Problems in Radio, TV or Film**1-2
- MCom 790 Thesis**1-7 FSSu
- MCom 791 Thesis Sustaining**0 FSSu
- MCom 792 Research Methods in Communications**3 S
Application of social science research methods and techniques to the study of interpersonal and mass communication. Elementary statistical procedures.

Key to Course Descriptions

Course Number & Name

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(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Mathematics and Statistics

Degree Offered:

M.S. Mathematics

Graduate Faculty

Ross Kindermann

Professor

Ph.D., University of Illinois-
Urbana, 1978

Probability, Stochastic
Processes

Robert J. Lacher

Professor

D.A., University of Northern
Colorado, 1971

Topology, Statistics, Quality

Jan Vandever

Professor

Ph.D., University of North
Dakota, 1976

Measurement and Statistics

Timothy Wittig

Assistant Professor

Ph.D., Michigan State
University, 1981

Statistics

Kenneth Yocom

Professor

Ph.D., University of Wyoming,
1972

Number Theory, Abstract
Algebra

Department Head: Professor Kenneth Yocom

Graduate Coordinator: Professor Robert Lacher

For additional information contact:

Mailing address: SDSU Box 2220

Harding Hall — HH

WWW: <http://www.sdstate.edu/ma17http/mathstat.htm>

E-mail: Robert_Lacher@sdstate.edu

Phone: 605/688-6196

Fax: 605/688-5880

Program Description

The Master of Science in Mathematics prepares graduates for positions in industry, teaching, or doctoral programs.

Available Options for Graduate Degrees

Master of Science: Option A

Option B

Option C

See page 15 for descriptions of available options.

Core Requirements

All M.S. students must complete at least two of the following sequences:

Math 521, 522 Advanced Calculus I, II.....3, 3

Math 571, 672 Numerical Analysis I, II.....3, 3

Math 716, 717 Theory of Algebraic Structures I, II.....3, 3

Math 726, 727 Real Variables I, II.....3, 3

Math 728, 729 Complex Variables I, II.....3, 3

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Mathematics Teaching (MAST) Course Offerings

MAST 601 Mathematics Topics for Educators.....1-12 FSSu

This course is the hub course for the *Master of Education: Curriculum and Instruction; Mathematics Content Area*, degree. It is a course with credit value depending upon the number of mathematics topic areas in which a student enrolls, and can be repeated as many times as desired depending upon remaining topic areas. Topics will include but not be limited to: linear algebra, abstract algebra, discrete mathematics, probability, statistics, geometry and analysis. The hub sessions will meet in a seminar format to enable the discussion of mathematics topics not included in the current specific areas of the course, as well as a forum for allowing the students to discuss and learn the interrelationship between the various topic areas. All students registered for one or more mathematics topic areas are required to participate in all of the hub sessions.

Mathematics (Math) Course Offerings

Math 521 Advanced Calculus I3 F (on demand)

Elementary topology of \mathbb{R} and \mathbb{R}^n , continuity, differentiation and integration in \mathbb{R} and \mathbb{R}^n , infinite series of real numbers, uniform convergence. P, Math 225.

Math 522 Advanced Calculus II	3 S (on demand)
Power series, improper integrals, calculus of transformations from \mathbb{R}^n to \mathbb{R}^n , differential forms, vector analysis. P, Math 521.	
Math 523 Fractals and Chaos	3 F
An Internet course. In addition to the material covered in Math 423, more advanced concepts are introduced to prepare the student for an advanced course in chaotic dynamical systems and further work in the field. Additional topics include: invariant measures, Lyapunov exponents, and strange attractors in two or more dimensions. P, Math 123.	
Math 561 Intro to Topology	3 S (on demand)
A first course in point-set topology, covering the elementary concepts of metric and general topological spaces; closure, interior, boundary, connectedness, compactness, and separation. Special attention is given to continuity of functions.	
Math 566 Projective Geometry	3 S (on demand)
A synthetic and/or analytic approach to geometric properties invariant under projective transformations: Theorems of Desargues, Pascal, Brianchon and applications. P, Math 224 or consent of instructor.	
Math 571 Numerical Analysis	3 FSu
A survey of numerical methods including methods of interpolation, curve fitting, integration, solving equations (including differential equations with initial or boundary values). Errors of the methods are analyzed and the digital computer is used to apply the methods. P, Math 321.	
Math 591 Directed Studies	1-3 FSSu
Math 593 Special Topics	1-3
Topics of current interest not included in regular course offerings.	
Math 672 Numerical Analysis	3 S
Continuation of Math 571 including approximation theory, matrix iterative methods and boundary value problems for ordinary and partial differential equations. P, Math 571.	
Math 700 Seminar	1 FS (Pass/Fail)
Current Topics in Mathematical Research. Pass/Fail grading.	
Math 716 Theory of Algebraic Structures I	3 F (alternate years)
Abelian Groups, homomorphisms, permutation groups, Sylow theorems, group representations and characters. P, Math 313.	
Math 717 Theory of Algebraic Structures II	3 S (alternate years)
Rings, Modules, Fields, Galois theory, solvable groups, commutative rings and modules. P, Math 716.	
Math 726 Real Variables I	3 F (alternate years)
Set Theory, The Real Number System, Theory of Functions of a Real Variable, Lebesgue Measure, the Lebesgue Integral, Differentiation and Integration, Metric Spaces, Topological Spaces, Compact Spaces, Banach Spaces, Measure and Integration, The Daniell Integral, Topology, and Mappings of Measure Spaces.	
Math 727 Real Variables II	3 S (alternate years)
Math 728 Complex Variables I	3 F
Algebra of complex numbers, classifications of functions, differentiation, integration, mapping, transformations, infinite series. P, Math 225.	
Math 729 Complex Variables II	3 S
Continuation of Math 728, Laurent series, calculus of residues, conformal mapping, analytic continuation, Riemann surfaces, infinite products, special functions. P, Math 728.	
Math 731 Ordinary Differential Equations	3 S (on demand)
Existence theorems for solutions of ordinary differential equations, theory of linear differential equations and systems of linear differential equations oscillation theory. P, Math 321.	
Math 732 Partial Differential Equations	3 F
Series, solutions, total differential equations, simultaneous equations, approximate solutions, partial differential equations of first and second orders, application. P, Math 321.	
Math 770 Numerical Linear Algebra	3 S (alternate years)
Analysis of numerical methods for solving linear systems of equations. Methods for solving underdetermined and overdetermined systems. Methods for numerically calculating eigenvalues and eigenvectors of symmetric and non-symmetric matrices. P, knowledge of a programming language and of matrix algebra.	

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Key to Course Descriptions

Course Number & Name
 Credits
 F = Fall
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 (Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Math 780 Advanced Mathematics1-18 FSSu
 This course is the hub course for the Master of Science Degree in Mathematics. Each term several modules will be offered and students may enroll in one or more of the modules. Modules will include but not be limited to: abstract algebra, real analysis, complex analysis, ordinary differential equations and partial differential equations. Students will meet together one hour each week in a seminar format and will meet one hour per week for each credit of theoretical mathematics in which they are enrolled. Students may enroll in the course as many times as desired provided they do not duplicate any modules. Students in the MS in Mathematics will be required to complete at least 12 credits of Math 780 as part of their plan of study.

Math 784 Applied Probability Theory3 S (on demand)
 Topics in probability including an introduction to the axiomatic development of probability, random variables and distributions with emphasis on the exponential, binomial and Poisson distributions. Applications to discrete stochastic processes such as Markov chains and queuing theory are covered in some detail. P, Math 381 or consent.

Math 790 Thesis1-7 FSSu (Pass/Fail)

Math 791 Thesis Sustaining0 FSSu (Pass/Fail)

Math 792 Research Paper1-2 FSSu

Math 793 Advanced Topics1-3 FSSu

Math 794 Research Paper Sustaining0

Math 795 Special Problems1-3 FSSu

Math 797 Research1-9

Statistics (Stat) Course Offerings

Stat 541 Statistical Methods II3 FSSu
 Analysis of variance, various types of regression, and other statistical techniques and distributions. Sections offered in the areas of Biological Science and Social Science. P, Stat 341 or Math 381. Credit not given for both Stat 541 and Stat 581.

Stat 545 Nonparametric Statistics 3 F
 Covers many standard nonparametric methods of analysis. Methods will be compared with one another and with parametric methods where applicable. Attention will be given to: (1) analogies with regression and ANOVA; (2) emphasis on construction of tests tailored to specific problems; and (3) logistic analysis. P, Stat 341 or Math 381.

Stat 581 Statistics for the Physical Sciences 3 FS
 Analysis of variance, various types of regression, and other statistical techniques and distributions. P, Math 381. Credit not given for both Stat 541 and Stat 581.

Stat 591 Directed Studies.....1-3 FSSu

Stat 662 Quality Control 3 FS
 Application of statistical techniques to the control of quality and the development of economical inspection methods. Collection, analysis, and interpretation of operations data; control charts and sampling procedure. P, Stat 341 or Math 381. Cross-listed with ME 662.

Stat 751 Interpretation of Statistical Software Output2 S
 Interpretation of statistical software package(s) include statistics such as correlation, means, standard deviation, standard error, t-test, chi-square, simple and multiple linear and curvilinear regression, and balanced and unbalanced analysis of variance. P, Stat 541 or Stat 581, CSc 210 or 410 or consent of instructor.

Stat 761 Experimental Design3 S
 Experimental designs involving confounding, factorial experiments, incomplete block, lattice, incomplete latin square designs, combining experiments, and discriminant analysis. P, Stat 541 or Stat 581.

Stat 780 Advanced Statistical Methods 1-18 FSSu
 This course is a hub course in statistics for graduate students. Each term several modules will be offered and students may enroll in one or more of the modules. Modules will include but not be limited to: regression methods, multivariate methods, categorical data analysis, interpretation of statistical output, and experimental design. Students will meet together one hour each week in a seminar format and will meet one hour per week for each credit of advanced statistical methods in which they are enrolled. Students may enroll in the course as many times as desired provided they do not duplicate any modules.

Stat 792 Special Topics in Statistics 1-3
 Advanced study of one or more selected topics as student need justifies; for example, sampling, statistical genetics, multivariate statistics. P, Stat 541 or Stat 581.

Mechanical Engineering

Degree Offered:

M.S. Engineering

- Mechanical Engineering coursework concentration

Department Head: Professor Don Froehlich
Graduate Coordinator: Professor Don Froehlich

For additional information contact:

Mailing address: SDSU Box 2219

Crothers Engineering Hall — CEH

WWW: <http://www.sdstate.edu/mezo>

E-mail: Don_Froehlich@sdstate.edu

Phone: 605/688-5426

Fax: 605/688-5878

Program Description

The Mechanical Engineering Department offers courses for the degree Master of Science in Engineering. Also, course offerings can be used in co-major or minor programs for students of other departments. The graduate program in engineering with a study area of M.E. emphasizes advanced study, including design and research, in such areas as thermofluid science, solid mechanics and dynamics, and industrial and quality control engineering. Students are encouraged to broaden their education by participating in supporting programs in established departments such as mathematics, computer science and other fields of engineering.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525

Refer to College of Engineering section, pages 78-80, for specific details.

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Mechanical Engineering (ME) Course Offerings

ME 514 Air Pollution Control3

Control of particulates and gaseous pollutants. Design and operating characteristics of gravity settlers, cyclones, electrostatic precipitators, fabric filters, scrubbers, incinerators, adsorption beds and absorption towers. P, 311 or consent.

ME 527 Gas Dynamics I3

Objectives, applications, and scope of the subject. Methods of fluid dynamics and thermodynamics. Compressible flow in ducts, nozzles and diffusers. Propagation of plane waves; shock dynamics, characteristics, interaction of waves. General theorems of gas dynamics. P, EM 331, Math 331.

ME 540 Computer-Aided Design3

The use of digital computer as a design tool. Techniques and algorithms which increase the rationality of the design process. Design principles and optimization theory. General approach to constrained optimization. Probabilistic approaches to design. Computer-aided design to reliability specification. Application of computer graphics to engineering design. The emphasis is on extending the designer's potential and not on automating those activities. P, competence in FORTRAN programming and consent.

ME 593 Special Topics1-3

Graduate Faculty

Kurt Bassett

Associate Professor

Ph.D., North Dakota State University, 1995

Mechanical Systems, Energy Analysis

Fereidoon Delfanian

Associate Professor

Ph.D., North Dakota State University, 1995

Computational Fluid Dynamics, Indoor Air Quality, HVAC

Donell Froehlich

Professor

Ph.D., Cornell University, 1976

Industrial, Mechanical Design

Hassan Ghazi

Professor

Ph.D., The Ohio State University, 1962

Thermodynamics, Heat Transfer

Hamid Hamidzadeh

Professor

Ph.D., Imperial College

(University of London), 1978
Mechanics, Dynamic Systems

Alexandros Moutsoglou

Professor

Ph.D., University of Missouri-Rolla, 1977

Thermofluid Energy Systems

Charles Remund

Professor

Ph.D., University of Nebraska-Lincoln, 1988

Thermofluids, Systems

Jeffrey Welsh

Assistant Professor

Ph.D., University of Wyoming, 1999

Materials, Mechanics

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

ME 603 Thermo-Fluid Energy Systems	3
Review of viscous fluid, basic modes of heat transfer, thermodynamics, and energy conversion. Discussion of energy sources, uses, conversion, transmission, and economics. Analysis of conventional energy generation, storage, and transmission systems, criteria for design and analysis of energy systems such as nuclear, wind, solar, geothermal, etc.	
ME 606 Statistical Thermodynamics	3
Review of classical thermodynamics. Principles of kinetic theory and classical statistical mechanics. Principles of quantum mechanics, quantum statistics, partition functions, and thermodynamic properties.	
ME 611 Advanced Heat Transfer I	3
Review of principles of heat conduction. Multidimensional steady and transient heat conduction in cartesian and cylindrical coordinates. Separation of variables and integral transforms. Review of principles of radiation. Spectral and directional radiative properties. Gaseous radiation. Radiative transport equation.	
ME 612 Convection Heat Transfer	3
Scale Analysis. Laminar Boundary Layer flow. Laminar duct flow. Laminar natural convection. Natural convection in enclosures. Turbulent boundary layer flow. Turbulent duct flow.	
ME 621 Viscous Flow I	3
Review of fluid motion with friction. Boundary layer theory. Exact solutions of the Navier-Stokes equations. Creeping flow and the theory of lubrication. Exact similarity solutions and approximate integral methods for boundary layer flow. Wall turbulence. Logarithmic law of the wall. Mixing length model.	
ME 628 Gas Dynamics II	3
Flow with mass addition. Combustion Waves. Generalized one-dimensional flow. Flow with small perturbations. Multidimensional flow. Method of characteristics applied to steady and unsteady flows.	
ME 631 Advanced Analytical Methods	3
Differential systems related to practical engineering problems. Linear ordinary differential equations. Series solutions; Fourier series. Partial differential equations: parabolic, elliptic, hyperbolic. Integral equations.	
ME 635 Modeling & Simulation	3
A systems approach to the analysis of electrical, mechanical and hydraulic systems. Generalized modeling methods, governing equations, system response, synthesis and design of dynamic systems, and specific applications of modeling technique.	
ME 635A Modeling & Simulation Lab	0
ME 639 Advanced Metallurgy	3
Crystal lattices and diffraction by crystals. Structure determination, defects, registration by microscopic methods, single crystal orientation and analysis of stress caused by phase transformation.	
ME 641 Advanced Stress Analysis in Mechanical Design	3
Introduction to the theory of elasticity. Equilibrium equations, boundary conditions and compatibility relations. Plane stress and strain. Torsion and curved beams. Rectangular and polar-coordinates. Axisymmetric problems. Energy methods. Introduction to Finite Element method.	
ME 645 Advanced Machine Design	3
Experimental, empirical and analytical methods in advanced design. Thermal stresses. Stability. Theories of failure. Creep and fatigue considerations. Introduction to fracture mechanics. Plates and shells.	
ME 661 Operations Research	3
History and organization of operations research, mathematical and statistical models in industrial decisions. The evaluation of alternatives by means of linear programming, queuing theory, deterministic and stochastic inventory models, game theory and simulation.	
ME 662 Quality Control	3
Application of statistical techniques to the control of quality and the development of economical inspection methods. Collection analysis, and interpretation of operations data; control charts and sampling procedure. Cross-listed with Stat 662.	

ME 663 Topics in Reliability Engineering	3
Probability concepts and typical models involved in the statistical prediction of reliability. Methods for estimating required parameters from experimental data. Reliability and maintainability techniques in practice, and a survey of recent developments in the field.	
ME 665 System Analysis	3
Analysis of industrial problems as systems of servicing stations with deterministic and stochastic inputs and service times using queuing theory as a principal approach. Development of theoretical models. Digital computer simulation of complex systems.	
ME 667 Decision Theory	3
Examination and evaluation of modern techniques of decision making. Mathematical models and measurement theory. Certainty, risk, and uncertainty.	
ME 690 Special Problems	1-5
Provides an opportunity for study or investigation of special problems or project at graduate level. P, or consent.	
ME 695 Special Topics	1-3
ME 700-701 Seminar	0-1
ME 790 Thesis	1-7
ME 791 Thesis Sustaining	0
ME 792 Research or Design Paper	1-2
ME 793 Engineering Research or Design Paper Sustaining	0
ME 794 Special Problems	1-3
ME 795 Special Topics	1-3
ME 797 Research	1-9

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Modern Languages

Coursework only offered

Graduate Faculty

Philip Baker
Professor of Modern
Languages
Ph.D., Florida State University,
1973
Latin American & Spanish
Culture, Hispanic Studies

Anthony H. Richter
Professor of Modern
Languages
Ph.D., Northwestern University,
1971
German Literature, Russian-
German Immigrants

Department Head: Professor Philip Baker

For additional information contact:

Mailing address: SDSU Box 2275
Nursing/Family/A&S — NFA
WWW: <http://www.sdstate.edu/wflg/http/index.htm>
E-mail: Philip_Baker@sdstate.edu

Phone: 605/688-5101
Fax: 605/688-6699

Modern Languages (ML) Course Offerings

- ML 560 Topics in French, German or Spanish Literature1-4**
An intensive examination of a significant writer(s), period or theme in French, German, or Spanish literature. This course may be repeated for credit if topic is different.
- ML 592 Special Problems1-3**
- ML 593 Special Topics in Language and Culture1-3**
- ML 595 Graduate Level Living and Study Abroad.....1-6**

French (Fren) Course Offerings

- Fren 592 Directed Readings/Independent Study1-3**

German (Germ) Course Offerings

- Germ 592 Special Problems1-3 FSSu (alternate years)**
This course gives graduate students the opportunity to do individualized and/or independent study in German.

Spanish (Span) Course Offerings

- Span 592 Special Problems1-3**
This course gives graduate students the opportunity to do individualized, and/or independent study in Spanish.

Music

Minor only offered

Department Head: Professor Corliss Johnson
Graduate Coordinator: Professor Corliss Johnson

For additional information contact:

Mailing address: SDSU Box 2212

Lincoln Music Hall — LMH

WWW: <http://www.sdstate.edu/music>

E-mail: Corliss_Johnson@sdstate.edu

Phone: 605/688-5188

Fax: 605/688-4307

Graduate Faculty

Corliss Johnson

Professor

D.M.A., University of

Colorado-Boulder, 1972

Director of Jazz Activities,

Clarinet, Saxophone

Music (Mus) Course Offerings

Mus 592 Independent Studies1-3

Consent. May be used as substitute for music requirement.

Mus 593 Course Specials1-5

Nursing

Degree Offered:
M.S. Nursing

Graduate Faculty

Paula P. Carson
Associate Professor
Ph.D., University of Arizona,
1992

Gloria P. Craig
Assistant Professor
Ed.D., Drake University, 1997

Kay Foland
Associate Professor
Ph.D., University of Texas-
Austin, 1989

Margaret Hegge
Distinguished Professor
Ed.D., University of South
Dakota, 1983

Lori D. Hendrickx
Associate Professor
Ed.D., University of Montana,
1998

Marylou Mylant
Associate Professor
Ph.D., University of Texas-
Austin, 1988

Roberta K. Olson
Professor
Ph.D., St. Louis University,
1984

Carol J. Peterson
Professor
Ph.D., University of Minnesota-
Minneapolis/St. Paul, 1969

Penny Powers
Associate Professor
Ph.D., University of
Washington, 1994

Patricia A. Smyer
Associate Professor
D.Nsc., University of
California, 1994

Dianna Sorenson
Associate Professor
Ph.D., University of Arizona,
1990

Judith A. Vinson
Assistant Professor
Ph.D., St. Louis University,
1996

Dean: Professor Roberta K. Olson

Graduate Nursing Department Head: Associate Professor Penny Powers

For additional information contact:

Mailing address: SDSU Box 2275

Phone: 605/688-4114

Nursing/Family/A&S — NFA

Fax: 605/688-6073

WWW: <http://www.sdstate.edu/~http/http/sdsuinfo/colleges/nursing.html>

E-mail: Sheila_Stotz@sdstate.edu

Program Description

The purpose of graduate education in nursing is to prepare professional leaders with specialized knowledge and skills to meet the nation's needs in clinical practice, nursing administration, and nursing education. The aim of the program is to prepare nurses to practice at an advanced level in nursing in the functional roles of either nurse educator, administrator, or clinician which includes clinical nurse specialist, neonatal nurse practitioner, or family nurse practitioner. Achievement of this aim includes study in related fields and the use of research in the examination of nursing problems. Students focus on the clinical tracks of adult/gerontology or family/parent-child.

Program Objectives

The graduate of the Master of Science in Nursing program will:

1. Incorporate knowledge and theories from nursing and other supportive disciplines into advanced nursing practice.
2. Display competence within the legal scope of practice for the chosen functional role.
3. Evaluate, conduct, and utilize research within advanced practice nursing.
4. Use leadership, administration, and teaching strategies to improve nursing practice and health care delivery.
5. Assume accountability to influence health policy, improve health care delivery, address the diversity of health care needs, and advance the nursing profession.

Available Options for Graduate Degrees

Master of Science: Option A

Option B

See page 15 for descriptions of available options.

Core Requirements

See sidebar on page 109 for required core courses for all students.

Functional Role Courses

See sidebar on page 110 for a list of these courses.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525

In addition to meeting basic requirements for admission to the Graduate School, applicants for graduate study in nursing must have:

1. Applicants for the M.S. in Nursing must also submit an additional application to the Nursing program and the Immunization and Physical Examination Form. These documents may be requested from the College of Nursing, SDSU, Box 2275, Brookings, SD, 57007. Telephone 605/688-4114.
2. Bachelor's degree in nursing from an accredited program with an upper division major in nursing with a "B" average (3.0 or higher on a 4.0 point grading system).
3. Current licensure as an RN or eligibility for licensure.

4. Professional nursing liability insurance.
5. 1500 hours of nursing practice experience.
6. An approved course in statistics.

Total enrollment in the Master of Science in Nursing program may vary depending upon available clinical facilities and qualified faculty and funds. Applicants are selected competitively from those best qualified for the master's program. Applicants should check with the Nursing office for application deadlines.

Graduate students should consult with their advisor before registering for graduate work.

Health Science (HSc) Course Offerings

HSc 533 Industrial Health3 (odd years)
 Industrial hygiene deals with the scope, objectives, and functions of occupational health programs, examines work related diseases, harmful exposure to chemicals and physical agents which may cause discomfort, stress, inefficiency or disease; emphasis on preventive measures to assure a reasonably healthful work environment.

Nursing (Nurs) Course Offerings

Nurs 610 Advanced Practice Nursing: Introduction Roles and Issues3
 Introduction to advanced nursing practice. Theoretical bases for education, administration, clinical practice roles and research as a basis for advanced nursing practice will be emphasized. Health care delivery systems, economic impacts, work management, ethics and leadership will be addressed. Philosophical principles of biomedical ethics will be introduced for advanced nursing practice. Change theory and application, and communication skills with professionals and consumers (individuals and groups) will be included.

Nurs 623 Pathophysiology Applied to Advanced Practice Nursing4
 Pathophysiological concepts relevant to the mechanisms of disease that provide the foundation for clinical assessment, decision-making, and management. P or concurrent, Nurs 610.

Nurs 624 Neonatal Pathophysiology4
 Embryology of the major organ systems as well as specific physiologic and pathophysiologic processes relevant to the neonate and convalescing infant will be studied. Emphasis placed on the relationship among pathophysiology, clinical nursing problems, and decision-making. P, Nurs 610.

Nurs 625 Human Sexuality in Health Care3
 Provides the opportunity to identify, study and discuss those areas in human sexuality which concern human interaction and in particular the work with clients and their families in health care. P, graduate student in nursing; graduate student in other disciplines with consent of instructor.

Nurs 626 Advanced Nursing Research3
 The primary focus of this course is the development of knowledge and skills to conduct research. Specific emphases are: research methods, critique of studies for scientific merit, development and conduct of research, interpretation, dissemination and application of research findings to advanced nursing practice. P, Nurs 610.

Nurs 630 Advanced Assessment of Neonate3
 Development of systematic assessment skills to evaluate the critically ill neonate and family from physical, physiologic, developmental, behavioral and psychosocial perspective. Assessment, laboratory, and other data will be correlated in the environmental context. P or concurrent, Nurs 610.

Nurs 630A Advanced Assessment of Neonate Clinical Lab0

Nurs 631 Advanced Assessment Across the Lifespan3 Su
 This course builds on basic skills of individual health assessment. It includes the advanced assessment of physiological and psychological processes relevant to the health of a variety of cultural, gender and age related groups, including the assessment of selected human pathologies. Skills and tools necessary to identify health care needs and health maintenance protocols will be included.

Nurs 631A Advanced Assessment Across the Lifespan Clinical Lab0

Nurs 635 Dying, Death, and Bereavement3
 Provides an overview of dying, death, and bereavement. Self-examination of these issues will be encouraged. An understanding of the specific needs of both dying and bereaved children and adults and appropriate interventions will be covered. This course will also provide students with an overview of some of the most current research and literature in the areas of dying, death, and bereavement. P, graduate students in nursing, other graduate students with instructor's consent.

Howard E. Wey
 Associate Professor
 Ph.D., University of Cincinnati
 College of Medicine, 1980

Required Core Courses for All Students

- Nurs 610 Advanced Practice: Nursing Introduction to Roles and Issues*
Nurs 626 Advanced Nursing Research
Nurs 670 Health Policy, Legislation, Economics and Ethics

Functional Role Courses

For Educator

Nurs 778 Nurse Educator:
Practicum

For Administrator

Nurs 774 Nurse
Administrator:
Practicum

For Clinical Nurse Specialist

Nurs 770 Clinical Nurse
Specialist:
Practicum

For Family Nurse Practitioner

Pha 645
Pharmacotherapeutics:
Application to
Advanced Practice
Nurs 771 Family Nurse
Practitioner:
Primary Care
Nurs 776 Family Nurse
Practitioner:
Small Group
Nurs 777 Family Nurse
Practitioner:
Practicum

**For Neonatal Nurse
Practitioner**

Nurs 630 Advanced
Assessment:
Neonate
Nurs 624 Neonatal
Pathophysiology
Nurs 772 Neonatal Nurse
Practitioner:
Practicum I
Nurs 779 Neonatal Nurse
Practitioner:
Practicum II
Pha 646 Neonatal
Pharmacotherapeutics

Nurs 640 Legal & Ethical Accountability in Health Care2
Study of the ethical positions and legal factors influencing behavior and decision making in health care. Emphasis on developing a justifiable ethical framework with consequent rights, responsibilities and conflicts. P, graduate students in nursing and other health professionals with instructor's consent.

Nurs 645 Management of Acute and Chronic Pain3
Provides opportunity to identify and discuss management principles of acute and chronic pain with noninvasive and invasive measures. P, graduate nursing student, other graduate students with instructor's consent.

Nurs 655 Health and the Older Adult2
Based on a multidisciplinary perspective, issues and topics affecting the health care of the older adult will be analyzed. P, senior or graduate nursing student, graduate or senior student of other health disciplines, or consent of the instructor. Required for Gerontology Emphasis.

Nurs 670 Health Policy, Legislation, Economics and Ethics3
Legislative, legal, ethical, economic, and political issues related to health policy that impact advanced nursing practice will be studied. Current and projected health care issues will be featured. Following an analysis of political viewpoints, change agent and leadership strategies designed to impact current state and national legislation will be applied. The effect of national economics on health care delivery systems will be addressed. Utilization of professional associations to impact health policy and legislation will be included. Economic justification of the Advanced Practice Nursing Role will be emphasized with attention to collaboration, resource procurement, and conflict resolution. Philosophical principles of biomedical ethics and decision-making will be integrated into all topical discussion. P, Nurs 610.

Nurs 690 Seminar: Guided Study in Nursing1-4
Investigation of a selected problem in nursing theory or practice. May be repeated for two semesters for variable credit.

Nurs 692 Special Problems1-3 (theory or lab or combination of these)
Directed study, analysis and/or research of selected problems related to clinical practice in nursing. May be a combination of discussion/conference and clinical experience. Open to qualified nursing graduate students by consent. Limit of 4 credits of special problems Nurs 692/792 can be applied to a degree.

Nurs 695 Special Topics1-3
Review and discussion of special concerns, issues or trends in the nursing profession, such as, but not limited to, legislation, ethics, administration, education. Topics will be of a non-clinical nature. Open to qualified nursing graduate students by consent. Limit of 3 credits can be applied to a degree.

Nurs 710 Curriculum Development in Nursing2
Principles of curriculum development and their application to nursing curricula. Selection, organization and evaluation of learning experiences. P, or concurrent, Nurs 610, or consent of instructor.

Nurs 725 Patient Care Management3
Identification and analysis of management theories influencing middle management nursing roles in a variety of patient care situations. P, or concurrent, Nurs 610, or consent of instructor.

Nurs 760 Health and Communication in Advanced Practice Nursing4
Advanced nursing concepts centered on health promotion and therapeutic communication applied to individuals, families, and groups in community-based environments of care will be the focus of this course. Impact of national, state, and local community resources and directives for health policy, disease prevention, and health maintenance among individuals, families and community groups will be addressed. Students will implement and evaluate a variety of strategies to promote the health of individuals, families, and community groups. Advanced family assessments and health appraisals will be central to the clinical experiences with an emphasis on the development of individual counseling techniques and skills and family process interpretation. P or concurrent, Nurs 610.

Nurs 760A Health and Communication in Advanced Practice Nursing Clinical Lab0

Nurs 765 Interventions for Complex Problems in Advanced Practice Nursing.....3
The effect of complex acute and chronic health problems on patients is examined in light of systematic assessment and literature. Interventions based on differential diagnosis are designed, modified, implemented, and evaluated to foster successful patient outcomes. P or concurrent, Nurs 610.

Nurs 765A Interventions for Complex Problems in Advanced Practice Nursing Clinical Lab.....0

Nurs 770 Clinical Nurse Specialist Practicum6
Extension and refinement of advanced nursing practice core competencies and the development of expertise in a clinical specialist role are the foci of this course. Researcher, consultant, leadership, educator, and clinical subrole functions will be used to influence the health care environment and advance the nursing profession. Student goals specific to selected specialty area(s) will be the basis for clinical experiences. Students will plan, implement, and evaluate theoretically and research-based interventions to directly and indirectly manage the health of clients and systems in selected specific specialty area(s) through the actualization of synthesized role components. P, completion of core requirements.

Nurs 770A Clinical Nursing Specialization-Practicum Clinical Lab	0
Nurs 771 Family Nurse Practitioner: Primary Care	6
This is the first of three courses designed for the family nurse practitioner. The emphasis of the course is on the application of knowledge to clinical practice in primary care settings. Students will strengthen their health history and physical examination skills in the formulation of differential diagnoses and clinical decision-making relative to acute conditions and developmental variations such as pregnancy. This course provides the basis for integrating clinical data with knowledge of pathophysiology to formulate diagnostic hypotheses for clients across the lifespan. The clinical practicum provides opportunities to develop competency in incorporating health promotion and illness management strategies into practice under the guidance of clinical faculty and preceptors.	
Nurs 771A Family Nurse Practitioner: Primary Care Clinical Lab.....	0
Nurs 772 Neonatal Nurse Practitioner: Practicum I.....	6
Integration of principles of prevention, epidemiology, pharmacology, physiology, and pathophysiology in a supervised practicum with neonates and their families. Emphasis placed on the role of clinician with attention to consultant, collaborator, educator, research utilizer, and advocate roles. Procedural, diagnostic reasoning, patient management, and organizational skill development stressed. P, completion of core requirements.	
Nurs 772A Neonatal Nurse Practitioner: Practicum I Clinical Lab.....	0
Nurs 774 Nurse Administrator: Practicum.....	6
Nurs 774A Nurse Administrator: Practicum Clinical Lab.....	0
Nurs 776 Family Nurse Practitioner: Small Group.....	3
This is the second of three primary care courses designed for the family nurse practitioner. Emphasis is placed on the integration of pathophysiology and specific disease and symptom complexes in the formulation of differential diagnoses and clinical management of chronic and/or complex health problems. Collaboration, consultation, and referral to multidisciplinary healthcare team members are emphasized in the development of appropriate interventions for the achievement and maintenance of optimal health. The context of the client's personal and cultural environment are incorporated. P, N771 or concurrent with N777 with consent of instructor.	
Nurs 777 Family Nurse Practitioner: Practicum.....	1-9
This is the third of three courses designed for the family nurse practitioner. This course is taken concurrently with Nurs 776. The clinical practicum offers the advanced practice nursing student the opportunity to synthesize and apply theoretical concepts derived from nursing and other health-related disciplines to the clinical practice setting for the provision of primary care to clients across the lifespan. Independent and interdependent clinical decision-making is expected and interdisciplinary collaboration and referral are emphasized. Clients are viewed in a personal, cultural, and environmental context. Advanced practice nursing issues are addressed in weekly seminars. P or concurrent with N776 with consent of instructor.	
Nurs 778 Nurse Educator: Practicum	6
Extension and refinement of advanced nursing practice core competencies within the development of the nurse education role are the foci of this course. Students will implement and evaluate a variety of educational theories and principles.	
Nurs 778A Nurse Educator: Practicum Clinical Lab	0
Nurs 779 Neonatal Nurse Practitioner: Practicum II.....	12
Integrates and synthesizes knowledge from foundation and core courses in a longitudinal clinical experience in the neonatal population. Supervised practice will include following a diverse caseload of infants and families providing daily assessment, diagnosis, and medical management from admission through discharge. Additional experiences include parent education, discharge planning, and post-discharge follow-up. P, Nurs 772.	
Nurs 779A Neonatal Nurse Practitioner: Practicum II Clinical Lab.....	0
Nurs 780 Seminar in Advanced Nursing	1-3
Discussion and reports of current literature, practices, or research in nursing. P, consent. Limit of 3 credits applied to Master's degree.	
Nurs 785 Self Care of the Older Adult	3
Analysis from a nursing perspective of various factors which alter the self-care of the older adult. A guided study approach to a conventional course. P, consent of instructor.	
Nurs 790 Thesis in Nursing	1-7
P, Nurs 626.	
Nurs 791 Thesis Sustaining, M.S.	0
Nurs 792 Problems in Nursing Research	1-2
Application of the nursing research process with particular emphasis on problems of inquiry in the health care system (Project or non-thesis option). P, Nurs 610. Nurs 626, regular admission status. Requires five additional credits of electives.	
Nurs 795 Problems in Nursing Research Sustaining	0

Electives

<i>Nurs 625 Human Sexuality in Health Care</i>
<i>Nurs 635 Dying, Death & Bereavement</i>
<i>Nurs 640 Legal and Ethical Accountability in Health Care</i>
<i>Nurs 645 Management of Acute and Chronic Pain</i>
<i>Nurs 655 Health and the Older Adult</i>
<i>Nurs 692 Special Problems</i>
<i>Nurs 695 Special Topics</i>
<i>Nurs 710 Curriculum Development in Nursing</i>
<i>Nurs 725 Patient Care Management</i>
<i>Nurs 780 Seminar in Advanced Nursing</i>
<i>Nurs 785 Self Care of the Older Adult</i>

Nutrition, Food Science and Hospitality

Degrees Offered:

- M.S. Family and Consumer Sciences
 - Nutrition and Food Science Option
- M.S. Biological Sciences
 - Nutrition and Food Science Option

Graduate Faculty

Helen Chipman
Associate Professor
Ph.D., Colorado State
University, 1992
Food Science and Human
Nutrition

Michael G. Crews
Professor
Ph.D., Virginia Polytechnical
Institute and State University,
1978
Nutrition

Kendra K. Kattelmann
Assistant Professor
Ph.D., University of Missouri,
1993
Nutrition

Padmanaban G. Krishnan
Associate Professor
Ph.D., North Dakota State
University, 1989
Food Science

Bonny L. Specker
Professor
Ph.D., University of Cincinnati,
1983
Epidemiology

Marilyn A. Swanson
Professor
Ph.D., Washington State
University, 1987
Nutrition

Chunyang Wang
Associate Professor
Ph.D., Iowa State University,
1993
Food Science

Department Head: Professor Marilyn A. Swanson
Graduate Coordinator: Professor Marilyn A. Swanson

For additional information contact:

Mailing address: SDSU Box 2275A
Nursing/Family/A&S — NFA
WWW: <http://www.abs.sdstate.edu/fcs/nfs/index.htm>
E-mail: Marilyn_Swanson@sdstate.edu

Phone: 605/688-5161
Fax: 605/688-5603

Program Description

Courses offered in Nutrition and Food Science support the Master of Science in Family and Consumer Sciences degree program. Students may select courses in Nutrition and Food Science as their area of study.

Additional Admission Requirements

GRE: Not required
TOEFL: Department Requirements of 525

Refer to College of Family and Consumer Sciences section, pages 84-85, for specific details.

General Requirements begin on page 13 (Master's Degree).

Graduate students should consult with their advisor before registering for graduate work.

Nutrition, Food Science and Hospitality (NFSH) Course Offerings

- NFSH 550 Food Analysis**4 S (even years)
Principles and techniques of physical and chemical analysis of food products. It will include proximate analysis of moisture, protein, lipids and carbohydrates and chemical or instrumental analysis of vitamins, minerals and food additives. P, NFSH 360, Chem 120 or consent.
- NFSH 550A Food Analysis Lab**.....0 S (even years)
- NFSH 551 Advanced Food Processing**.....4 F (even years)
This course is designed as a capstone course for undergraduate Food Science students and an introductory course for graduate students in food-related majors. The principles and technologies of food storage, process and packaging will be discussed in depth. Emphasis will be placed in the development of new food products. P, NFSH 151, NFSH 360, or consent.
- NFSH 551A Advanced Food Processing Lab**.....0
- NFSH 590 Seminar in Food and Nutrition**1 F
This seminar is designed to explore in depth topics related to the role of nutrition in health promotion and disease prevention in the community.
- NFSH 592 Special Problems**1-3
Special study in food and nutrition. P, consent.
- NFSH 593 Current Topics**1-3
Special course offerings on a topical basis stressing current state of knowledge on various topics. May be repeated for credit.

NFSH 634 Techniques in Food and Nutrition Research	3 F (even years)
Laboratory experience using methods, measurements and instruments for obtaining nutritional data. Topics covered will include methods of conducting field, applied and metabolic studies in food and human nutrition. P, Chem 361 or consent.	
NFSH 634A Techniques in Food and Nutrition Research Lab	0 F (even years)
NFSH 660 Maternal and Child Nutrition	3 FSSu (every third term)
Fundamental principles of nutrition during pregnancy, lactation, infancy and childhood. Topics include: the physiologic and genetic events that occur during the process of conception, pregnancy, and growth; nutritionally critical periods during pregnancy, lactation and growth; implications of nutrition on health, growth and mental/emotional development; development of food habits in children; and the current educational and support programs available to the mother and child.	
NFSH 662 Sociocultural Aspects of Nutrition	2 Su (even years)
The study of diverse dietary patterns and their impact on nutritional health including food attitudes, socioeconomic structures, cultural patterns of food intake and their effect on nutrient composition of the diet. P, NFS 221 or NFS 321 or consent.	
NFSH 704 Phytochemicals	2 F
The course is an overview of phytochemicals (non-nutritive biologically active compounds) from fruits, vegetables, cereals and oilseeds. It will cover recent findings on chemistry, physiological functions, potential health implications of phytochemicals. It has been developed as an Internet-based course.	
NFSH 725 Nutrition and Human Performance	3 S (even years)
This course is designed to develop an understanding of nutrition, based upon knowledge of the biochemical and physiological process and functions of specific nutrients in meeting nutritional requirements. Emphasis will be placed upon the relationship of optimal nutrition and physical efficiency and performance.	
NFSH 760 Vitamins and Minerals in Human Nutrition	3 FSSu (every 3rd semester)
The study of the functional roles of vitamins and minerals in human nutrition. Course content will include: identification of essential functions for the vitamins and minerals; health implications of varying amounts of vitamins and minerals in the diet; interactions between vitamins; interactions between minerals; vitamin and mineral interactions; and the process of establishing nutrient requirements.	
NFSH 761 Nutrition of the Aged	3 S (odd years)
Physiological and behavioral changes associated with aging and their impact on nutrition. Effect of nutrition on aging and lifespan. Common health problems of the aged and their implications. P, NFS 321 or consent.	
NFSH 792 Special Problems	1-3
Special studies in Nutrition and Food Science. Consent.	
NFSH 793 Current Topics	1-3
Special course offerings on current issues in the fields of Nutrition and Food Science. Consent.	

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
Su = Summer
(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Pharmaceutical Sciences

Degree Offered:

M.S. Biological Sciences

• Pharmaceutical Sciences emphasis

Graduate Faculty

Joye Billow
Professor
Ph.D., Temple University, 1972
Communications

Bruce L. Currie
Professor
Ph.D., University of Utah, 1970
Medicinal Chemistry

Chandradhar Dwivedi
Professor
Ph.D., Lucknow University,
1972
Pharmacology

Xiangming Guan
Associate Professor
Ph.D., University of Kansas,
1991
Medicinal Chemistry

Joel Houglum
Professor
Ph.D., University of Wisconsin-
Madison, 1979
Analytical Methods

Danny L. Lattin
Professor
Ph.D., University of Minnesota,
1970
Medicinal Chemistry

Suman Mukherjee
Assistant Professor
Ph.D., University of Southern
California, 1997
Pharmaceutics

Yadhu Singh
Professor
Ph.D., University of
Strathclyde, 1979
Pharmacology

Department Head: Professor Bruce L. Currie
Graduate Coordinator: Professor Chandradhar Dwivedi

For additional information contact:

Mailing address: SDSU Box 2202C

Pharmacy — PHA

WWW: <http://www.sdstate.edu/wpha/http/college.html>

E-mail: Pharm_Sci@sdstate.edu

Phone: 605/688-5598

Fax: 605/688-5993

Program Description

The Department of Pharmaceutical Sciences offers courses and research opportunities in medicinal chemistry, pharmaceutics and pharmacology to fulfill the requirements for the Master of Sciences in Biological Sciences degree. Graduates are well prepared to work in the pharmaceutical industry, government and research laboratories, or continue their studies in a doctoral program.

Available Options for Graduate Degrees

Master of Science: Option A

See page 15 for description of Option A

Core Requirements

1. PHA 720 Advanced Medicinal Chemistry, PHA 740 Advanced Pharmacology, PHA 759 Advanced Pharmaceutics
2. BioS 792 Seminar, two credits
3. BioS 790 Thesis, 5-7 credits
4. Six credits must be taken from the following list of courses:
 - ABS 705Research Methodology
 - ABS 706Natural Resources Management
 - ABE 503Energy and Environment
 - ABE 554Advanced Unit Operations in Food/Biomaterials Processing
 - Chem 662Principles of Biochemistry
 - DS 722Advanced Dairy Microbiology
 - HO 580Environmental Stress Physiology
 - NFSH 725Nutrition and Human Performance
 - STAT 541Statistical Methods II
 - VET 524Medical and Veterinary Virology
5. 6-8 credits of discipline specific courses

Additional Admission Requirements

GRE: General GRE required of all applicants
TOEFL: Graduate School requirement of 525

Pharmacy (Pha) Course Offerings

- Pha 720 Advanced Medicinal Chemistry3**
Qualitative and quantitative aspects of the design of therapeutic agents. P, Pha 341 or consent.
- Pha 725 Topics in Medicinal Chemistry3**
Selected areas covering more advanced concepts in medicinal chemistry, new research techniques. P, Pha 341 or consent.
- Pha 740 Advanced Pharmacology3**
An advanced and comprehensive study of the therapeutic and toxicological effects of drugs including the mechanism of action. Emphasis will be placed on their rational application to the treatment of disease. P, Pha 443 or consent.
- Pha 745 Topics in Pharmacology 3**
A study of current advanced theories in pharmacology. P, Pha 443 or consent.
- Pha 759 Advanced Pharmaceutics 3**
Theory and application of compartmental models for the study of the time course of drugs in the body. P, Pha 415 or consent.
- Pha 765 Topics in Pharmaceutics..... 3**
Selected areas covering more advanced concepts in pharmaceutics, new research techniques. P, Pha 415 or consent.
- Pha 780 Seminar..... 1**
Contemporary topics in the pharmaceutical sciences. Required of all graduate students in pharmaceutical sciences. Maximum of two credits.
- Pha 790 Thesis in Pharmaceutical Sciences 1-7**

Master of Science in Pharmaceutical Sciences Inactive Status



Pharmacy

Degree Offered:
Doctor of Pharmacy

Graduate Faculty

James Clem
Associate Professor
Pharm.D., University of Iowa,
1991
Cardiology

Debra K. Farver
Professor
Pharm.D., University of
Nebraska, 1983
Psychiatry

Dennis Hedge
Associate Professor
Pharm.D., University of
Kansas, 1991
Infectious Disease

Jodi Heins
Associate Professor
Pharm.D., University of
Nebraska, 1993
Internal Medicine

Tom Johnson
Assistant Professor
Pharm.D., North Dakota State
University, 1997
Critical Care

Brian Kaatz
Professor
Pharm.D., University of
Minnesota, 1977
Clinical Pharmacy

Jennifer Menke
Associate Professor
Pharm.D., Purdue University,
1992
Ambulatory Care

Kimberly Messerschmidt
Associate Professor
Pharm.D., South Dakota State
University, 1995
Internal Medicine

Jane Mort
Professor
Pharm.D., University of
Nebraska-Medical Center,
1985
Geriatrics

Dean: Professor Danny L. Lattin

Pharmaceutical Sciences Department Head: Professor Bruce L. Currie

Clinical Pharmacy Department Head: Professor Brian Kaatz

For additional information contact:

Mailing address: SDSU Box 2202C

Pharmacy — PHA

WWW: <http://www.sdstate.edu/wpha/http/college.html>

E-mail: College_Pharmacy@sdstate.edu

Phone: 605/688-6197

Fax: 605/688-6232

Doctor of Pharmacy

Six-Year Program: The Professional Degree in Pharmacy. Students interested in this program should consult the undergraduate catalog for information.

Master of Science in Biological Sciences

See Department of Pharmaceutical Sciences

Pharmacy (Pha) Course Offerings

Pha 645 Pharmacotherapeutics: Application to Advanced Practice4 Su
Current drug therapy principles with emphasis on drugs and pharmacotherapeutics used in Family Nurse Practitioner practice. P, FNP program enrollment.

Pha 646 Neonatal Pharmacotherapeutics2 Su
Principles of pharmacology will be presented in relation to unique neonatal physiologic and behavioral responses. Emphasis will be placed on drug administration, reasoned prescribing practices, and therapeutic drug monitoring. Drug categories and specific preparations which are commonly used in the neonate will be reviewed in tandem with disease specific content.

**Pharmacy (Pha) Graduate Courses
offered and applied to the Doctor of Pharmacy program**

700 Directed Studies Clerkship.....	4	732 Therapeutics-Renal/Fluid and Electrolytes.....	3
701 Home Health Care/Hospice Clerkship.....	4	733 Therapeutics-Gastrointestinal and Nutrition.....	3
702 Indian Health Service Clerkship.....	4	734 Therapeutics-Endocrine/ Reproduction.....	2
703 Pharmacy Administration Clerkship.....	4	735 Therapeutics-Infectious Disease.....	3
704 Nutrition Clerkship.....	4	736 Therapeutics-Neurology/Psychiatry.....	3
705 Clinical Research Clerkship.....	4	737 Therapeutics-Cardiopulmonary.....	4
706 Critical Care Clerkship.....	4	738 Therapeutics-Hematology/ Oncology.....	2
707 Infectious Disease Clerkship.....	4	739 Therapeutics-Rheumatology/ Skin/Skeletal.....	2
708 Surgery Clerkship.....	4	743 Pharmacy Care in the Community.....	2
709 Nephrology Clerkship.....	4	750 Critical Care Therapeutics.....	2
710 Pharmacokinetics Clerkship.....	4	751 Immunotherapeutics.....	2
711 Oncology Clerkship.....	4	752 Drugs of Abuse.....	2
712 Nuclear Pharmacy Clerkship.....	4	753 Women and Children's Health.....	2
713 Managed Care Clerkship.....	4	754 Alternative Medicines.....	2
714 Community Pharmacy.....	6	755 Research Design and Drug Information.....	4
716 Institutional Pharmacy.....	6	755A Research Design and Drug Information Lab.....	0
717 Community Pharmaceutical Care Clerkship.....	4	760 Clinical Pharmacokinetics.....	3
718 Advanced Clinical Lab Monitoring.....	3	770 Pediatrics Clerkship.....	4
718A Advanced Clinical Monitoring Lab.....	0	771 Geriatrics Clerkship.....	4
719 Physical Assessment Lab.....	1	772 Internal Medicine I Clerkship.....	4
722 Therapeutics: The Geriatric Patient.....	2	773 Internal Medicine II Clerkship.....	4
723 Ethics in Healthcare Practice.....	2	774 Ambulatory Care Clerkship.....	4
724 Pharmacoeconomics.....	2	775 Psychiatry Clerkship.....	4
727 U.S. Health Care Systems.....	2	784 Seminar I.....	1
728 Current Issues in Pharmacy Practice.....	3	785 Seminar II.....	1
729 Pharmaceutical Marketing.....	2	791 Directed Studies.....	1-3
730 AdvancedPharmacotherapeutics I.....	6	793 Special Topics in Pharmacy.....	1-3
730A Advanced Pharmacotherapeutics Lab I.....	0		
731 Advanced Pharmacotherapeutics II.....	6		
731A Advanced Pharmacotherapeutics II Lab.....	0		

Philosophy & Religion

Coursework only offered

Graduate Faculty

AnnMarie B. Bahr
Professor of Philosophy and
Religion
Ph.D., Temple University, 1989
World Religions

Dennis D. Bielfeldt
Associate Professor of
Philosophy and Religion
Ph.D., University of Iowa, 1987
Luther and Christian Theology

Matthew Glass
Associate Professor
Ph.D., Graduate Theological
Union, 1989
Religion in American Culture,
Environmental Ethics,
Sociology of Religion

Department Head: Distinguished Professor Robert V. Burns

For additional information contact:

Mailing address: SDSU Box 504
Scobey Hall — SCO
E-mail: sdsu_psycmain@sdstate.edu

Phone: 605/688-4322
Fax: 605/688-6754

Philosophy (Phil) Course Offerings

Phil 592 Special Problems in Philosophy 1-3
Individual guided research culminating in formal research paper or series of essays. May be repeated until 6 credits are earned.

Religion (Rel) Course Offerings

Rel 592 Special Problems in Religion..... 1-3 FSSu
Individual guided research culminating in formal research paper or series of essays. May be repeated until 6 credits are earned.

Physics

Degree Offered:

M.S. Engineering

- Physics coursework concentration

Department Head: Professor Oren Quist

Graduate Coordinator: Professor Oren Quist

For additional information contact:

Mailing address: SDSU Box 2219

Crothers Engineering Hall — CEH

WWW: <http://www.engineering.sdstate.edu/~physics/physics.htm>

E-mail: Oren_Quist@sdstate.edu

Phone: 605/688-5428

Fax: 605/688-5878

Program Description

The Physics Department at South Dakota State University offers a program leading to the Master of Science in Engineering with an area of emphasis in Physics. Required course work in physics along with elective courses selected from the departments of Mathematics and Statistics, Computer Science, General Engineering, Electrical Engineering and Mechanical Engineering support a number of career options in industry, education and applied research. Graduates with this degree may also pursue a Ph.D. degree in physics or an engineering discipline. Areas of research concentration include astrophysics, gravitational physics, remote sensing, image processing, condensed matter, materials science, nuclear physics, and theoretical physics.

A Ph.D. in Environmental Engineering with a physics emphasis is available through the College of Engineering. This program has course work and plan of study designed through the physics department and likely could be an extension of the M.S. degree described above.

The Physics Department offers the physics content coursework for the *Masters of Education: Curriculum and Instruction; Physics Content Area*, degree. See PHST 601 (page 121) for more details. This curriculum, designed mainly for high school physics teachers, is offered during summer sessions.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

Refer to College of Engineering section, pages 78-80, for specific details.

Physics Core Requirements

There are nineteen credits of core requirements for this degree. These requirements consist of:

- six credits in Electricity and Magnetism;
- three credits in Statistical Mechanics;
- three credits in Theoretical Mechanics;
- six credits in Quantum Mechanics, *and*
- one credit of Seminar.

Please check with the Physics Department office for specific course offerings that meet these core requirements.

Graduate Faculty

John Kitterman
Associate Professor
Ph.D., Colorado State
University, 1970
Condensed Matter

O. W. Leisure
Professor
M.S., South Dakota State
University, 1966
Nuclear Physics

Oren Quist
Professor
Ph.D., University of Denver,
1973
Condensed Matter

Joel Rauber
Professor
Ph.D., University of North
Carolina-Chapel Hill, 1985
General Relativity,
Computational Physics

Stephen J. Schiller
Professor
Ph.D., University of Calgary,
1986
Astrophysics

Key to Course Descriptions

Course Number & Name

Credits

F = Fall

S = Spring

Su = Summer

(Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Physics (Phys) Course Offerings

Phys 533 Nuclear and Elementary Particle Physics	3
Radioactivity, nuclear spectra and structure, nuclear models, elementary particle theories and high energy physics. P, Phys 471 or consent.	
Phys 541 Science of Solids	3
Topics covered to satisfy student interests in areas such as magnetism, semi-conductors, superconductors, ferroelectrics, and devices based on these aspects of solids. The role of defects in solids and strength of materials may also be included. P, Phys 439 or consent.	
Phys 693 Special Topics	1-3
Phys 694 Special Problems	1-3 FSSu
Phys 700 Seminar	0-1
Current, state-of-the-art topics in engineering and physics. All graduate students are required to take this course each semester in residence and no more than twice for credit. Students registering for zero credit will be required to attend all sessions. Students who register for one credit will be required to write a paper and make a presentation on a subject related to their research or design paper.	
Phys 721 Electrodynamics I	3
Electrostatics and magnetostatics, including a study of boundary value problems and the multi-pole expansions, leading to the study of Maxwell's equations. The relationship between special relativity and electromagnetism will also be discussed. P, Phys 421.	
Phys 723 Electrodynamics II	3
The electrodynamics of time varying fields and radiating processes. This will include topics chosen from plane and spherical waves, wave guides, multipole radiation, radiation from moving charges, plasma physics and magneto-hydrodynamics. P, Phys 721.	
Phys 743 Statistical Mechanics	3
Derivations of Boltzmann distribution law, Bose Einstein statistics, Fermi-Dirac statistics, basic theory of gas and liquid states, order-disorder phenomena, the partition function. P, Phys 341.	
Phys 751 Theoretical Mechanics	3
Further development of Lagrangian and Hamiltonian methods, canonical transformations, rigid body motion, relativistic mechanics. P, Phys 351.	
Phys 771 Quantum Mechanics I	3
Basic quantum theory, the Schrodinger equation, matrix mechanics and operator methods as applied to the simple harmonic oscillator, hydrogen atom and other simple potentials. A study of angular momentum operators and the central force problem will be included. P, Phys 471.	
Phys 773 Quantum Mechanics II	3
A quantum mechanical treatment of scattering, spin, stationary and time dependent perturbation theory. Other advanced topics such as applications of group theory to quantum mechanics, identical particles and creation and annihilation operators as applied to many particle systems will be studied. P, Phys 771.	
Phys 775 Tensors & General Relativity	3
Covariance in physics, basic tensor algebra and calculus, affine connections, the Riemann tensor, field equations, linear approximations. The Schwarzschild solution. P, Phys 421 or consent.	
Phys 779 Group Theory in Quantum Mechanics	3
Symmetry transformations, continuous groups, finite groups, applications to valence theory, Lorentz group, fundamental particles. P, Phys 471.	
Phys 780 Theoretical Physics	3-18
This course is the hub course for the Masters of Science Degree in Engineering, Physics Emphasis. It is a course with credit value depending upon the number of theoretical physics areas in which a student enrolls, and can be repeated as many times as desired depending upon remaining theoretical physics areas. Physics 780 will meet weekly for one class hour, the hub session, and in addition, one class hour per week for each credit of theoretical physics topic area in which a student enrolls. The weekly hub sessions will be in a seminar format and will enable the discussion of theoretical physics concepts not included in the current specific areas of the course, as well as a forum for allowing the students to discuss and learn the interrelationship between the various theoretical areas. All students registered for one or more theoretical physics areas are required to participate in all of the hub sessions.	
A student will be required to complete all 18 credits of Physics 780 to receive the Master of Science in Engineering, Physics Emphasis degree. Additional coursework and/or requirements also need to be completed. Theoretical physics subject areas to be included under the Physics 780 hub include: Electrodynamics I (3cr), Electrodynamics II (3cr), Statistical Mechanics (3cr), Classical Mechanics (3 cr), Quantum Mechanics I (3cr), and Quantum Mechanics II (3cr).	

Phys 790 Thesis	5-7
Phys 791 Thesis Sustaining.....	0
Phys 792 Research or Design Paper	2
Phys 793 Special Topics.....	1-3
Phys 794 Special Problems.....	1-3
Phys 795 Research or Design Paper Sustaining.....	0
Phys 797 Research	1-9

Physics Teaching (PHST) Course Offerings

PHST 601 Physics Topics for Educators	1-9
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This course is the hub course for the *Masters of Education: Curriculum and Instruction; Physics Content Area*, degree. It is a course with credit value depending upon the number of physics topic areas in which a student enrolls, and can be repeated as many times as desired depending upon remaining physics topic areas. Topics include mechanics, thermodynamics, electricity and magnetism, optics, modern physics, and astronomy areas. PHST 601, the hub section, will meet regularly in a seminar format to enable the discussion of physics topics not included in the current specific areas of the course, as well as a forum for allowing the students to discuss and learn the interrelationships between the various topic areas. All students registered for one or more physics topic areas are required to participate in all of the hub sessions.

Plant Science

Degrees Offered:

Ph.D. Agronomy

Biological Sciences

- Plant Science area of study

M.S. Plant Science

- Agroecology emphasis
- Agronomy emphasis
- Crop Science emphasis
- Entomology emphasis
- Horticultural Crop Management
- Machinery Systems and Water Management
- Plant Pathology emphasis
- Soil Science emphasis
- Weed Science emphasis

Graduate Faculty

Arvid Boe

Professor

Ph.D., South Dakota State University, 1979

Breeding - Forages

C. Gregg Carlson

Professor

Ph.D., South Dakota State University, 1978

Soil Salinity/Irrigation

Catherine Carter

Associate Professor

Ph.D., University of Kentucky, 1982

Molecular Biology

Thomas Chase

Associate Professor

Ph.D., University of Vermont, 1986

Pathology - Row Crops

Fred Cholick

Professor

Ph.D., Colorado State University, 1977

Breeding - Spring Wheat

David Clay

Associate Professor

Ph.D., University of Minnesota-Minneapolis/St. Paul, 1988

Soil Biochemistry/Nutrient Movement

Sharon Clay

Professor

Ph.D., University of Minnesota-Minneapolis/St. Paul, 1986

Weed Research

Department Head: Professor Dale Gallenberg

Graduate Coordinator: Associate Professor Thomas Chase

For additional information contact:

Mailing address: SDSU Box 2108

Plant Science Building— PSB

WWW: <http://www.sdstate.edu/~wpls/http/pscihome.html>

E-mail: Thomas_Chase@sdstate.edu

Phone: 605/688-5156

Fax: 605/688-4024

Program Description

The Plant Science Department is an integrated department that includes crops, entomology, plant pathology, soils, water management and weed science. The primary goals of the department are to conduct research in the above areas, to transmit the results to the public, and to help prepare students for a quality life which includes preparation for an occupation in one or more of the above-mentioned disciplines.

Available Options for Graduate Degrees

- Master of Science:* Option A Plant Science
Option B Plant Science, non thesis
- Doctor of Philosophy:* 60-Credit Plan
90-Credit Plan

See pages 15 (M.S.) and 18 (Ph.D.) for descriptions of available options.

Core Requirements

M.S. students required to have 2 credits of Graduate Seminar, one oral and one in poster format. All students are required to have teaching experience.

Ph.D. students required to have 3 credits of Graduate Seminar, at least one oral and one in poster format. All students are required to have at least one teaching experience during their Ph.D. program.

Additional Admission Requirements

GRE: Required

TOEFL: University requirement of 525

Students must be accepted by an advisor before admission is granted.

General Requirements begin on page 13 (Master's Degree) and 18 (Ph.D.).

Graduate students should consult with their advisor before registering for graduate work.

Plant Science (PS) Course Offerings

- PS 512 Environmental Soil Chemistry3 S (odd years)**
 Fundamentals of soil chemical properties and processes important for the sound management of soil resources. Topics include sorption/desorption of inorganic and organic compounds, bioavailability of nutrients and contaminants, oxidation/reduction, phase equilibria, soil organic matter, soil mineralogy, ion exchange, and saline/sodic soils. P, Chem 120 or 111, PS 213, or consent from instructor.
- PS 515 Mycology2 F (odd years)**
 Comprehensive taxonomic survey of the Kingdom Fungi; reproductive biology, physiology, genetics, and ecology of fungal organisms; relationship of fungi to human affairs. Cross-listed with Bio 415-515.
- PS 515A Mycology Lab1**
- PS 520 Biological Control of Arthropods.....2 F (odd years)**
 Introduction to the principles of biological control of arthropod pest populations through the use of natural enemies, including parasites, parasitoids and predators. Topics will include the history, theory, and practice of biological control, and relevant aspects of the genetics, ecology and behavior of natural enemies. P, 305 or equivalent, or consent of instructor.
- PS 520A Biological Control of Arthropods Lab.....1**
- PS 521 Soil Microbiology3 S (even years)**
 Microbial species of agricultural soils, environmental factors affecting their numbers and activity, and biochemical changes brought about by these microorganisms. P, Micr 231, or consent. Cross-listed with Micr 421/521.
- PS 521A Soil Microbiology Lab0**
 Cross-listed with Micr 421A/521A.
- PS 531 Applied Insect Ecology2 S (odd years)**
 An introduction to the principles of insect ecology and their application to pest management tactics. Ecological factors that affect pest and beneficial insects in agricultural environments will be examined. Topics include trophic relationship, population dynamics, sampling and life-table analysis, environmental heterogeneity and dispersal. P, 305 or equivalent, or consent of instructor.
- PS 531A Applied Insect Ecology Lab1**
- PS 546 Agroecology 3 F (odd years)**
 Agroecology uses the science of ecology to study agricultural systems and solve agricultural problems using comparisons between altered and unaltered ecosystems. Including: nutrient cycling, energy flow, hydrology, climatology, species diversity, and population dynamics. Field trips required. P, 213 and Bio 101 or consent.
- PS 550 Field Studies in Plant Disease Diagnosis1 Su (alternate years)**
 Diagnoses of diseases in field and horticultural crops; observing and studying the relationships among hosts, pathogens, and their environments. Emphasis on field disease recognition and laboratory diagnostic techniques. P, consent.
- PS 550A Field Studies in Plant Disease Diagnosis Lab1**
- PS 553 Advanced Genetics3 F (even years)**
 Procedures in genetic studies as they relate to molecular and classical genetic applications. P, Bio 371. Cross-listed with Bio 453-553.
- PS 562 Molecular Biology I2 F**
 Charge, partitioning migration of molecules; protein structure, enzymes; DNA structure and properties, prokaryotic and eukaryotic conjugation, transduction and transformation; DNA replication and repair; genetic recombination; RNA structure and properties; RNA replication and repair; mRNA synthesis and processing; kinetics; chromosomes and chromosome replication. P, Micr 436, Chem 361, or consent. Cross-listed with Bio 462/562.
- PS 564 Molecular Biology II2 S**
 Structure of the nucleus; endocytosis; genome of mitochondria and chloroplasts; cell growth and division; cancer; immune system; pattern formation; homeoboxes; intracellular transport; gene expression and regulation. P, Bio 462/562 or consent of instructor. Cross-listed with Bio 464-564.
- PS 565 Molecular Biology II Laboratory2 S**
 Screening recombinant DNA libraries; DNA sequencing; analysis of proteins; detection of proteins; RNA transfer and hybridization analyses; use of nucleic acid and protein databases. P, 462-562, 463-563. Cross-listed with Bio 465-565.
- PS 580 Environmental Stress Physiology.....3 S (even years)**
 Physiology and cellular response of plants to environmental stresses. P, Bot 327. Cross-listed with Bio 480/580 and HO 480/580.

James Doolittle
 Associate Professor
 Ph.D., Texas A & M University,
 1991
 Soil Chemistry

Billy Fuller
 Associate Professor
 Ph.D., Louisiana State
 University, 1987
 Entomology - Field Crops

Dale Gallenberg
 Professor
 Ph.D., Cornell University, 1984
 Pathology - Extension

Ron Gelderman
 Professor
 Ph.D., North Dakota State
 University, 1987
 Soil /Plant Analysis

Yue Jin
 Associate Professor
 Ph.D., North Dakota State
 University, 1990
 Pathology - Small Grains

Paul Johnson
 Associate Professor
 Ph.D., University of Wisconsin-
 Madison, 1992
 Entomology - Systematics

Kevin Kephart
 Professor
 Ph.D., Iowa State University of
 Science and Technology, 1986
 Forage Physiology

Robert Kohl
 Professor
 Ph.D., Utah State University,
 1962
 Soil Irrigation and Physics

Marie Langham
 Associate Professor
 Ph.D., Texas A&M University,
 1986
 Plant Pathology - Viruses

Douglas Malo
 Distinguished Professor
 Ph.D., North Dakota State
 University, 1975
 Soil Genesis/Classification

Dale Reeves
 Professor
 Ph.D., Colorado State
 University, 1969
 Breeding - Oats

Diane Rickerl
 Professor
 Ph.D., Auburn University,
 1986
 Agroecology

Jackie Rudd
 Associate Professor
 Ph.D., Kansas State University,
 1992
 Breeding - Spring Wheat

Tom Schumacher
 Professor
 Ph.D., Michigan State
 University, 1982
 Soil Physics and Conservation

Roy Scott
 Associate Professor
 Ph.D., Kansas State University
 of Agriculture and Applied
 Science, 1987
 Breeding - Soybeans

James Smolik
 Professor
 Ph.D., South Dakota State
 University, 1973
 Plant Pathology - Nematodes

Fedora Sutton
 Associate Professor
 Ph.D., Howard University,
 1985
 Molecular Biology

Zeno Wicks, III
 Professor
 Ph.D., North Dakota State
 University, 1979
 Breeding - Corn

Howard Woodard
 Associate Professor
 Ph.D., Rutgers University, 1985
 Soil Fertility

**Adjunct/Courtesy/Joint
 Faculty**

Michael Ellsbury
 Associate Professor
 Ph.D., University of Arizona,
 1979
 Research Entomology

Donald Evenson
 Distinguished Professor of
 Chemistry and Biochemistry
 Ph.D., University of Colorado,
 1968
 Cellular Biochemistry

PS 593 Special Topics1-6 (1-3 per credit) FSSu
 Concentrated study, work, or discussion of a particular field in the plant science disciplines. Subject areas vary from semester to semester. Based on interest of students and professionals needing additional study and investigation of topics for which there is a current need but which are not part of a regular class. Offered on sufficient demand. P, consent of instructor.

PS 700 Special Topics 1-6 (1-3 per credit) FSSu
 Advanced study of one or more selected topics. P, consent.

Advanced Plant Breeding	Saline and Sodic Soils	Soil-Plant Modeling
Entomology	Soil Chemistry	Teaching Experience
Mycology	Soil Genesis	Virology
Phytobacteriology	Soil Mineralogy	Weed Science
Quantitative Genetics	Soil Physics	

PS 704 Virus & Bacterial Diseases of Plants2 F (even years)
 Plant diseases caused by viroids, viruses, bacteria and mycoplasma-like organisms including identification, development, symptoms, and control. Advanced laboratory research methods used in isolation, transmission, culture, purification, microscopy, serology and investigation of the nature and properties of important plant pathogens. P, consent. Alternate years.

PS 704A Virus & Bacterial Diseases of Plants Lab2

PS 714 Genetics of Disease Resistance and Host-Plant Pathogen Interaction....3 (alternate years)
 Physiology, genetics, and molecular biology of host-plant pathogen interactions and disease resistance; pathogenic diversity and virulence dynamics of plant pathogens; crop vulnerability and plant disease epidemiology; and breeding plants for disease resistance. P, consent.

PS 714A Genetics of Disease Resistance and Host-Plant Pathogen Interaction Lab1

PS 720 Insect Anatomy and Physiology2 S (odd years)
 Introduction to the internal anatomy of insects, and the principles of the physiology of insect cells, tissues, organs and systems. P, PS305, or equivalent or consent of instructor.

PS 720A Insect Anatomy and Physiology Lab 1

PS 721 Integrated Crop Pest Management.....3 S (odd years)
 The biological and ecological basis of integrated pest management for midwestern crop insects and the understanding of economic thresholds are emphasized. Pest scouting techniques for major crop pests and simulated management decisions are discussed.

PS 722 Behavioral Management of Insects2 F (even years)
 Principals of insect behavior stressing the role of behavior in designing management tactics. Topics include direct exploitation of behavior for control, sub-lethal behavioral effects of pesticides, and the use of semiochemicals for population monitoring and mating disruption. Methods for sampling, measuring and evaluating insect behaviors will be examined. P, PS305, or equivalent or consent of instructor.

PS 722A Behavioral Management of Insects Lab1

PS 732 Field Studies in Pedology2 Su (even years)
 Field techniques used in soil classification will be learned by studying soils during a week-long field exercise. Soil genesis and land use applications will be investigated. The impact of soils upon agronomic management and research will be presented. The class may be repeated for a maximum of 4 credits. P, PS/Geog 310 or PS 733 or consent of instructor.

PS 733 Advanced Soil Genesis3 S (even years)
 Detailed study of the processes of soil genesis and an examination of soil and ecosystems with respect to the soil forming factors of time, parent material, topography, climate and organisms. P, consent.

PS 741 Crop Breeding Techniques1 Su (even years)
 A techniques course where artificial hybridization of crop plants will be demonstrated and carried out. Background material will be offered with each crop. Both field and horticultural crops are included.

PS 743 Physical Properties of Soils3 F (even years)
 The exchange of energy and water at soil surfaces, infiltration and redistribution of water and soil physical properties related to plant growth. Emphasis on applications in development and utilization of soil and water resources in a manner consistent with preservation of environmental quality. P, consent.

PS 744 Soil N, P, & K3 S (odd years)
 Plant-soil nutrient relationships including nutrient sink development, uptake, transport to roots, labile soil sources, nutrient deficiencies, and their correction. Emphasis on nitrogen, phosphorus and potassium. P, consent.

PS 745 Soil/Plant Secondary Macronutrients and Micronutrients	2 S (even years)
Forms and reactions of secondary and micronutrients in soils, their plant functions and requirements, as well as deficiency correction. P, consent.	
PS 746 Plant Breeding	3 S
Plant Breeding applied to field crops and horticultural varieties with particular emphasis on the relationship of genetics and allied subjects. Cross-listed with HO 746. P, PS 103, Bio 371, or consent.	
PS 754 Chemical Properties of Soils	3 F (odd years)
Chemical considerations of the dynamic interactions of soil-water-gas phases as affected by climate, soil age, kinds of minerals or organic matter, added fertilizer elements, and plants. P, consent of instructor.	
PS 756 Quantitative Genetics	3 S (even years)
Theory and application of quantitative genetic analysis to applied breeding problems; estimation and partitioning of genetic variances; genetic covariance and regression; heritability and selection response; index selection; linkage and quantitative trait loci (QTL) analysis. P, Bio 371 and Stat 641, or equivalent, or consent.	
PS 761 Taxonomy of Insects	3 F (odd years)
Collection, identification and classification of insects. Techniques of identifying the groups of economic insect pests that affect the production of feed, food and fiber.	
PS 761A Taxonomy of Insects Lab	1
PS 763 Environmental & Physiological Aspects of Crop Production	2 S (odd years)
Systems analysis of factors which limit or increase crop production and the potential for qualitative and quantitative adjustments. P, Bot 427 and consent of instructor.	
PS 773 Cytogenetics	2 F (odd years)
To study the nature and behavior of chromosomes in relation to heredity. P, Bio 343 or Bio 371. Cross-listed with Bio 773.	
PS 773A Cytogenetics Lab	1
PS 780 Advanced Special/Research Problems	1-2 FSSu
Advanced study and research in crops, plant pathology, and soils. P, consent.	
PS 781 Plant Science Graduate Seminar	1 FS
Reports and discussions of current investigations in crops, entomology, plant pathology, and soils. (2 credits required for M.S.; 3 credits for Ph.D.)	
PS 783 Crop-Water Relationships	2 F (odd years)
An examination of the role of water on crop productivity with an emphasis on environmental and physiological factors affecting the absorption, movement and use of water in crops. Water associated stresses will be analyzed in terms of agronomic and physiological mechanisms of adaptation. P, Bot 427 and consent.	
PS 790 Thesis, M.S.	1-7 FSSu
PS 791 Thesis Sustaining	0 FSSu
PS 797 Soil and Plant Analysis	2 F (odd years)
The analysis of soil and plant material for constituent elements. Topics covered include: Material sampling and preparation, extraction and determination method, theoretical principles of analysis, accuracy and precision. Emphasis on common soil and plant test indices. P, consent.	
PS 797A Soil and Plant Analysis Lab	1
PS 798 Biometrical Genetics	3
PS 799 Advanced Plant Breeding	3
PS 890 Dissertation, Ph.D.	1-7 FSSu
Directed research for the Ph.D. in Agronomy. Course may be repeated for a maximum of 40 credits. A minimum of 20 credits is required for Ph.D. in Agronomy.	
PS 891 Dissertation Sustaining, Ph.D.	0 FSSu

Biological Sciences (BioS) Course Offerings

BioS 890 Dissertation—Ph.D.	1-7 FSSu
BioS 891 Dissertation Sustaining	0 FSSu
BioS 892 Ph.D. Seminar	1 FS

Leslie Hammack
Assistant Professor
Ph.D., University of Wisconsin-
Madison, 1974
Research Entomology

Alex Kahler
Professor
Ph.D., University of California,
1973
Molecular Biology

R. Neil Reese
Professor of Biology and
Microbiology
Ph.D., University of Idaho,
1984
Plant Physiology

Walter Riedell
Assistant Professor
Ph.D., Southern Illinois
University, 1984
Plant Physiology

Peter Schaefer
Professor of Horticulture,
Forestry, Landscape and
Parks
Ph.D., Michigan State
University, 1983
Forest Genetics

Political Science

Minor only offered

Graduate Faculty

Robert V. Burns
Distinguished Professor
Ph.D., University of Missouri-
Columbia, 1973
Public Law

Gordon Tolle
Professor
Ph.D., University of Colorado-
Boulder, 1978
Political Philosophy

Department Head: Distinguished Professor Robert V. Burns
Graduate Coordinator: Distinguished Professor Robert V. Burns

For additional information contact:

Mailing address: SDSU Box 504

Scobey Hall — SCO

E-mail: Robert_Burns@sdstate.edu

Phone: 605/688-4909

Fax: 605/688-5977

Political Science (PoLS) Course Offerings

PoLS 560 Topics in Political Science1-4

An intensive examination of significant political themes, issues, or problems. Topics will include, but are not limited to, the following: Republics and Self-Government; The Constitution and Civil Liberties; Parties, Elections and Campaigns; Presidential-Congressional Relationships.

PoLS 592 Special Problems.....1-2-3 FSSu

Individual guided research culminating in formal research paper. May be repeated until 6 credits are earned.

Psychology

Coursework only offered

Department Head: Associate Professor Virginia Norris

For additional information contact:

Mailing address: SDSU Box 504

Scobey Hall — SCO

WWW: <http://www.sdstate.edu/wpsy/http/homepage.html>

E-mail: sdsu_psycmain@sdstate.edu

Phone: 605/688-4322

Fax: 605/688-6754

Graduate Faculty

Virginia Norris.

*Associate Professor of
Psychology*

*Ph.D., Kent State University,
1991*

*Health Psychology,
Gerontology*

Psychology (Psyc) Course Offerings

Psyc 560 Topics in Psychology: (Topical)1-4
An intensive examination of significant psychological issues, themes, or problems. May be repeated as topic changes for a total of 8 credits. P, 101 or 102.

Psyc 592 Special Problems in Psychology..... 1-4 FSSu
Selected studies for advanced students. P, Psyc 101 or Psyc 102.

Rural Sociology

Degrees Offered:

Ph.D. Sociology

M.S. Rural Sociology

Graduate Faculty

Donald Arwood
Professor
Ph.D., South Dakota State
University, 1989
Research Methods,
Demography

Geoffrey Grant
Associate Professor
Ph.D., University of Nebraska,
Lincoln, 1980
Social Organization, Social
Change

Donna Hess
Distinguished Professor
Ph.D., Michigan State
University, 1974
Research Methods,
Comparative Sociology

Diane Kayongo-Male
Professor
Ph.D., Michigan State
University, 1974
Social Theory, Demography

Robert Mendelsohn
Professor
Ph.D., Western Michigan
University, 1973
Social Theory, Social Deviance

Ronald Stover
Professor
Ph.D., University of Georgia-
Athens, 1975
Anthropology, Industrial
Sociology

Department Head: Distinguished Professor Donna Hess

Graduate Coordinator: Distinguished Professor Donna Hess

For additional information contact:

Mailing address: SDSU Box 504

Scobey Hall — SCO

WWW: <http://web.sdstate.edu/departments/soc/>

E-mail: Donna_Hess@sdstate.edu

Phone: 605/688-4132

Fax: 605/688-6354

Program Description

The Master of Science program is designed to prepare students to continue their academic careers in advanced doctoral programs, enter such applied fields as planning, demography, criminal justice, and research or enter into the teaching profession.

The Ph.D. program in Sociology is designed to prepare students for professional careers in teaching, research and creative activity in academic, government and related areas. Areas of emphasis for a major in the Ph.D. program include demography, family studies, cultural ecology, social deviance and social organization.

Available Options for Graduate Degrees

See Page 129 for Options in the Master of Science degree in Rural Sociology.

Doctor of Philosophy: 60-Credit Plan
90-Credit Plan

See pages 15 (M.S.) and 18 (Ph.D.) for descriptions of available options.

Core Requirements

Master of Science: Social Theory, 6 hrs.
Research Methods, 6 hrs.
Doctor of Philosophy: Social Theory, 9 hrs.
Research Methods, 9 hrs.
Profession of Sociology, 3 hrs.
Graduate Statistics, 3 hrs.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

Both M.S. and Ph.D. candidates need a minimum of 24 credits of social science courses, of which 18 need to be in Sociology.

Master of Science: Courses in Research Methods, Social Theory, and Statistics must be completed as part of the previous work, or made up as prerequisites.

Doctor of Philosophy: Students seeking entrance must have an approved Bachelor's and Master's degree, (thesis option), not necessarily in Sociology.

General Requirements begin on page 13 (Master's Degree) and 18 (Ph.D.).

Graduate students should consult with their advisor before registering for graduate work.

Anthropology (Anth) Course Offerings

Anth 521 Indians of North America3 FSSu
Study of American Indian cultures and cultural change over time, from prehistory to present; with particular emphasis on D/N/Lakota cultures; unit on issues in American Indian education.

Anth 590 Special Problems1-3 FSSu
P, open to undergraduate and graduate students with sufficient background and consent of instructor.

Anth 597 Topics in Anthropology1-3 (on demand)
 Selected topics pertaining to theory and methods in cultural, physical anthropology and archaeology. P, undergraduate/graduate and consent of instructor.

Criminal Justice (CJus) Course Offerings

CJus 516 Problems in Criminal Justice3
 An examination of selected contemporary problems in the administration of criminal justice. Topic will change each semester. May be repeated for credit. Course descriptions available prior to term course is offered.

Sociology (Soc) Course Offerings

Soc 502 Social Deviance3
 This course will examine the nature of negatively evaluated behaviors and the process by which customs, rules and normative structure of society are constructed. A primary goal of the course is the development of a coherent interpretation of contemporary theories and empirical investigations of social deviance. P, undergraduate or graduate and consent of instructor.

Soc 533 Leadership & Group Organization 3
 Emergence of leadership patterns. Emphasis on group dynamics, small groups, and leadership in management. P, undergraduate or graduate and consent of instructor.

Soc 551 Juvenile Delinquency3 FS
 Causes of delinquency; patterns of delinquent behavior; Juvenile and alternative solutions currently in operation throughout the US which attempt to reduce the incidence of juvenile delinquency.

Soc 552 Sociology of Corrections3
 An examination of the history of adult and juvenile treatment and punishment. Emphasis is upon contemporary community based treatment as well as traditional prison-based incarceration. The process of sentencing, particularly the role of the PSI is covered. Special attention is devoted to internship and career possibilities in the corrections arena.

Soc 560 Advanced Criminology3
 A variable topics course concentrating on the most current trends and issues in the field of Criminology. The class is a lecture-discussion seminar format. Topics regularly covered in past seminars have been: terrorism, middle and upper level drug use and dealing, computer crime, organized crime, crime in corporate America, and ethnic-group criminal activities.

Soc 580 Sociology of Law3
 This course focuses on the relationship between law and society. Topics focus on the organization of law in society, law and social control, law as a method of conflict resolution, law as a mechanism of social change, law as a profession, and methods of inquiry in research. The course will also look at alternative dispute resolution techniques, for example mediation. Comparative, and cross-cultural materials will be used throughout the class to emphasize diversity in law. P, 351.

Soc 585 Applied Sociology3 F
 This course articulates the use of sociological concepts in practical settings. Applied and clinical approaches will be explored. A theoretical model for applied sociology will be developed and applied to businesses, organizations, medicine, aging, youth, law, communities, criminal justice, recreation, social service, educational facilities, and additional areas of student interest.

Soc 620 Social Organization3
 Elements of social organization. Analysis of social groups and complex social organizations. Examination of conditions and factors related to the integration and disintegration of social organizations. P, consent.

Soc 621 Social Stratification3
 Theories of social stratification. Relationship between social class and education, occupational choice, political preference religious affiliation and social mobility. P, consent.

Soc 630 Social Change..... 3
 Theories concerning factors and processes in social-cultural change. Consideration of various interpretations of social-cultural change in terms of stages, cycles, and trends. P, consent.

Soc 640 Rural Community Planning3
 Changes occurring in rural areas and their effects upon rural communities. Basic concepts, procedures, and processes for planning in a rural environment. Some alternative approaches to rural planning. National and International perspectives. P, consent of instructor.

Master of Science Program*

Option A, Thesis

Traditional master's degree program designed to prepare students to enter post-secondary teaching and/or continuation toward the doctorate.

Option B, Research/Design Paper

Designed to prepare students to enter such applied fields of research, criminal justice, demography, family studies, or planning and development.

Option C, Non-Thesis

Designed for elementary- and secondary-level teachers and social service personnel not in need of the research emphasis offered in Options A and B.

Doctor of Philosophy Program*

Areas of concentration:

- Demography
- Social Deviance
- Social Organization
- Family Studies
- Cultural Ecology

*See department for Graduate Guide for detailed information and course scheduling.

Key to Course Descriptions

Course Number & Name
 Credits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

Courses with no FSSu notation are offered either FS or FSSu.

Course Description as written by department and approved by the Board of Regents.

P = Prerequisite

Soc 709 Evaluation Research	3 S
Focus on the conceptualization and design of evaluation studies of various governmental programs. Design includes clarification of objectives, selection of appropriate collection techniques, and specification of target groups.	
Soc 710 Research Methods	3 S
Major emphasis will be given to research design, problems of measurement, methods of data collection, and analysis and interpretation of data. An integral part of the course will be the development of a research project dealing with some current sociological problem. P, Soc 307, 308, or consent.	
Soc 711 Qualitative Research Methods	3 F
Qualitative research methods of data collection, analysis, and presentation are examined; emphasis on fieldwork involving participant observation and intensive interviewing; includes consideration of the rationale, theoretical under pinnings and limitation of qualitative research. P, consent.	
Soc 712 Sociological Theory I	3 F
Critical examination of the main schools of sociological theory beginning with the system of Auguste Conte and ending with World War II. P, Soc 401 or consent.	
Soc 713 Sociological Theory II	3 S
Sociological theories and issues from World War II to present. P, Soc 401 or consent.	
Soc 714 Theory Construction	3
Focus on theory-building efforts; criteria for development of theories and general approaches to theory construction are covered. These general approaches are examined in depth; various critical approaches to theory development are reviewed.	
Soc 716 Symbolic Interaction	3
Focus on major micro-sociological perspective. Basic concepts, assumptions, and key propositions on development of this perspective. Recent applications and critiques of the perspective are examined.	
Soc 720 Profession of Sociology	3 S
Course designed for those planning a career in teaching Sociology at the college/university level; course is applied with "hands-on" experiences in preparation for college teaching.	
Soc 762 Applied Demography	3
Focus on demographic publications and resources including Census data material; areas included are population, housing, agriculture, economics, vital statistics reports, special surveys and international materials. Emphasis on a variety of applications across disciplines.	
Soc 764 Modern Demographic Theory	3
Overview of the explanatory factors and determinants related to the population process of fertility, mortality, and migration. Emphasis on theoretical models that focus on developed and developing countries.	
Soc 766 World Population Issues	3
Focus on policy formulation and program evaluation as related to population issues; the political economy of national and international efforts are considered; planning a micro- and macro-level decision-making is examined; issues covered are population and resources, the value of children, international migration and major health problems.	
Soc 780 Special Problems in Sociology	1-3 FSSu
Advanced work or special problems in such areas as population, marriage and family, rural sociology, criminology, social organization or urban sociology. P, open to graduate students with sufficient background and consent.	
Soc 781 Internship in Planning	1-6 FSSu (Pass/Fail)
P, Major and Planning option. P/F grade.	
Soc 790 Thesis	1-7 (Pass/Fail)
Soc 791 Thesis Sustaining	0 FSSu
Soc 792 Seminar	1-4 FSSu (on demand)
<ol style="list-style-type: none"> 1. Sociology of Religion 2. Advanced Social Psychology 3. Domestic Violence 4. Extra-Ordinary Groups 	
Soc 890 Dissertation, Ph.D. as arranged	1-12 (Pass/Fail)
Soc 891 Dissertation Ph.D. Sustaining	0 FSSu

Veterinary Science

Degree Offered:

- Ph.D. Biological Sciences
 - Veterinary Science area of study
- M.S. Animal Science
 - Veterinary Science emphasis
- M.S. Biological Sciences
 - Veterinary Science Option

Department Head: Professor David H. Zeman
Graduate Coordinator: Associate Professor Chris Chase

For additional information contact:

Mailing address: SDSU Box 2175
Animal Disease Research — ADR
WWW: <http://www.vetsci.sdstate.edu>
E-mail: Christopher_Chase@sdstate.edu

Phone: 605/688-5172
Fax: 605/688-6003

Program Description

Graduate education in the department of Veterinary Science is focused on animal health science, with major emphasis in infectious diseases of food-producing domestic species. Research projects range from basic (mechanistic) to applied science. Students are usually not accepted into the program unless an assistantship can be provided. Funding for assistantships comes from a variety of sources including the South Dakota Agricultural Experiment Station, federal granting agencies, and the animal health product industry.

Available Options for Graduate Degrees

Doctor of Philosophy: 60-Credit Plan
90-Credit Plan
See page 15 for descriptions of available options.

Core Requirements

Research in pursuit of the dissertation requirement is expected to address a question of fundamental scientific importance and is expected to generate data of publication quality.

Additional Admission Requirements

GRE: Not required
TOEFL: Department requirement of 525

General Requirements begin on page 13 (Master's Degree) and 18 (Ph.D.).

Graduate students should consult with their advisor before registering for graduate work.

Graduate Faculty

David Benfield
Professor
Ph.D., University of Missouri-
Columbia, 1979
Molecular Virology

Chris Chase
Associate Professor
D.V.M., Iowa State University,
1980
Ph.D., University of Wisconsin,
1990
Virology/Immunology

Jane Christopher-Hennings
Assistant Professor
D.V.M., University of
Minnesota, 1983
M.S., University of Wisconsin,
1990
Molecular Diagnostics and
Research

Bill Epperson
Associate Professor
D.V.M., Ohio State University,
1985
M.S., Ohio State University,
1990
Veterinary Epidemiology

Alan Erickson
Associate Professor
Ph.D., North Dakota State
University, 1989
Biochemistry

Veterinary Science (Vet) Course Offerings

- Vet 503 Animal Diseases and Their Control3 F**
- Vet 524 Medical and Veterinary Virology4 S (odd years)**
Basic course discussing the characterization, structure, and replication of viruses and the pathogenesis of viral disease in man and animals. Laboratory exercises emphasize techniques in virus isolation, characterization, and detection by immunological assays. P, Micr 422 or consent. Cross-listed with Micr 424/524.
- Vet 524A Medical and Veterinary Virology Lab0**
- Vet 590 Problems in Veterinary Science.....1-3 FSSu**
Consent of department head required.

David Francis
 Professor
 Ph.D., University of Missouri-
 Columbia, 1978
 Bacteriology

Eddie Hamilton
 Associate Professor
 D.V.M., Texas A & M
 University, 1974
 M.Agr., Texas A & M
 University, 1992
 Livestock Production
 Economics

Eric Nelson
 Associate Professor
 Ph.D., South Dakota State
 University, 1993
 Molecular Virology

David H. Zeman
 Professor
 D.V.M., Oklahoma State, 1980
 Ph.D., Louisiana State
 University, 1986
 Pathology

Vet 723 Systemic Physiology4 F (odd years)
 Physiological aspects of tissue cells, hematology, neuroendocrine system, central and autonomic nervous systems, and myology. Discuss various interrelationships to body system functions and maintenance of homeostasis. P, Vet 223 or consent of instructor.

Vet 723A Systemic Physiology Lab.....0

Vet 792 Special Problems1-4 FSSu
 Independent study in specialized areas of biomedical sciences including bacteriology, virology and pathology. Objectives, scope of work, and plan of study specified by the professor and student(s). P, consent of Department Head.

Vet 793 Special Topics1-3 FSSu
 Advanced studies including Techniques of Electron Microscopy and other specific topics in Physiology, Pathology, Serology and other Related Topics and Techniques. Maximum: 1-4 credits per topic (course). 6 credit hours per degree. P, consent of Department Head.

Biological Sciences (BioS) Course Offerings

BioS 890 Dissertation—Ph.D.....1-7 FSSu

BioS 891 Dissertation Sustaining0 FSSu

BioS 892 Ph.D. Seminar1 FS

Wildlife and Fisheries Sciences

Degrees Offered:

Ph.D. Biological Sciences, *See page 37*

- Wildlife Science area of study
- Fisheries Science area of study

M.S. Wildlife and Fisheries Sciences

- Wildlife Option
- Fisheries Option

Department Head: Professor Charles Scalet
Graduate Coordinator: Professor Charles Scalet

For additional information contact:

Mailing address: SDSU Box 2140B

Northern Plains Biostress Laboratory — NPB

WWW: <http://wfs.sdstate.edu>

E-mail: wildlifefish@abs.sdstate.edu

Phone: 605/688-6121

Fax: 605/688-4515

Program Description

Department research, and therefore graduate research education, is usually directed toward 1) wildlife-fisheries-agriculture interactions, 2) wetlands, or 3) biostress. The majority of research activity in the Department is of an applied field nature that revolves around habitat, users, and organisms, both game and non-game. The Department houses the S.D. Cooperative Fish and Wildlife Research Unit, which is a cooperative effort among SDSU; the S.D. Department of Game, Fish and Parks; the U.S. Department of the Interior; and the Wildlife Management Institute. In general, students are not accepted into the Department's graduate program unless an assistantship can be provided. The Department cooperates with a variety of internal and external funding entities to support research projects.

Available Options for Graduate Degrees

Master of Science: Option A

Doctor of Philosophy: 60-Credit Plan
90-Credit Plan

See pages 15 (M.S.) and 18 (Ph.D.) for descriptions of available options.

Core Requirements

Master of Science: Students are expected to take coursework in statistical methods and graduate seminars.

Doctor of Philosophy: Students must be proficient in statistical methods and computer application. Courses and experience are also required in college-level teaching and graduate and Ph.D. seminars.

Additional Admission Requirements

GRE: Required

TOEFL: Department Requirement of 525

General Requirements begin on page 13 (Master's Degree) and 18 (Ph.D).

Graduate students should consult with their advisor before registering for graduate work.

Graduate Faculty

Charles R. Berry

Professor

*Ph.D., Virginia Polytechnic
Institute and State University,
1976*

Fish Physiology

Michael L. Brown

Associate Professor

*Ph.D., Texas A & M University,
1993*

*Fish Culture, Fisheries
Management*

Steven R. Chipps

Assistant Professor

*Ph.D., University of Idaho,
1997*

Aquatic Ecology

Lester D. Flake

Distinguished Professor

*Ph.D., Washington State
University, 1971*

Wildlife Ecology

Kenneth F. Higgins

Professor

*Ph.D., North Dakota State
University, 1981*

Wildlife Management

Daniel E. Hubbard

Professor

*Ph.D., South Dakota State
University, 1988*

Wetland Ecology

Jonathan A. Jenks
Associate Professor
Ph.D., Oklahoma State
University, 1991
Population Dynamics, Wildlife
Ecology

Charles G. Scalet
Professor
Ph.D., University of Oklahoma,
1971
Fisheries Biology

David W. Willis
Professor
Ph.D., Colorado State
University, 1980
Fisheries Management

**Philosophy Statement for
Master of Science Degree
in Wildlife and Fisheries
Sciences**

*This degree is intended to
educate students for
management-level positions
with state and federal
agencies, private companies,
and for the pursuit of higher
academic degrees.*

*It is our goal to build on the
foundation that students
obtained during their
undergraduate education,
primarily directing them into
some more specific area of
wildlife or fisheries. By using
specifically identified
coursework areas and
mentoring we will strive to
assist students in developing
their intellectual capabilities
in working with natural
resources and people. In
addition, each student must
propose and conduct an
original scientific
investigation.*

*An M.S. degree involves a
full-time commitment normally
requiring two to three years to
complete.*

Wildlife and Fisheries Sciences (WL) Course Offerings

- WL 513* Advanced Fisheries Management.....3 F (even years)**
Principles and techniques of selected practices for reservoir, lake, pond, and lotic fisheries management. P, WL367, WL412, and/or consent of instructor.
- WL 513A Advanced Fisheries Management Lab0**
- WL 515* Upland Game Ecology and Management3 F (even years)**
Upland game birds and mammals as components of ecosystems. Effects of farming; industry; social change; technology; and federal, state, and private programs on game and non-game species. Techniques for individual species management. P, 411 and/or consent of instructor.
- WL 515A Upland Game Ecology and Management Lab0**
- WL 517* Large Mammal Ecology and Management3 S (even years)**
Large mammal life histories and distributions. Relationships of nutrition, reproduction, interspecific competition, and predation to management of big game habitat and harvest. Techniques for research and management of large mammals. P, 411 and/or consent of instructor.
- WL 517A Large Mammal Ecology and Management Lab.....0**
- WL 519* Waterfowl Ecology and Management3 F (odd years)**
Analysis of ecological and socio-economic factors affecting waterfowl habitat and waterfowl populations. State and federal programs affecting wetland drainage and wetland preservation. Field inspection of waterfowl production habitat in the north-central states. P, 411 and/or consent of instructor.
- WL 519A Waterfowl Ecology and Management Lab0**
- WL 521* Grassland Fire Ecology 3 F (even years)**
The course is designed to describe the ecological effects of fire on grassland ecosystems. It also provides insight into the history of fires, the people who used them and why, the parts of a fire, how fires behave in relation to fuel and weather, and the conducting and safety of prescribed burns. P, consent of instructor. Cross-listed with Rang 421/521.
- WL 521A Grassland Fire Ecology Lab..... 0**
- WL 523* Fish Culture 3 F (odd years)**
Extent and potential for aquaculture. Emphasis placed on culture methods of important commercial and sport fishes and invertebrates of North America. P, consent of instructor.
- WL 523A Fish Culture Lab 0**
- WL 593 Special Topics in Wildlife & Fisheries1-3 FSSu**
Students may secure small-group instruction in a variety of special topics. Contact department head concerning planned special topics. P, graduate or senior undergraduate and consent of instructor.
- WL 712* Wetland Ecology and Management.....3 F (odd years)**
Botanical, zoological, hydrological, pedological, and biogeochemical components of wetland systems are studied. Course includes the management of wetlands for various functional values, government jurisdiction in wetland regulation, and wetland classification. North American wetland systems are discussed with emphasis on northern glaciated prairie wetlands. P, consent of instructor.
- WL 712A Wetland Ecology and Management Lab..... 0**
- WL 713* Animal Population Dynamics3 F (even years)**
Methods of analysis and interpretation of vital statistics of animal populations. Current theories on natural regulation of animal populations. Particular emphasis on vertebrate species of economic and/or recreational importance. Comparison of environmental controls on populations of various animal groups. P, consent of instructor.
- WL 713A Animal Population Dynamics Lab.....0**
- WL 714* Fish Structure and Function3 S (odd years)**
Emphasis on anatomy, physiology, and histology of fishes and how these areas relate to fish management, water pollution, and fish culture. Economically important game and cultured species are stressed. P, consent of instructor.
- WL 714A Fish Structure and Function Lab0**
- WL 715* Wildlife Research Design3 S (odd years)**
Use of the scientific method for designing wildlife research and developing proposals. Familiarization of field and laboratory methods and instrumentation. Practical experience with computer and statistical models for data analysis. P, consent of instructor.

WL 715A Wildlife Research Design Lab	0
WL 717* Advanced Limnology	3 S (even years)
Analysis of selected biological processes influencing the organization of aquatic communities. Complex tropic interactions and their effects on the life histories and bioenergetics of aquatic organisms are examined. P, consent of instructor.	
WL 717A Advanced Limnology Lab	0
WL 718* Ecology of Aquatic Invertebrates	3 F (even years)
Involves the identification of and ecological relationships associated with aquatic invertebrates. Aquatic habitats of the north central states are stressed. P, consent of instructor.	
WL 718A Ecology of Aquatic Invertebrates Lab	0
WL 719* Stream Ecology and Management	3 F (odd years)
Interrelationships of biotic and abiotic components of lotic ecosystems. Hydrologic and geologic influences on lotic habitat and biotia will be stressed, as well as watershed management aspects. P, consent of instructor.	
WL 719A Stream Ecology and Management Lab	0
WL 790 Thesis	1-7 FSSu
WL 791 Thesis Sustaining	0 FSSu
WL 792 Graduate Seminar	1 FS
Reports and discussions of current topics in wildlife and fisheries research and management. Not more than 2 credits may be applied toward the graduate degree.	
WL 793 Research Problems	1-3 FSSu
Individualized instruction on specific research problems. P, consent of instructor.	

Biological Sciences (BioS) Course Offerings

BioS 890 Dissertation—Ph.D.	1-7 FSSu
BioS 891 Dissertation Sustaining	0 FSSu
BioS 892 Ph.D. Seminar	1 S

*Field trips required in these courses may result in pro-rata charges to defray transportation costs.

South Dakota has a great diversity of fisheries and wildlife resources. These resources represent an excellent outdoor laboratory for students interested in natural resources.

The eastern portion of the state, referred to as East River because of its location east of the Missouri River, is primarily farmland interspersed with numerous wetlands, shelterbelts, wooded draws and rivers, and glacial lakes. Primary wildlife and fish species include ring-necked pheasants, gray partridge, songbirds, shorebirds, a wide variety of ducks and geese, white-tailed deer, furbearers, walleyes, northern pike, yellow perch, and others.

The western half of the state (West River) is primarily grazing land, but there is some small grain farming along with prairie rivers, badland areas, and the Black Hills. Wildlife and fish species include salmonids, largemouth bass, pronghorns, mule deer, white-tailed deer, turkeys, sharp-tailed grouse, greater prairie-chickens, numerous raptors, and others.

The state is bisected by the Missouri River and its impoundments. Many fish and wildlife species, both game and nongame, occur in this corridor.

Philosophy Statement for the Ph.D. Degree in Biological Sciences (Wildlife and Fisheries Sciences)

This degree is intended to educate students for upper-level management, research, and administrative positions with state and federal agencies, and private companies. It is also intended to prepare students in the teaching, research, and service component responsibilities needed for faculty positions with universities and colleges.

By building on the educational foundation that these students obtained from bachelor's and master's degree work, we will endeavor to raise them to a higher intellectual plateau. While coursework is involved, this is primarily a research and mentoring educational experience.

This degree requires original thought and research contributions, synthesis and development of information, and contributions to the world and its resources. Through mentoring and other educational experiences we desire to bring spirit, enthusiasm, imagination, and optimism to these students. They must develop independence, mature judgement, and a tolerance of differences among people, but an intolerance to inferior products and nonprofessional attitudes. We will strive to help these students become both operationally and conceptually creative.

A Ph.D. degree involves a full-time commitment normally requiring three to five years of effort beyond the M.S. degree.

As of May 2000

- Ackman, John D.**, Associate Professor of Communication Studies and Theatre, 1978, 1997; B.S., SDSU, 1978; M.F.A., University of Montana, 1984.
- Adamson, Dwight W.**, Associate Professor of Economics, 1989, 1995; B.A., Washington State University, 1976; M.A., 1983; Ph.D., 1988.
- Adelaine, Michael F.**, Director of Agricultural Information Technology, Associate Professor of Agricultural and Biosystems Engineering, 1990, 1995; B.S., Michigan State University, 1974; M.S., University of Nebraska, 1985; Ph.D., 1989.
- Anderson, Gary A.**, Professor of Agricultural and Biosystems Engineering, 1987, 1999; B.S., SDSU, 1975; M.S., Iowa State University, 1985; Ph.D., 1987.
- Andrawis, Alfred S.**, Associate Professor of Electrical Engineering, 1981, 1996; B.S., Alexandria University, 1974; M.S., SDSU, 1982; Ph.D., Virginia Polytechnic Institute and State University, 1991.
- Andrawis, Madeleine Y.**, Associate Professor of Electrical Engineering, 1980, 1996; B.S., Cairo University, 1977; M.S., SDSU, 1983; Ph.D., Virginia Polytechnic Institute and State University, 1991.
- Arwood, Donald E.**, Professor of Rural Sociology, 1986, 1999; B.S., SDSU, 1980; M.S., 1982; Ph.D., 1989.
- Baer, Robert J.**, Professor of Dairy Science, 1982, 1992; B.S., University of Georgia, 1977; M.S., 1979; Ph.D., 1983.
- Bahr, Ann Marie B.**, Professor of Philosophy and Religion, 1988, 1999; B.A., Lawrence University, 1972; M.A., Stanford University, 1975; Ph.D., Temple University, 1989.
- Baker, Phillip R.**, Professor and Head of Modern Languages, 1973, 1985; B.A., University of Connecticut, 1959; M.A., Middlebury College, 1965; M.A.T., University of Hartford, 1968; Ph.D., Florida State University, 1973.
- Baron, Mark**, Adjunct Faculty
- Bassett, Kurt D.**, P.E., Coordinator of IAC Lab, Associate Professor of Mechanical Engineering, 1982, 1997; B.S., SDSU, 1981; M.S., 1983; Ph.D., North Dakota State University, 1995.
- Bell, Rodney E.**, Professor and Head of History, 1970, 1980; B.S., Jamestown College, 1955; M.A., University of Michigan, 1956; Ph.D., 1975.
- Benfield, David A.**, Professor of Veterinary Science, 1979, 1989; B.S., Purdue University, 1973; M.S., 1976; Ph.D., University of Missouri, 1979.
- Berg, Donald J.**, Associate Professor of Geography, 1990, 1995; B.A., North Dakota State University, 1964; M.A., 1966; M.A., University of California, 1971; Ph.D., 1976.
- Bergum, Gerald E.**, Head of Computer Science, Professor of Mathematics, 1970, 1987; B.S., University of Minnesota, 1958; M.S., University of Notre Dame, 1962; Ph.D., Washington State University, 1969.
- Berry, Jr., Charles R.**, Adjunct Professor of Wildlife and Fisheries Sciences, 1985, 1991; B.S., Randolph-Macon College, 1967; M.S., Fordham University, 1970; Ph.D., Virginia Polytechnic Institute, 1976.
- Beutler, Martin K.**, Director of West River Agriculture Center and Professor, Extension Ranch Management Specialist, 1986, 1998; B.S., Utah State University, 1980; M.S., 1982; Ph.D., Purdue University, 1986.
- Bielfeldt, Dennis D.**, Associate Professor of Philosophy and Religion, 1995; B.S., SDSU, 1977; M.A., University of Iowa, 1984; Ph.D., 1987.
- Billow, Joye Ann**, Professor/Coordinator of Pharmaceutical Sciences, 1972, 1986; B.S., Temple University, 1966; Ph.D., 1972.
- Bleakley, Bruce H.**, Associate Professor of Biology and Microbiology, 1991, 1995; B.S., Michigan State University, 1978; M.S., 1981; Ph.D., University of Florida, 1986.
- Boe, Arvid A.**, Professor of Plant Science, 1976, 1991; B.A., Pacific Lutheran University, 1972; M.A., University of South Dakota, 1976; Ph.D., SDSU, 1979.
- Boggs, Donald L.**, Professor and Head of Animal and Range Sciences, 1988, 1998; B.S., University of Illinois, 1975; M.S., Kansas State University, 1977; Ph.D., Michigan State University, 1982.
- Booher, James M.**, Head of Athletic Training/Professor of Health, Physical Education and Recreation, 1967, 1983; B.A., Nebraska Wesleyan University, 1965; R.P.T., School of Physical Therapy, Mayo Clinic, 1967; M.S., SDSU, 1969; Ph.D., University of Utah, 1976.
- Boris, Greg**, Adjunct Faculty
- Boschee, Floyd**, Adjunct Faculty
- Brandt, Bruce E.**, Professor of English, 1979, 1989; B.A., University of Denver, 1969; M.A., 1971; Ph.D., Harvard University, 1977.
- Branum, Allen R.**, Assistant Dean of the College of Arts and Science, Director of Sioux Falls Center for Public Higher Education, Professor and Head of Psychology, 1970, 1999; B.S., Montana State University, 1966; M.A., University of Montana, 1968; Ph.D., 1971.
- Britzman, Mark J.**, Associate Professor of Education and Counseling, 1987, 1999; B.S., SDSU, 1982; M.ED., 1984; Ed.D., University of South Dakota, 1987.
- Brown, Larry H.**, Associate Professor and Head of Education and Counseling, 1999; B.S., Western Michigan University, 1967; M.A., Eastern Michigan State University, 1969; Ed.S., Michigan State University, 1977; Ph.D., Florida State University, 1979.
- Brown, Lewis F.**, Associate Professor and Head of Electrical Engineering, 1992, 1997; B.S., SDSU, 1984; M.S., Iowa State University, 1986; Ph.D., 1988.
- Brown, Michael**, Associate Professor of Wildlife and Fisheries Sciences, 1994; B.S., Arkansas Technical University, 1986; M.S., Texas A&M University, 1989; Ph.D., 1993.
- Burckhard, Suzette R.**, Assistant Professor of Civil and Environmental Engineering, 1997, 1998; B.S., SDSU, 1986; M.S. 1992, 1993 Kansas State University; Ph.D., 1997.
- Burns, Robert V.**, Distinguished Professor and Head of Political Science, 1970, 1994; B.S., SDSU, 1964; M.A., University of Missouri, 1966; Ph.D., 1973.
- Card, Karen**, Adjunct Faculty
- Carlson, C. Gregg**, Professor of Plant Science, Extension Specialist, 1974, 1994; B.S., Western Illinois University, 1969; M.S., SDSU, 1972; Ph.D., 1978.

- Carson, Paula P.**, Associate Professor of Nursing, 1983,1995; B.S.,SDSU, 1975; M.S.N., University of Minnesota, 1983; Ph.D., University of Arizona, 1992.
- Carter, Catherine D.**, Associate Professor of Plant Science, 1989; B.M.E., George Peabody College, 1971; B.S., 1975; M.S., 1976; Ph.D., University of Kentucky, 1982.
- Chappell, Gary S.**, Professor and Head of Pharmaceutical Sciences, 1973, 1987; B.S., Ohio State University, 1963; Ph.D., University of Kansas, 1968.
- Chase, Christopher**, Associate Professor, Animal Disease Research and Diagnostic Lab, 1992, 1996; D.V.M., Iowa State University, 1980; M.S., University of Wisconsin, 1987; Ph.D., University of Wisconsin, 1990.
- Chase, Thomas E.**, Associate Professor of Plant Science, 1990, 1995; B.S., State University of New York, 1979; Ph.D., University of Vermont, 1986.
- Cheesbrough, Thomas M.**, Associate Professor of Biology and Microbiology, 1990, 1995; B.S. University of Wyoming, 1976; M.S., 1978; Ph.D., Purdue University, 1982.
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- McCarty, J. Walter**, Associate Professor Emeritus of Animal Science, 1948, 1986; B.S., SDSU, 1947; M.S., University of Minnesota, 1948.
- McCone, William C.**, Associate Professor Emeritus of Animal Science, 1947, 1955; B.S., SDSU, 1943; M.S., 1950.
- McDaniel, Burruss**, Professor Emeritus of Plant Science, 1966, 1992; B.A., University of Alaska, 1953; M.S., Texas A&M University, 1961; Ph.D., 1965.
- Meyer, Edward L.**, Professor Emeritus of Communication Studies and Theatre, Supervisor of Speech and Hearing Center, 1965, 1976; B.A., Huron College, 1950; M.A., University of South Dakota, 1953; Ph.D., University of Minnesota, 1975.
- Miller, Bruce L.**, Professor Emeritus of Physics, 1955, 1988; B.S., SDSU, 1947; M.S., University of Kansas, 1951; Ph.D., 1953.
- Minyard, Joe A.**, Professor Emeritus of Animal Science, 1953, 1987; B.S., West Texas State University, 1951; M.S., SDSU, 1959.
- Moore, Raymond A.**, Professor Emeritus of Plant Science, Associate Dean/ Director Emeritus, 1956, 1974; B.S., SDSU, 1951; M.S., 1958; Ph.D., Purdue University, 1963.
- Morgan, Jr., Walter C.**, Professor Emeritus of Biology, Professor Emeritus of Animal Science, 1954, 1985; B.S., University of Connecticut, 1946; M.S., George Washington University, 1949; Ph.D., University of Connecticut, 1953.
- Murra, Gene E.**, Professor Emeritus of Economics, Extension Specialist, Graduate Faculty, 1959, 1977; B.S., SDSU, 1959; M.S., 1960; Ph.D., Ohio State University, 1963.
- Myers, Gerald A.**, Professor Emeritus of Biology, 1958, 1968; B.A., Kearney State College, 1951; M.A., University of Northern Colorado, 1957; Ph.D., SDSU, 1963.
- Omodt, Gary W.**, Professor Emeritus of Pharmaceutical Sciences, 1958, 1968; B.S., University of Minnesota, 1953; Ph.D., 1959.
- Palmer, Ivan S.**, Professor Emeritus of Chemistry and Biochemistry, 1955, 1973; B.S., SDSU, 1955; M.S., 1956; Ph.D., Pennsylvania State University, 1960.
- Pengra, Robert M.**, Professor Emeritus of Microbiology, 1957, 1981; B.S., SDSU, 1951; M.S., 1953; Ph.D., University of Wisconsin, 1959.
- Peterson, Evelyn T.**, Professor Emerita of Nursing, 1954, 1993; B.S., University of Washington, 1951; M.N., 1958; D.Nu.S., University of California, 1975.
- Peterson, Ronald M.**, Professor Emeritus of Horticulture-Forestry, 1953, 1987; B.S., Colorado State University, 1947; M.S., University of California, 1949; Ph.D., University of Minnesota, 1953.

- Prashar, Paul D.**, Professor Emeritus of Horticulture, 1960, 1978; B.S., Government Agricultural College, 1952; M.S., University of Minnesota, 1955; Ph.D., University of Missouri, 1960.
- Raney, A. Leon**, Professor/Dean of Libraries Emeritus, B.S., University of Central Arkansas, 1960, M.S., Louisiana State University, 1962, Ph.D., Indiana University, 1972.
- Richardson, Jay R.**, Professor Emeritus of Human Development, Consumer and Family Sciences, 1963, 1970; B.S., Brigham Young University, 1957; M.S., 1958; Ed.D., Pennsylvania State University, 1969.
- Romans, John R.**, Professor Emeritus of Animal and Range Sciences, 1962, B.S., Iowa State University, 1955; M.S., SDSU, 1964; Ph.D., 1967.
- Ruc, Rolland R.**, Professor Emeritus of Chemistry and Biochemistry, 1962, 1983; B.A., Macalester College, 1957; Ph.D., Iowa State University, 1962.
- Rollag, Dwayne A.**, P.E., Professor Emeritus of Civil and Environmental Engineering, 1965, 1979; B.S., University of Minnesota, 1959; M.S., SDSU, 1966; Ph.D., Purdue University, 1975.
- Sander, Duane E.**, Dean Emeritus of the College of Engineering, P.E., Professor Emeritus of Electrical Engineering, 1967, 1990; B.S., South Dakota School of Mines and Technology, 1960; M.S., Iowa State University, 1962; Ph.D., 1964.
- Sandfort, John F.**, Professor Emeritus of Mechanical Engineering, 1958; B.S., Ohio State University, 1933; B.S., 1934; M.S., Iowa State University, 1947.
- Satterlee, James L.**, Professor Emeritus of Rural Sociology, 1962, 1976; B.S., SDSU, 1962; M.S., 1963; Ph.D., 1970.
- Sauer, Howard M.**, Professor Emeritus of Rural Sociology, 1938, 1973; B.A., Drake University, 1929; M.A., Iowa State University, 1931.
- Scholten, Marvin**, Professor Emeritus of Education, 1956, 1985; B.A., University of Minnesota, 1949; M.A., University of South Dakota, 1950; Ed.D., 1967.
- Semeniuk, Alexandra O.**, Professor Emerita of Textiles, Clothing, and Interior Design, 1959, 1980; B.S., SDSU, 1955; M.S., 1961.
- Shank, D. Boyd**, Professor Emeritus of Plant Science, 1946, 1980; B.S., University of Nebraska, 1935; Ph.D., Iowa State University, 1941.
- Shubeck, Fred E.**, Professor Emeritus of Plant Science, 1951, 1985; B.S., SDSU, 1940; Ph.D., University of Minnesota, 1951.
- Skubic, Louis G.**, Professor Emeritus of General Engineering, 1953, 1985; B.S., University of Minnesota, 1947; M.A., 1953.
- Sogn, Arthur B.**, Associate Professor of Economics Extension Emeritus, 1968, 1974; B.S., SDSU 1948; M.S., 1959.
- Spinar, Leo H.**, Professor Emeritus of Chemistry and Biochemistry, Environmental Health and Safety Officer, 1966, 1970; B.A., University of South Dakota, 1951; M.S., University of Wisconsin, 1953; Ph.D., 1958.
- Stine, Lawrence C.**, Professor Emeritus of Communication Studies and Theatre, Director Emeritus of Theatre, Associate Dean Emeritus of Arts and Science, 1952, 1977; B.A., Butler University, 1947; M.A., University of Iowa, 1951; Ph.D., 1962.
- Stoflet-Gouldin, Dorothy**, Professor Emerita of Textiles, Clothing, and Interior Design, 1963, 1977; B.A., Coe College, 1933; M.S., Iowa State University, 1948.
- Storry, Junis O.**, Dean and Professor Emeritus of Engineering, Amdahl Distinguished Professor of Engineering, 1967, 1985; B.S., SDSU, 1942; M.S., 1949; Ph.D., Iowa State University, 1969.
- Taylor, Donald C.**, Professor Emeritus of Economics, 1980, B.S., Cornell University, 1959; M.S., University of Minnesota, 1964; Ph.D., 1965.
- Thompson, John E.**, Professor Emeritus of Economics, 1952, 1985; B.S., University of South Dakota, 1950; M.S., SDSU, 1953; Ph.D., University of Wisconsin, 1960.
- Tucker, William L.**, Agricultural Experiment Station Statistician/ Professor Emeritus of Mathematics and Statistics, 1963, 1972; B.S., University of Kentucky, 1952; M.S., North Carolina State University, 1957; Ph.D., 1963.
- Volstorff, Vivian V.**, Dean Emerita of Women, Professor Emerita of History, 1932, 1973; B.S., Northwestern University, 1928; M.A., 1929; Ph.D., 1932.
- Wadsworth, Jr., William S.**, Professor Emeritus of Chemistry, 1963, 1970; B.S., Trinity College, 1950; M.S., 1952; Ph.D., Pennsylvania State University, 1955.
- Wagner, Robert T.**, President Emeritus, Professor Emeritus of Rural Sociology, Distinguished Professor of Higher Education, 1970, 1997; B.A., Augustana College, 1954; M.Div., Seabury Western Theological Seminary, 1957; S.T.M., 1970; Ph.D., SDSU, 1972; L.H.D., Augustana College, 1994; D.P.S., SDSU, 1997.
- Walstrom, Robert J.**, Professor Emeritus of Plant Science, 1955, 1988; B.S., University of Nebraska, 1947; M.S., 1949; Ph.D., Iowa State University, 1955.
- Webster, Victor S.**, Professor Emeritus of Chemistry, 1936, 1974; B.A., Iowa State University, 1930; M.S., 1931; Ph.D., 1933.
- Wells, Darrell G.**, Professor Emeritus of Plant Science, 1962, 1985; B.S., SDSU, 1941; M.S., State College of Washington, 1943; Ph.D., University of Wisconsin, 1949.
- Westin, Frederick C.**, Professor Emeritus of Plant Science, 1947, 1986; B.S., University of Wisconsin, 1941; M.S., 1947; Ph.D., 1952.
- White, Everett M.**, Professor Emeritus of Plant Science, 1954, 1990; B.S., Iowa State University, 1948; M.S., 1950; Ph.D., 1953.
- Whitehead, Eugene I.**, Professor Emeritus of Chemistry, 1941, 1983; B.S., SDSU, 1939; M.S., 1941.
- Widvey, Harold W.**, Professor Emeritus of Communication Studies and Theatre, 1972, 1978; B.S.Ed., Northern State College, 1957; M.S.Ed., 1961; Ph.D., University of Nebraska, 1971.
- Widvey, Lois I.**, Distinguished Professor Emerita of Education, 1973, 1998; B.S., Northern State College, 1955; M.S.Ed., 1958; Ed.D., University of Nebraska, 1971.
- Wiersma, John L.**, Professor Emeritus of Agricultural Engineering, 1943, 1983; B.S., SDSU, 1943; M.S., 1950; Ph.D., University of California, 1970.
- Williams, Perry W.**, Professor Emeritus of Physics, 1945, 1979; B.A., Dakota Wesleyan University, 1936; M.S., SDSU, 1940.
- Williamson, Warren E.**, Professor Emeritus of Health, Physical Education and Recreation, 1956, 1987; B.S., SDSU, 1951; M.S., 1954; Dir. in Rec., Indiana University, 1969.
- Wills, Rena**, Professor Emerita of Nutrition and Food Science, 1952, 1976; B.S., Iowa State University, 1940; M.S., 1946.
- Witherington, Paul**, Professor Emeritus of English, 1970, 1993; B.A., Baylor University, 1954; M.A., University of Texas, 1960; Ph.D., 1964.
- Yarbrough, Jerry W.**, Professor Emeritus of English, 1968, 1976; B.A., Abilene Christian University, 1960; M.A., University of Texas, 1962; Ph.D., 1968.

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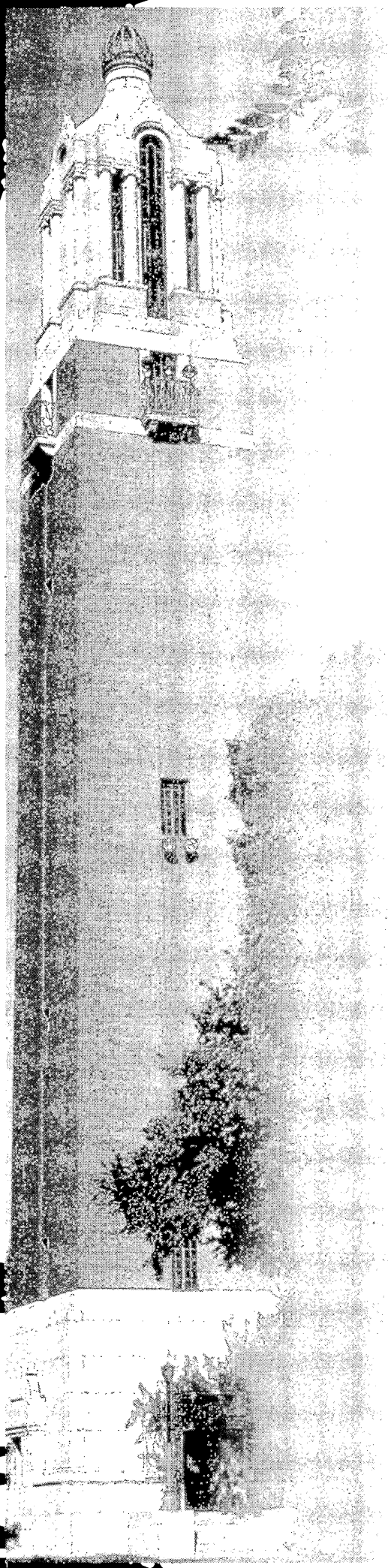
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APPLICATION MATERIALS

Application for Admission

Application Procedure

Processing of an application will begin only when the application form, application fee, transcripts, letters of recommendation, and test data as required by department are received in the Graduate School. If an applicant fails to complete the application file for the term proposed to begin graduate work, a new date of entry will need to be specified.

Complete application files will include:

1. Complete, signed application form. Please fill in requested information by typing or printing in ink. An application form is included at the back of this Bulletin.
2. \$15.00 application fee. This fee is non-refundable, regardless of what action is taken on the application for admission.
3. Official transcripts from each higher education institution attended. These transcripts must be sent directly from the institution to the Graduate School. Transcripts "Issued to Student" are unofficial. The earned Bachelor's Degree must be noted on the undergraduate transcript. When an incomplete transcript is furnished in support of the application, a complete transcript will be required by the end of the first semester of coursework.
4. Two letters of recommendation. These are required from persons acquainted with the applicant's academic record. Three letters are required of applicants into the Nursing program; two additional letters of recommendation are required for CHRD (please contact the department for the forms). Signed letters of recommendation may be submitted on plain paper or letterhead, if desired, or recommenders may use the forms included in the back of this Bulletin.
5. The GRE test is required of all applicants into Biology, Chemistry (strongly recommended), Electrical Engineering, English, HPER, Microbiology, Pharmaceutical Sciences, Plant Science, and Wildlife and Fisheries.
6. Some programs require additional admission materials. Applicants should consult the specific requirements for each program.
7. The TOEFL score is required of all international students. This score must be an original score, a copy of a verifiable score, or a certified copy of the original score sheet.
8. Applications and all related documents should be mailed to:

Graduate School
South Dakota State University
Administration Bldg 130
Box 2201
Brookings, SD 57007-1998



Graduate School Admission Application

South Dakota State University
Box 2201, Brookings, SD 57007-1998

Applying as a graduate student for the first time at SDSU

Reapplying

BIOGRAPHICAL INFORMATION

Legal Name	LAST	FIRST	MIDDLE	OTHER	PREFERRED NAME
Permanent Address	Street, RFD, or Box		City	State or Country	Zip Code
Local Address (all SDSU correspondence will be sent to this address)	Street, RFD, or Box		City	State or Country	Zip Code
Phone (Home)	-	-	(Work)	-	(E-mail)
Social Security Number	-	-	Birth Date		
Emergency Contact	Name	Daytime Phone Number	Relationship		
Citizenship:	<input type="checkbox"/> USA	<input type="checkbox"/> Resident Alien	<input type="checkbox"/> Other (specify citizenship)	Country of Birth	
Have you obtained a visa?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	If yes, type of visa:	Date of initial entry into the U.S.	
Have you lived in South Dakota for the past 12 months?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	If no, please explain		
What state or country are you a legal resident of?			County within the state in which you reside		

EDUCATIONAL BACKGROUND

University Granting Bachelor's Degree	Degree	Date Received	
List ALL Colleges/Universities Attended:			
School Name	City	State	Dates Attended
Standardized admissions tests taken (GRE, MAT, TOEFL) minimum TOEFL of 525 required			
Have you ever been dismissed from any college?	<input type="checkbox"/> Y <input type="checkbox"/> N	If yes, when and for what reason?	Name of Test Latest date test taken Score
Have you ever applied for admission to another graduate school?	<input type="checkbox"/> Y <input type="checkbox"/> N	If yes, what college?	Were you admitted? <input type="checkbox"/> Y <input type="checkbox"/> N

PROFESSIONAL OBJECTIVE

Term Graduate Work desired	Indicate Spring/Summer/Fall	Year	
Are you planning on working on a master's or doctoral degree at SDSU?	<input type="checkbox"/> Master's	<input type="checkbox"/> Doctoral	<input type="checkbox"/> No, I am applying as a special student (not pursuing a degree)
If yes, what program of study do you plan to pursue?	Major Department		
Have you previously applied as a Graduate Student at SDSU?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	If yes, when?

ADDITIONAL INFORMATION

This information is used for institutional research and Federal reports. Your responses will in no way affect your admission. Please circle your answers.			
SEX: Male	Female	DISABILITY: Audio	Visual Learning Disabled Mobility-Ambulatory Mobility-Wheelchair
MARITAL STATUS: Married	Unmarried	ETHNIC GROUP: American Indian	Asian African American Hispanic White Other Unknown

Providing your social security number is voluntary. Refusal to disclose this information will not affect your eligibility for admission. The number will be used solely for record-keeping purposes to provide positive identification. If you are admitted, your social security number will appear upon your official transcript; thus, it may be disclosed to outside parties, but only under those conditions that permit disclosure of the transcript.

SDSU offers all educational programs, materials, and service to all people without regard to age, race, color, religion, sex, handicap, or national origin. SDSU is an Equal Opportunity/Affirmative Action Employer.

All answers I have given on this application are accurate and true, and any intentional misrepresentation may be cause for revocation of admission. If admitted, I agree to observe the rules of the South Dakota Board of Regents and to pay all fees and charges assessed.

Signature of Applicant _____ Date _____



Graduate School
Admin. Bldg. 130

Graduate School Personal Reference Form

To the Applicant:

This form should be given to professors who are able to comment on your qualifications for graduate study. You should not request a recommendation from a non-academic person unless you have been away from academic institutions for some time. In that case, you should request the recommendation from someone knowing your academic ability.

A. Applicant's Name _____ Degree Sought _____

B. Applicant's Social Security Number _____ Graduate Program _____

C. List the courses you took under the direction of the person completing this form, if applicable.

Course Number	Course Title	When Taken	Grade

D. Describe personal contact with person furnishing reference:

Applicant's Waiver of Right to Access

The Family Educational Rights and Privacy Act of 1974, as amended, (PL 93-380), allows a candidate for admission to waive his or her right of access to confidential letters or statements written in his or her behalf if the recommendation is used solely for the purposes of admission and if the candidate, upon request, is notified of the names of all persons making such recommendations on his or her behalf. The University does not require that you make such a waiver as a condition for admission. However, under the legislation you have the option of signing such a waiver as follows:

I hereby voluntarily waive, do not waive my right to examine this confidential evaluation.

Name _____ Date _____ Signature _____
Please Print

To the Person Completing This Form:

The applicant named above has applied for admission to the Graduate School of South Dakota State University. Please complete this personal reference form and return it as soon as possible. If you have not had the applicant as a student, you may prefer to write a separate letter and attach it to this form. If you do not know this student well, please feel free to say so; such frankness will not prejudice the candidate's chance of admission.

- I have verified that the courses listed in item C were taken under my direction. Yes No
- I do not know the student well enough to give him or her a recommendation. (If you check this box, you do not need to complete the rest of this form.)
- Please check the educational level of the representative group with whom the applicant is compared:
 College Juniors College Seniors First-Year Graduate Students Advanced Graduate Students
- I would be pleased to have the applicant working under my direction as a: Research Assistant Administrative Assistant
 Teaching Assistant Fellowship

5. Summary Evaluation: In comparison with a representative group of students in the same field who have had approximately the same amount of experience and training, how do you rate the applicant in general research and scholarly ability?

- Truly Exceptional** Equivalent to the very best you have known, a person who, in your experience, appears only every few years.
- Outstanding** Comparable to the best student in the current class. Highest 5%.
- Very Good** Next highest 5%.
- Good** Ability easily identifiable, but not in upper 10%. Probably in upper 15%. Certainly upper 25%.
- Above Average** Probably upper 25%.
- Average** Upper 50%.
- Below Average** Lower 50%, but recommended.

6. Some gifted individuals make mediocre scholastic records. Is the applicant's scholastic record, if you know it, an accurate index of his or her scholastic ability? Yes No Don't know

If your answer is "No," please explain briefly, possibly giving consideration to the applicant's performance in independent study or in research participation programs.

7. Do you know of any matters related to character and responsibility or to physical and mental health which should be considered by an admissions committee or will have to be taken into account in planning for the applicant's graduate work?

8. What is your estimate of the applicant's promise as a graduate student? Give views on such matters as his/her accomplishments, intellectual independence, research interests, capacity for analytical thinking, ability to work with others, ability to organize and express ideas clearly (orally or in writing), drive, and motivation.

9. Recommendations for Admission

Master's Program

Doctoral Program

- | | | |
|-----------------------------------|--------------------------|--------------------------|
| I strongly recommend for | <input type="checkbox"/> | <input type="checkbox"/> |
| I recommend for | <input type="checkbox"/> | <input type="checkbox"/> |
| I recommend with reservations for | <input type="checkbox"/> | <input type="checkbox"/> |
| I do not recommend for | <input type="checkbox"/> | <input type="checkbox"/> |

Signature of recommender _____ Date _____

Name _____ Title _____
Print or type

Institution _____

Address _____ Telephone _____



Graduate School
Admin. Bldg. 130

Graduate School Personal Reference Form

To the Applicant:

This form should be given to professors who are able to comment on your qualifications for graduate study. You should not request a recommendation from a non-academic person unless you have been away from academic institutions for some time. In that case, you should request the recommendation from someone knowing your academic ability.

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I hereby voluntarily waive, do not waive my right to examine this confidential evaluation.

Name _____ Date _____ Signature _____
Please Print

To the Person Completing This Form:

The applicant named above has applied for admission to the Graduate School of South Dakota State University. Please complete this personal reference form and return it as soon as possible. If you have not had the applicant as a student, you may prefer to write a separate letter and attach it to this form. If you do not know this student well, please feel free to say so; such frankness will not prejudice the candidate's chance of admission.

- I have verified that the courses listed in item C were taken under my direction. Yes No
- I do not know the student well enough to give him or her a recommendation. (If you check this box, you do not need to complete the rest of this form.)
- Please check the educational level of the representative group with whom the applicant is compared:
 College Juniors College Seniors First-Year Graduate Students Advanced Graduate Students
- I would be pleased to have the applicant working under my direction as a: Research Assistant Administrative Assistant
 Teaching Assistant Fellowship

5. **Summary Evaluation:** In comparison with a representative group of students in the same field who have had approximately the same amount of experience and training, how do you rate the applicant in general research and scholarly ability?

- Truly Exceptional** Equivalent to the very best you have known, a person who, in your experience, appears only every few years.
- Outstanding** Comparable to the best student in the current class. Highest 5%.
- Very Good** Next highest 5%.
- Good** Ability easily identifiable, but not in upper 10%. Probably in upper 15%. Certainly upper 25%.
- Above Average** Probably upper 25%.
- Average** Upper 50%.
- Below Average** Lower 50%, but recommended.

6. Some gifted individuals make mediocre scholastic records. Is the applicant's scholastic record, if you know it, an accurate index of his or her scholastic ability? Yes No Don't know

If your answer is "No," please explain briefly, possibly giving consideration to the applicant's performance in independent study or in research participation programs.

7. Do you know of any matters related to character and responsibility or to physical and mental health which should be considered by an admissions committee or will have to be taken into account in planning for the applicant's graduate work?

8. What is your estimate of the applicant's promise as a graduate student? Give views on such matters as his/her accomplishments, intellectual independence, research interests, capacity for analytical thinking, ability to work with others, ability to organize and express ideas clearly (orally or in writing), drive, and motivation.

9. **Recommendations for Admission** **Master's Program** **Doctoral Program**

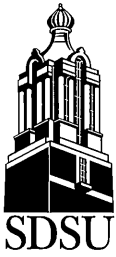
- | | | |
|-----------------------------------|--------------------------|--------------------------|
| I strongly recommend for | <input type="checkbox"/> | <input type="checkbox"/> |
| I recommend for | <input type="checkbox"/> | <input type="checkbox"/> |
| I recommend with reservations for | <input type="checkbox"/> | <input type="checkbox"/> |
| I do not recommend for | <input type="checkbox"/> | <input type="checkbox"/> |

Signature of recommender _____ Date _____

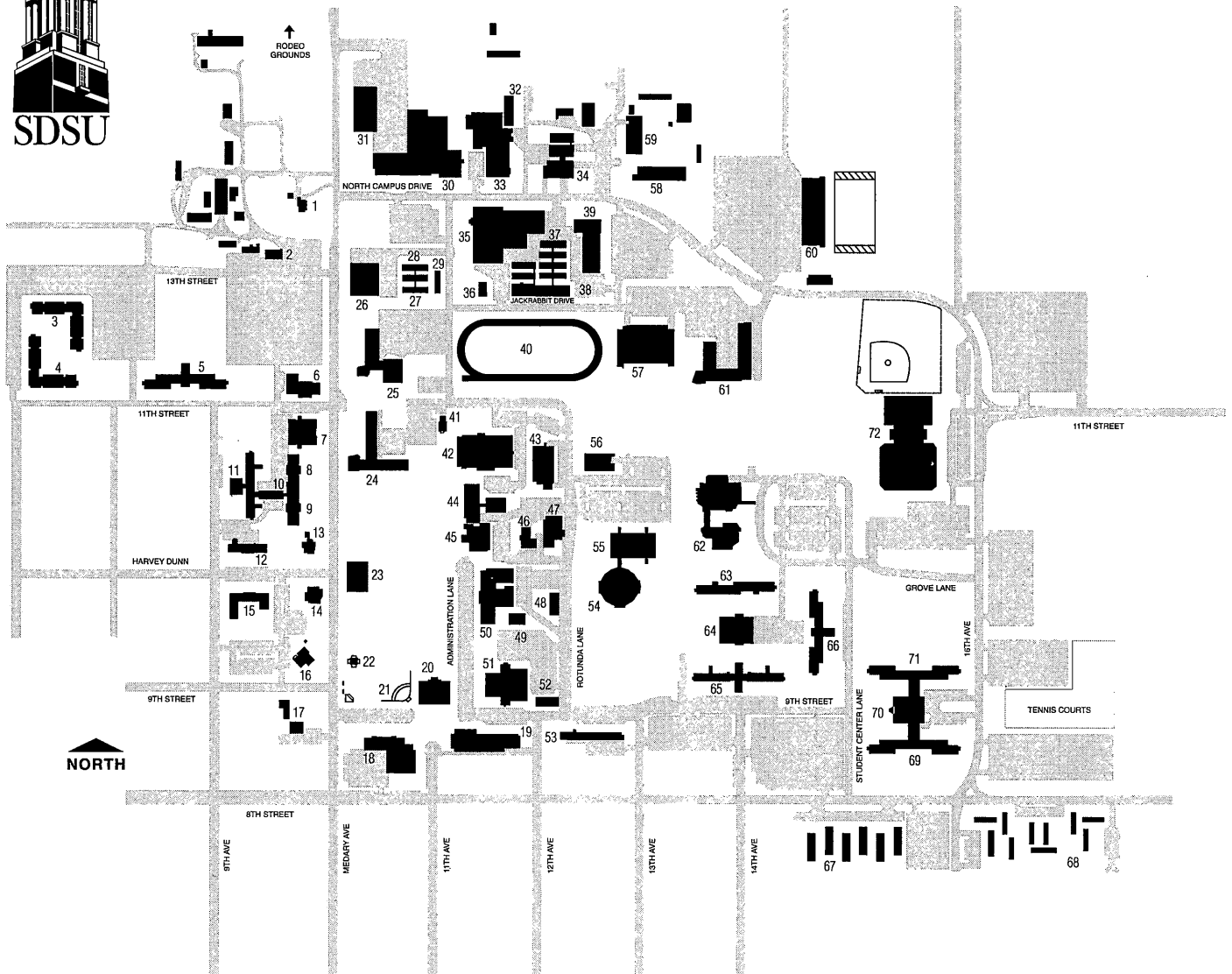
Name _____ Title _____
Print or type

Institution _____

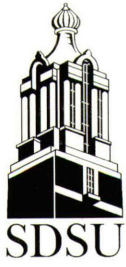
Address _____ Telephone _____



SDSU CAMPUS MAP



Administration Building (Doner Auditorium).....	50	Guilford C. Gross Pharmacy Building.....	45	Sexauer Field	40
Agricultural Communications Center.....	49	Hansen Hall	5	Shepard Hall	44
Agricultural Engineering.....	61	Harding Hall	53	Solberg Hall.....	51
Agricultural Hall.....	24	Heat / Power Laboratory	46	South Dakota Art Museum.....	23
Agricultural Heritage Museum	6	H. M. Briggs Library	57	South Dakota State University Foundation	17
Alvilda M. Sorenson Family Resource and Management Center (FRMC)	14	Horticulture & Forestry.....	39	Stanley J. Marshall HPER Center (Frost Arena & Huether Field)	72
Animal Disease Research and Diagnostic Laboratory.....	33	Industrial Arts Building	52	State Court	67
Animal Science Arena.....	31	Intramural Building	42	State Village.....	68
Animal Science Complex.....	30	Larson Commons (Food Service)	70	Tompkins Alumni Center (SDSU Alumni Association)	16
Bailey Hall.....	3	Lincoln Music Hall (Peterson Recital Hall).....	20	University Police Department	14
Berg Hall.....	4	Mathews Hall.....	63	University Relations (CMC)	48
Binnewies Hall.....	69	Medary Commons (CAP Center, Food Service).....	7	University Stores and Services.....	59
Biology Annex.....	41	Motor Pool Complex	2	University Student Union (Volstorff Ballroom, Food Service, Dept. of Student Activities, & Bookstore)	62
Brown Hall.....	65	Northern Plains Biostress Laboratory	35	Veterinary Isolation Building	32
Central Heating Plant	47	Nursing, Family & Consumer Sciences, and Arts & Science Building (NFA).....	55	Waneta Hall	11
Communications Center (University Relations).....	48	Physical Plant Shops	58	Wecota Annex.....	10
Coolidge Sylvan Theatre	21	Physiology Laboratory	36	Wecota Hall.....	9
Coughlin-Alumni Stadium	60	Pierson Hall	66	Wenona Hall	8
Coughlin Campanile.....	22	Plant Science Building & Greenhouse	38	West Hall.....	12
Crothers Engineering Hall.....	19	Plant Science Seedhouse	26	West Head House	28
Dairy Microbiology	25	Plant Science West Greenhouses	27	Wheat Commission Greenhouse.....	29
Dean of Agriculture Residence	1	Printing & Journalism Building (US Post Office, Central Mail, & Print Lab).....	43	Woodbine Cottage (President's Residence).....	13
DePuy Military Hall.....	56	Pugsley Continuing Education Center (RDTN Studios/Classrooms, Christie Ballroom).....	18	Young Hall	7
East Head House	37	Rotunda for Arts and Science	54		
Foundation Seed Conditioning Plant	34	Rotunda for Arts and Science	54		
Grove Hall.....	64	Scobey Hall.....	15		



South Dakota State University

GRADUATE SCHOOL

Box 2201

Brookings, SD 57007