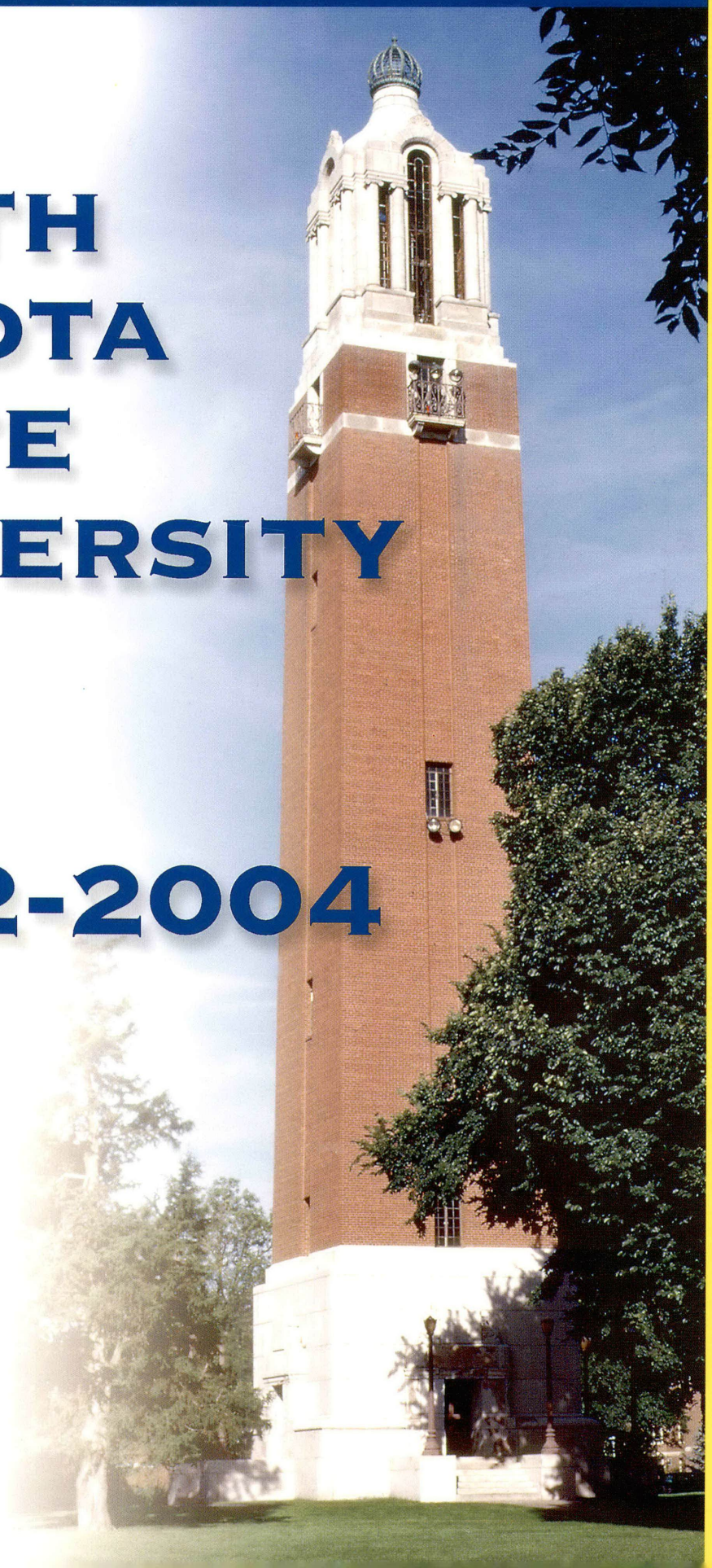
South Dakota State University Bulletin

SOUTH DAKOTA STATE UNIVERSITY

2002-2004



A Land-Grant University
established in 1881

GRADUATE PROGRAMS

ACADEMIC CALENDAR

2002 Fall Term

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

September 2, Monday ..... Labor Day Holiday
September 3, Tuesday ..... Registration and Orientation
September 4, Wednesday ..... Instruction begins
September 13, Friday ..... Last day to drop or add and adjust final fees
September 20, Friday ..... Last day to submit a graduation application for Fall 2002
October 5, Saturday ..... Hobo Day
October 14, Monday ..... Native American Day Holiday
October 16, Wednesday ..... "W" grade begins
October 22, Tuesday ..... First half Fall Term ends
October 25, Friday ..... Deficiency reports due in Registrar's Office, ADM 208, by 5:00 p.m.
November 11, Monday ..... Veterans Day Holiday
November 12, Tuesday ..... Last day to drop a course
November 28, 29, Thursday-Friday ..... Thanksgiving Recess
December 13, Friday ..... Last day of classes, Fall 2002
December 14, Saturday ..... Graduation, 10:00 a.m.
December 16-20, Monday - Friday ..... Final examinations
December 26, Thursday ..... Grades due in Registrar's Office not later than 5:00 p.m.

2003 Spring Term

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

January 8, Wednesday ..... Registration and Orientation
January 9, Thursday ..... Instruction begins
January 17, Friday ..... Last day to drop or add and adjust final fees
January 20, Monday ..... Martin Luther King, Jr. Day Holiday
February 4, Tuesday ..... Last day to submit a graduation application for Spring 2003
February 17, Monday ..... Presidents' Day Holiday
February 24, Monday ..... "W" grade begins
March 3-7, Monday-Friday ..... Spring Break
March 10, Monday ..... First half Spring Semester ends
March 13, Thursday ..... Deficiency reports due in Registrar's Office, ADM 208, by 5:00 p.m.
March 31, Monday ..... Last day to drop a course
April 18-21, Friday-Monday ..... Easter Recess
May 2, Friday ..... Last day of classes, Spring 2003
May 3, Saturday ..... 117th Annual Commencement, 10:00 a.m.
May 5-9, Monday-Friday ..... Final examinations
May 14, Wednesday ..... Grades due in Registrar's Office not later than 5:00 p.m.

2003 Summer Term

May 12 , (Monday) - June 6 (Friday) ..... Session 1
May 26, Monday ..... Memorial Day Holiday
June 9, (Monday) - July 3 (Thursday) ..... Session 2
July 4, Friday ..... Independence Day Holiday
July 7, (Monday) - August 1 (Friday) ..... Session 3
August 4, (Monday) - August 29 (Friday) ..... Session 4
May 12 (Monday) - August 29 (Friday) ..... Summer Term

2003 Fall Term

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

September 1, Monday ..... Labor Day Holiday
September 2, Tuesday ..... Registration and Orientation
September 3, Wednesday ..... Instruction begins
September 12, Friday ..... Last day to drop or add and adjust final fees
September 19, Friday ..... Last day to submit a graduation application for Fall 2003
October13, Monday ..... Native American Day Holiday
(Not determined at this date) ..... Hobo Day
October 15, Wednesday ..... "W" grade begins
October 21, Tuesday ..... First half Fall Term ends
October 24, Friday ..... Deficiency reports due in Registrar's Office, ADM 208, by 5:00 p.m.
November 10, Monday ..... Last day to drop a course
November 11, Tuesday ..... Veterans Day Holiday
November 27, 28, Thursday-Friday ..... Thanksgiving Recess
December 12, Friday ..... Last day of classes, Fall 2003
December 13, Saturday ..... Graduation, 10:00 a.m.
December 15-19, Monday-Friday ..... Final examinations
December 24, Wednesday ..... Grades due in Registrar's Office not later than 5:00 p.m.

2004 Spring Term

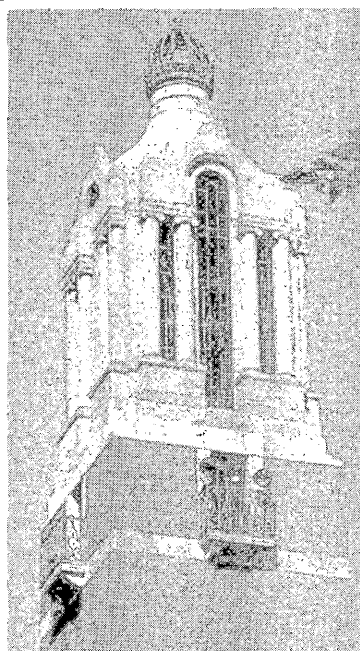
(1 day registration, 73 class days, 5 exam days)

January 7, Wednesday ..... Registration and Orientation
January 8, Thursday ..... Instruction begins
January 16, Friday ..... Last day to drop or add and adjust final fees
January 19, Monday ..... Martin Luther King, Jr. Day Holiday
February 3, Tuesday ..... Last day to submit a graduation application for Spring 2004
February 16, Monday ..... Presidents' Day Holiday
February 23, Monday ..... "W" grade begins
March 1, Monday ..... First half Spring Term ends
March 4, Thursday ..... Deficiency reports due in Registrar's Office, ADM 208, by 5:00 p.m.
March 8-12, Monday-Friday ..... Spring Break
March 29, Monday ..... Last day to drop a course
April 9-12, Friday-Monday ..... Easter Recess
April 30, Friday ..... Last day of classes, Spring 2004
May 1, Saturday ..... 118th Annual Commencement, 10:00 a.m.
May 3-7, Monday-Friday ..... Final examinations
May 12, Wednesday ..... Grades due in Registrar's Office not later than 5:00 p.m.

2004 Summer Term

May 10, (Monday) - June 4 (Friday) ..... Session 1
May 31, Monday ..... Memorial Day Holiday
June 7, (Monday) - July 2 (Friday) ..... Session 2
July 5, Monday ..... Independence Day Holiday
July 6, (Tuesday) - July 30 (Friday) ..... Session 3
August 2, (Monday) - August 27 (Friday) ..... Session 4
May 10 (Monday) - August 27 (Friday) ..... Summer Term

6,500 copies of this document were printed at an approximate cost of $1.33 per document by the SDSU Graduate School. GS009 8/02



South Dakota State University

Graduate Bulletin 2002 - 2004

SDSU

www3.sdstate.edu/academics/graduateschool/

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

Volume 92 **Number 3** **September 2002**

The South Dakota State University Bulletin Quarterly USPS 474-180 is published quarterly by South Dakota State University, Box 2230, Brookings, SD 57007-1498. Periodical Postage Paid at Brookings, SD. Postmaster: Send address changes to South Dakota State University Bulletin Quarterly, Box 2230, Brookings, SD 57007-1498.

The information contained in this bulletin is the most accurate available at the time of publication, but changes may become effective before the next bulletin is printed. It is 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, curricular 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://www3.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: **www3.sdstate.edu**. Information more specific to the graduate school can be reached at: **www3.sdstate.edu/Academics/Graduateschool/Index.cfm** 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 18,500. 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

Table of Contents

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 Equal Opportunity Office in Personnel Services, ADM 324, Phone: 605/688-4128.

Board and Council Members, Administration

— Board of Regents —

Honorable Robert T. (Tad) Perry
Pierre
Executive Director

Honorable James O. Hansen
Pierre
Term expires March 31, 2007

Honorable Harvey C. Jewett, IV
Aberdeen
Term expires March 31, 2005

Honorable Curtis Jones
Britton
Term expires March 31, 2003

Honorable Pat Lebrun
Rapid City
Continues to serve

Honorable Randall K. Morris
Spearfish
Term expires March 31, 2004

Honorable Rudolph Nef
Milbank
Term expires March 31, 2004

Honorable Shane C. Penfield
Student Regent
Vermillion
Term expires July 1, 2002

Honorable Jack Rentschler
Sioux Falls
Term expires March 31, 2003

— Graduate Council —

David C. Hilderbrand .....Chair; Dean of Graduate School; Professor of Chemistry

Bruce L. Currie .....Professor and Head of Pharmaceutical Sciences
Term expires 2004

Martin A. Draper .....Associate Professor of Plant Science
Term expires 2005

R.L. Erion.....Professor and Acting Department Head, Education and Counseling
Term expires 2005

Donell P. Froehlich .....Professor and Head of Mechanical Engineering; Professional Engineer
Term expires 2003

Douglas C. McFarland .....Professor of Animal and Range Sciences
Term expires 2003

Steve R. Marquardt.....Dean of Libraries; Professor of Library Science
Ex-officio

R. Neil Reese .....Professor of Biology/Microbiology
Term expires 2004

John J. Ruffolo .....Associate Dean of Graduate School/Office of Research
Ex-officio Professor of Biology and Microbiology

Mary R. Ryder .....Professor of English
Term expires 2003

Ronald G. Stover .....Professor of Rural Sociology
Term expires 2004

Thomas P. West .....Professor, Station Biochemistry
Term expires 2005

— SDSU Administration —

Peggy Gordon Miller .....President
Ed.D., Indiana University, 1975 *Professor of Education*

Carol J. Peterson .....Provost and Vice President for Academic Affairs
Ph.D., University of Minnesota-Minneapolis/St. Paul, 1969 *Professor of Nursing*

Michael P. Reger .....Vice President for Administration
Ph.D., The Ohio State University, 1983 *Assistant Professor of Education*

Edward P. Hogan .....Associate Vice President for Academic Affairs and
Ph.D., Saint Louis University, 1969 Chief Information Technology Officer
Professor of Geography

— College Deans —

Lewis F. Brown .....Dean, College of Engineering
Ph.D., Iowa State University, 1988 *Professor of Electrical Engineering*

Fred A. Cholick.....Dean, College of Agriculture and Biological Sciences
Ph.D., Colorado State University, 1977 *Professor of Plant Science*

David C. Hilderbrand .....Dean, Graduate School; Director of Research and Sponsored Programs
Ph.D., University of Missouri, 1971 *Professor of Chemistry*

Jerry D. Jorgensen. .....Dean, College of Arts and Science
Ph.D., University of Nebraska, 1990 *Professor of Communication Studies and Theatre*

Danny Lattin .....Dean, College of Pharmacy
Ph.D., University of Minnesota, 1970 *Professor of Medicinal Chemistry*

Steve R. Marquardt .....Dean of Libraries
Ph.D., University of Minnesota, 1978 *Professor of Library Science*

Laurie Stenberg Nichols .....Dean, College of Family and Consumer Sciences
Ph.D., The Ohio State University, 1988 *Professor of Human Development, Consumer and Family Sciences*

Roberta Olson.....Dean, College of Nursing
Ph.D., Saint Louis University, 1984 *Professor of Nursing*

Henry H. ("Hank") Rubin .....Joint Dean of Education, SDSU/USD
Ph.D., Northwestern University, 1980 *Professor of Educational Administration*

Gail Dobbs Tidemann.....Dean, College of General Studies and Outreach Programs
Ph.D., University of Alabama, 1978 *Professor of Human Development, Consumer and Family Sciences*

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 elected members from the Graduate Faculty assists the Graduate Dean. The council includes the Graduate Dean (chair); associate dean, 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 advisors 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 Graduate School, Administration Building (ADM) 130, or at www3.sdstate.edu.

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 —
Engineering Commission of the Accreditation Board for Engineering and Technology

The Council for the Accreditation of Counseling and Related Educational Programs (CACREP)

American Council on Pharmaceutical Education (ACPE)

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

Degrees Offered

MAJOR

- Specialization

  Emphasis

Doctor of Philosophy

AGRICULTURAL ENGINEERING ***(in conjunction with Iowa State University)***

AGRONOMY

ANIMAL SCIENCE

ATMOSPHERIC, ENVIRONMENTAL AND WATER RESOURCES

BIOLOGICAL SCIENCES

- Agricultural and Biosystems Engineering
- Animal and Range Sciences
- Biology
- Dairy Science
- Fisheries Science
- Human Nutrition and Food Science
- Microbiology
- Molecular Biology
- Pharmaceutical Sciences
- Plant Science
- Plant Molecular Biology
- Veterinary Microbiology
- Veterinary Pathobiology
- Wildlife Sciences

CHEMISTRY

SOCIOLOGY

- Cultural Ecology
- Demography
- Family Studies
- Social Deviance
- Social Organization

Master of Arts

ENGLISH

Literature

Language and Rhetoric

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 have a baccalaureate degree from 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; English; Entomology; Microbiology; Pharmacy, Plant Pathology, and Wildlife and Fisheries. Chemistry recommends the GRE, but does not require it. 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 $35 if degree-seeking. An application form can be found at the back of this Bulletin or on the Internet.

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 and on the Internet. 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 paper-based or 197 computer-based or above is required by the Graduate School for the Test of English as a Foreign Language (TOEFL). 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 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

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 have been 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) have been maintained 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 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 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 9 graduate credits with grades of B or above before becoming eligible for a graduate assistantship. A student admitted conditionally must satisfy

Degrees Offered

MAJOR

- Specialization

  Emphasis

Master of Education

CURRICULUM AND INSTRUCTION

- Adult and Higher Education
- Career and Technical
  - *Agricultural Education*
  - *Instructional Technology*
- Elementary & Secondary
  - *Computer Education*
  - *Content Areas:*
    - *Biology*
    - *Chemistry*
    - *Mathematics*
    - *Physics*
    - *Others to be planned with advisor*
  - *English as a Second Language*
  - *Gifted Education*
  - *Middle School*
  - *Reading*

EDUCATIONAL ADMINISTRATION

- Adult and Higher Education
- Career and Technical Education
- Elementary Education
- Secondary Education

Master of Science

ANIMAL SCIENCE

- Genetics and Reproduction
- Meats, Muscle Biology & Growth
- Nutrition
- Range Science
- Production and Processing
- Veterinary Science

BIOLOGICAL SCIENCES

- Biology
- Dairy Science
- Food and BioMaterials Processing
- Horticulture Science
- Human Nutrition and Food Science
- Microbiology
- Pharmaceutical Science
- Veterinary Microbiology
- Veterinary Pathology

CHEMISTRY

COMMUNICATIONS STUDIES AND JOURNALISM

- Communications Studies
- Journalism

Degrees Offered

MAJOR
- Specialization
  Emphasis

COUNSELING AND HUMAN RESOURCES DEVELOPMENT
- Counseling in an Agency Setting
- Counseling in a School Setting
- Counseling in a Student Affairs Setting
- Administration of Student Affairs Programs

ECONOMICS
Agricultural Business
Agricultural Economics
Business Economics
General Economics

ENGINEERING
Agricultural and Biosystems Engineering
Civil and Environmental Engineering
Computer Science
Electrical Engineering
Mechanical Engineering
Physics

FAMILY AND CONSUMER SCIENCES
- Child and Family Studies
- Family Financial Planning
- Nutrition and Food Science

GEOGRAPHY

HEALTH, PHYSICAL EDUCATION AND RECREATION
Sports Pedagogy
Sports Science

INDUSTRIAL MANAGEMENT

MATHEMATICS

NURSING
- Administrator
- Clinical Nurse Specialists
- Educator
- Family Nurse Practitioner
- Neonatal Nurse Practitioner
- Psychiatric Nurse Practitioner

PLANT SCIENCE
- Agroecology
- Agronomy
- Crop Science
- Entomology
- Horticultural Crop Management
- Machinery Systems and Water Management
- Plant Pathology
- Soil Science
- Weed Science

RURAL SOCIOLOGY
- Applied Research
- Criminal Justice
- Demography
- Family Studies
- Planning/Development

WILDLIFE AND FISHERIES SCIENCES
- Fisheries
- Wildlife

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, 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 nine 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 or graduate coordinator 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.

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.

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 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. Transfer credits are limited to a maximum of 40% of the credits in the program. Credits earned at another institution as a part of an approved joint or cooperative degree program will not count as transfer credits for the purposes of this policy.

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.

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 evaluate 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:

	Minimum Credits	*Maximum credits without overload*
Full-Time M.S., Fall/Spring semesters	9	12
Full-Time Ph.D., Fall/Spring semesters	7	12
Half-Time M.S./Ph.D., Fall/Spring semesters...	5	
Full-Time, Summer Term, 4-week session.....	4	5
Full-Time, Summer Term, 8-week session	6	9

Maximum credits **graduate assistants** may carry:

	Academic Year	*Summer Term*
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.

Cancellation of Courses

In general, courses will not be offered to fewer than seven 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 normally 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. All courses taken at SDSU after a student has enrolled in any graduate course will be placed on the graduate transcript with the exception of students who are pursuing an undergraduate degree.

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 degrees are 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. 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.

Continual Registration 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, must continue to register for one credit for each succeeding semester including summer.

b. Students who miss the deadline for graduation in a given semester, but successfully complete their final orals and all other requirements except minor edits of their thesis or dissertation prior to the start of the next semester do not have to enroll for the semester they graduate.

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 and its website.

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 except in approved accredited accelerated programs.

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 that 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

	Options *A*	*B*	*C*
Minimum total	30	32	35
Minimum major *including thesis or research problem (if minor or supporting area required)**	19	19	19
Thesis	5-7	0	0
Research Problem	0	2-3	0
Minimum minor or supporting courses *(from two or more disciplines, if minor or supporting area required)***	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

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 modern foreign language.

Examinations

Comprehensive — In those majors and specializations 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 and present 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.

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. 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.

Electronic Thesis Submission — All masters candidates are required to submit their thesis in the appropriate format for electronic publication. Students should contact the Graduate School for appropriate guidelines.

Multiple Master's Degrees or Majors

Graduate students may pursue a second or additional master's degree in areas 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.

Continual Registration for Dissertation/Thesis/Research-Design Paper — See page 12.

Master's Degrees and Options

Major	*Degree*	*Options*		
Animal Science[1]	M.S.	A		
Biological Sciences	M.S.	A	B	*(Biology emphasis only)*
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[2] *(option C not available for Agricultural and Biosystems Engineering)*	M.S.	A	B	C
English	M.A.	A		C
Family and Consumer Sciences[3]	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[4]	M.S.	A		
Plant Science	M.S.	A	B	
Rural Sociology	M.S.	A	B	C
Wildlife and Fisheries Sciences	M.S.	A		

[1] *Department requires a minor/supporting area.*

[2] *M.S. in Engineering is available with coursework in:*
- *Agricultural and Biosystems Engineering*
- *Civil Engineering*
- *Computer Science*
- *Electrical Engineering*
- *Mechanical Engineering*
- *Physics*

[3] *M.S. in Family and Consumer Sciences is available with study in:*
- *Family Financial Planning*
- *Human Development, Consumer and Family Sciences*
- *Nutrition and Food Science*

[4] *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*

Master's Degree Checklist

Requirements	*When Due*
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. Comprehensive Written Examination	During the last semester of course work, at least two weeks before final oral examination
6. Filing of Graduation Application	After 20 graduate credits have been earned.
7. Thesis/Research-Design Paper submitted to Advisory Committee	During last semester of course work, at least two weeks before final oral examination
8. Thesis submitted to Graduate School	Within the first three weeks of final semester
9. Request for Scheduling Oral Examination	At least ten working days before final oral examination
10. Final Oral Examination	At least ten working days before commencement date
11. 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:
  Agricultural and Biosytems Engineering
  Animal and Range Sciences
  Biology
  Dairy Science
  Fisheries Science
  Human Nutrition and Food Science
  Microbiology
  Molecular Biology
  Pharmaceutical Sciences
  Plant Molecular Biology
  Plant Science
  Veterinary Microbiology
  Veterinary Pathobiology
  Wildlife Science
  Offered in cooperation with the University of South Dakota (USD).
- *Chemistry*
- *Sociology*
  Cultural Ecology
  Demography
  Family Studies
  Social Deviance
  Social Organization

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, or a professional with an outstanding academic record and/or knowledge in the field from outside the university.
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 except when an outside representative is used in "C" above. 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, it 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 it feels 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 and members of the Advisory Committee at least **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.

Electronic Dissertation Submittion — All doctoral candidates are required to submit their dissertations in the appropriate format for electronic publication. Students should contact the Graduate School for appropriate guidelines.

Continuing Dissertation Enrollment

See page 12, section titled "Continual Registration 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.

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 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

	Requirements	*When Due*
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 degree-seeking 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 —
$106.50 fee required during first semester of enrollment.

Tuition and Fees* – *Effective 5/13/02*

Tuition, per credit hour	*Cost*
Undergraduate Resident	$65.00
Undergraduate Non-Resident	206.65
Graduate Resident	98.65
Graduate Non-Resident	290.75
Graduate Assistant, graduate course	32.90

Fees, per credit hour	*Cost*
University Support Fee	$49.32
Activity Fee	13.43
Engineering Education Fee, per credit	16.12
Engineering/Science Lab fees, per course	22.40
Nursing Major Fee, per semester	153.55

See sidebars for special expenses.

**Effective Summer 2002 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 HOBO 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 and M.S. Option. 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 Proquest 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 WH 110, telephone 605/688-4504, TTD 688-4394.

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.

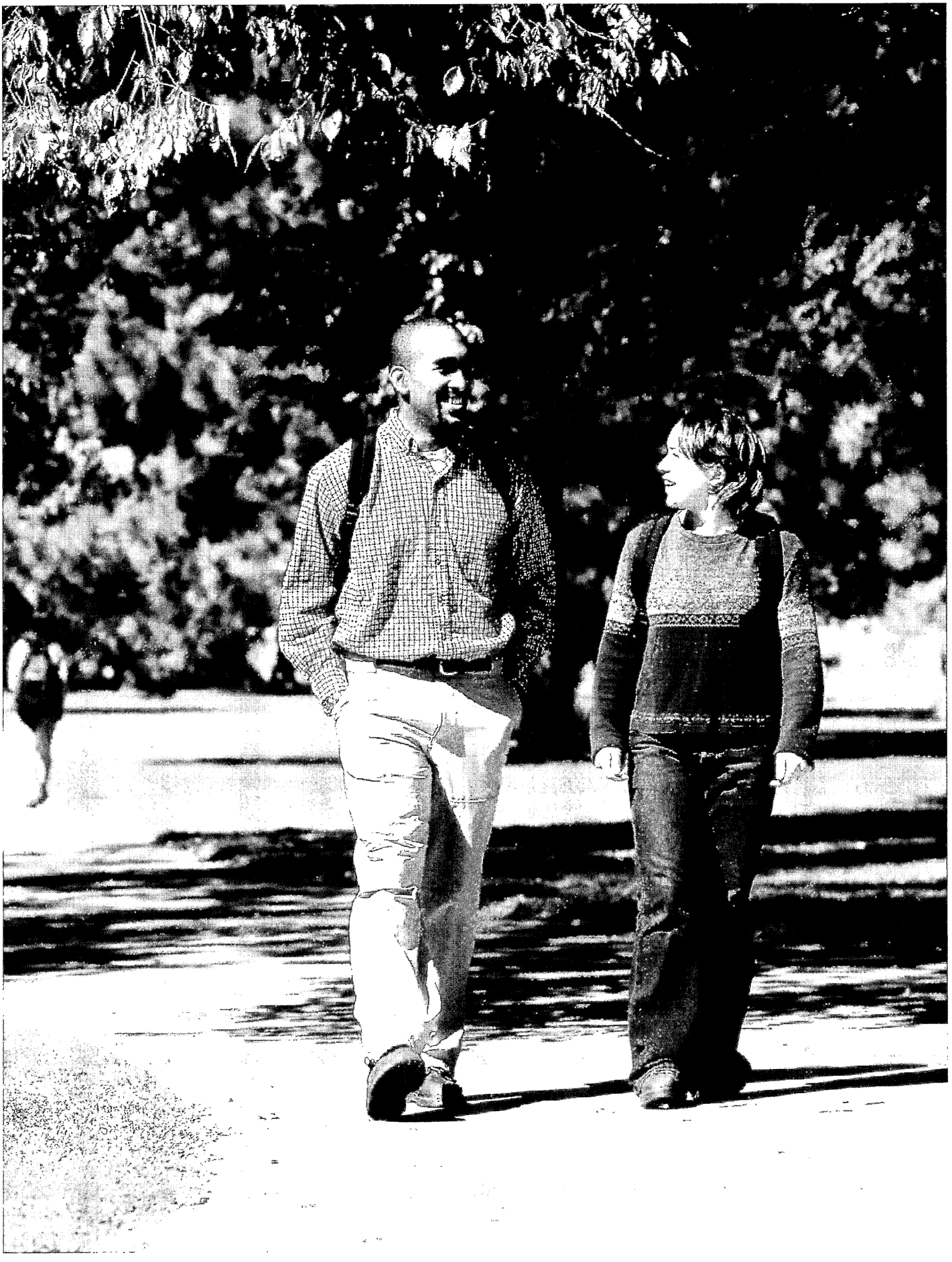
Native American Student Advising — The Native American Student Advisor is available to aid Native American students and is located in ADM 318, telephone 605/688-4126.

Special Expenses for Education Students —
Education students enrolled in selected Education courses are assessed a $127.80 one-time fee for Master's Level Internships.

Special Expenses for Engineering Courses —
A fee of $16.12 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 $22.40 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 $153.55 for the Graduate program. Students enrolled in the Family Nurse Practitioner program are assessed a fee of $545.40 per semester.



Departments of Instruction

Agricultural and Biosystems Engineering

Degrees Offered:

Ph.D. Agricultural and Biosystems Engineering *(cooperatively with Iowa State University)*

Ph.D. Biological Sciences

- Agricultural and Biosystems Engineering specialization

M.S. Engineering

- Agricultural and Biosystems Engineering specialization

M.S. Biological Sciences

- Food and Biomaterial Processing specialization

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
Associate Professor
Ph.D., University of Illinois-Urbana, 1999
Structural Analysis, Light Frame Structures

Kasiviswanathan Muthukumarappan
Associate Professor
Ph.D., University of Wisconsin, 1993
Food and Biomaterials Processing

Department Head: Associate Professor Van C. Kelley
Graduate Coordinator: Associate Professor Kasiviswanathan Muthukumarappan

For additional information contact:
Mailing address: SDSU Box 2120 *Phone: 605/688-5141*
Agricultural and Biosystems Engineering — ABE *Fax: 605/688-6764*
WWW: http://abe.sdstate.edu
E-mail: muthukum@sdstate.edu

Program Description

Graduate work in the Department of Agricultural and Biosystems Engineering leads to Master of Science and Doctor of Philosophy degrees. Depending on the educational background of the individual, a M.S. in Engineering with specialization in Agricultural and Biosystems Engineering or M.S. in Biological Sciences with specialization in Food and Biomaterial Processing may be earned. The Ph.D. in Biological Sciences with a specialization in Agricultural and Biosystems Engineering shares a common core with several other departments. The core is defined in this Bulletin on page 37. Additional classes are selected by the individual with the approval of the committee. A Ph.D. in cooperation with Iowa State University is also offered. The area of specialization pertaining to the cooperative Ph.D. is in natural resources engineering.

Students who undertake graduate studies in Agricultural and Biosystems Engineering normally have as their goal a better understanding of the current theories, principles, issues, and problems in agricultural and biological systems. Graduae studies improve the student's ability to think critically and creatively, to synthesize, analyze, and integrate ideas for decision-making and problem solving.

The department offers students an opportunity to undertake research and advanced study in specialization areas such as machine vision, food and biomaterial processing, physical properties of biological materials, natural resource engineering, structures, indoor environment, waste management and machine design.

Financial assistance in the form of research assistantships and project assistantships is available on a highly competitive basis.

Available Options for Graduate Degrees

Master of Science: Option A and Option B
Doctor of Philosophy: Dissertation
See pages 15 (M.S.) and 18 (Ph.D.) for descriptions of available options

Core Requirements

Refer to pages 36-38 and 78-80 for specific details regarding Ph.D. in Biological Sciences, M.S. in Biological Sciences, and M.S. in 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 and 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 and Machines 2
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, ABE 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, ABE 434 or consent.

ABE 533L Advanced Irrigation Engineering Lab 0
Corequisite course: ABE 533.

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. Corequisite course: ABE 544L.

ABE 544L Unit Operations of Biological Materials Processing Lab 0
Corequisite course: ABE 544.

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. Corequisite course: ABE 554L.

ABE 554L Advanced Unit Operations in Food/Biomaterials Processing Lab 0
Corequisite course: ABE 554.

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.

combined to this

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, ABE 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. Corequisite course: ABE 763L.

ABE 763L Instrumentation Lab 0
Corequisite course: ABE 763.

Todd P. Trooien
Associate Professor
Ph.D., Colorado State University, 1988
Soil and Water Engineering

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 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. Corequisite course: ABE 772L.

ABE 772L Similitude Lab 0
Corequisite course: ABE 772.

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. Corequisite course: ABE 773L.

ABE 773L Programming Agricultural Systems Lab.....0
Corequisite course: ABE 773.

ABE 787 Research 1-9

ABE 788 Research Report/ Design Paper .....1-2 FSSu (on demand)

ABE 790 Graduate Seminar 1
Discussion and reports of current topics and investigations in Agricultural and Biosystems Engineering. (Limit of 2 credits.)

ABE 791 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. Instructor's consent required.

ABE 792 Special Topics .....1-3 (on demand)

ABE 792L Special Topics Lab 1

ABE 798 Thesis .....1-7 FSSu

ABE 898D Dissertation, Ph.D. 1-12

Agricultural Systems Technology (AST) Course Offerings

AST 512 Hydraulic and Pneumatic Systems and Controls .....2 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. Corequisite course: AST 512L.

AST 512L Hydraulic and Pneumatic Systems and Controls Lab 0
Corequisite course: AST 512.

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. Corequisite course: AST 522L.

AST 522L Environmental Control in Structures Lab 0
Corequisite course: AST 522.

AST 562 Advanced Topics in Natural Resource Technology .....2 Su (odd years)
Examination of topics related to the natural resources management technologies. Potential topics include irrigation systems and water management, livestock waste facilities, soil erosion control, drainage systems and economics, wetlands, water supply and quality, watershed hydrology, water measurement and data acquisition equipment (may be repeated when topic is different.)

AST 582 Advanced Farm Engines .....2 Su (odd years)
Operation, selection, care, adjustment, and new development of internal combustion engines as applied to farm power units. Corequisite course: AST 582L.

AST 582L Advanced Farm Engines Lab 0
Corequisite course: AST 582.

AST 791 Special Problems .....1-3 FSSu
Instructor's consent required.

AST 792 Special Topics .....1-4 FSSu

Agriculture and Biological Sciences

Coursework for following degrees:

Ph.D. Agronomy, *see page 126*
Ph.D. Animal Science, *see page 31*
Ph.D. Biological Sciences, *see page 36*

M.S. Animal Science, *see page 31*
M.S. Biological Sciences, *see page 36*
M.S. Plant Science, *see page 126*

Agriculture and Biological Sciences (ABS) Course Offerings

ABS 701 Animal Systems .....1-10 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 Genetics .....1-10 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 Systems .....1-10 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 Systems .....1-10 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 Methodology .....1-10 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, hypbridization, 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

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

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 Management .....1-10 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; grown 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. Corequisite course: ABS 706L.

ABS 706L Natural Resource Management Lab 0
Corequisite course: ABS 706.

Animal and Range Sciences

Degrees Offered:

Ph.D. Animal Science

Ph.D. Biological Sciences, *see also page 36*

- Animal and Range Sciences specialization

M.S. Animal Sciences

- Genetics and Reproduction specialization
- Meats, Muscle Biology and Growth specialization
- Nutrition specialization, *see also page 61*
- Production and Processing Systems specialization, *see also pages 26, 61*
- Range Science specialization
- Veterinary Science specialization, *see also page 136*

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

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: 605/6888-5166
Fax: 605/688-6170

Program Description

This is a collaborative program among the Departments of Animal and Range Sciences, Dairy Science, Veterinary Science, and Agricultural and Biosystems Engineering. Successful completion of requirements leads to a Master of Science in Animal Sciences with specialization in Nutrition; Genetics and Reproduction; Meats, Muscle Biology and Growth; Range Science; Production and Processing Systems; or Veterinary Science.

This program allows for considerable latitude in the education and training of students. Identification of a major professor with resources to support the student's thesis project is required for unconditional acceptance into the program. An advisory committee will be formed for each student. The advisory committee will work with the student to design a unique and individualized plan of study to meet the interests and 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 and encouraged.

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

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

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

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

Core Requirements

1. Students are required to take AS 790, Thesis for 5-7 credits and AS 792, Seminar for 1-2 credits. This is a common experience seminar for all enrolled students.
2. At least three courses (8-9 credits) from the following courses are also required. Additional courses from this list may be taken toward the discipline course requirement. The courses will be determined by the student and their advisory committee and identified on the student's Plan of Study no later than the end of the first year of study.

ABE 554	Advanced Food/Biomaterials Processing	4 credits
ABS 705	Research Methodology	3 credits
ABS 706	Natural Resource Management	3 credits
AS 731	Experimental Procedures	3 credits
AS 750	Animal Growth and Development	3 credits
AST 522	Environmental Control in Structures	2 credits
Bot 727	Advanced Plant Physiology	4 credits
Chem 662	Principles of Biochemistry	3 credits
DS 731	Laboratory Techniques in Dairy Science	2 credits
DS/AS 711	Ruminology	3 credits
Stat 541	Statistical Methods II	3 credits
Vet 723	Systemic Physiology	4 credits

3. 12-14 credits of discipline specific courses are required of Option A students for a requirement of 30 credits total. The student, Major Advisor and Advisory Committee will select the discipline specific courses. The discipline courses prepare students in a specific emphasis area. The courses will be identified on the student's Plan of Study no later than the end of the first year of study.

Core Requirements for Doctor of Philosophy

2 credits of Graduate Seminar
Present seminar on dissertation

Additional Admission Requirements

TOEFL: required score of 550
GRE: Not required
Letter of interest and intent

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. Corequisite course: AS 732L.

AS 732L Advanced Physiology of Reproduction Lab **0**
Corequisite course: AS 732.

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 signaling 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. Corequisite course: 753L.

AS 753L Meat Science Lab **0**
Corequisite course: AS 753.

AS 790 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 798 Thesis ..... **1-7 FSSu (as arranged)**

AS 898D Dissertation, Ph.D. ..... **1-12 FSSu (as arranged)**

Biological Sciences (BioS) Course Offerings

BioS 890 Ph.D. Seminar ..... **1 FS**

BioS 898D Dissertation, Ph.D. ..... **1-7 FSSu**

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; crosslisted with WL 421-521. Equivalent to WL 521. Corequisite course: Rang 521L.

Rang 521L Grassland Fire Ecology Lab **0**
Equivalent to WL 521L. Corequisite course: Rang 521.

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
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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

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

Department Head: Professor Jane E. Hegland

For additional information contact:

Mailing address: SDSU Box 2275A
Nursing/Family/A&S — NFA
WWW:
http://www3.sdstate.edu/Academics/CollegeofFamilyAndConsumerSciences/ApparelMerchandisingandInteriorDesign/index.cfm

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 591 Special Problems **1-3**
Problems for independent study selected according to special interests and needs. Arranged by contract with instructor.

AM 592 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 790 Seminar in Apparel Merchandising and Textiles **1-2**

AM 791 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 591 Special Problems **1-3**
Problems for independent study selected according to special interests and needs. Arranged by contract with instructor.

ID 592 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.

Atmospheric, Environmental and Water Resources

Degree Offered:
Ph.D. Atmospheric, Environmental and Water Resources

Coordinator: Associate Professor Suzette R. Burckhard

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 and Biosystems Engineering, Chemistry and Biochemistry, Plant Science, Biology and Microbiology, Geography 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 and Atmospheric Sciences.

Core Requirements
A program core will be required of all students, which includes four courses and seminars taken by all students in the joint program. These courses are chosen to give every student in the program breadth of knowledge across the three disciplines. This core consists of a course in each of the three focus areas; Atmosphere, Environment, and Water Resource. Graduate students should consult with their advisor for a list of accepted courses in these areas.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.

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 beyond the bachelors degree or 60 credits beyond the masters degree.

The Dakota Digital Network (DDN) 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

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

Biological Sciences

Degrees Offered:

Ph.D. Biological Sciences

- Agricultural and Biosystems Engineering specialization, *see page 26*
- Animal and Range Sciences specialization, *see page 31*
- Biology specialization, *see page 39*
- Dairy Science specialization, *see page 61*
- Fisheries Science specialization, *see page 139*
- Human Nutrition and Food Science specialization, *see page 116*
- Microbiology specialization, *see page 39*
- Molecular Biology specialization, *see pages 39, 126*
- Pharmaceutical Sciences specialization, *see page 118*
- Plant Molecular Biology specialization, *see pages 39, 126*
- Plant Science specialization, *see page 126*
- Veterinary Microbiology specialization, *see page 136*
- Veterinary Pathobiology specialization, *see page 136*
- Wildlife Science specialization, *see page 139*

M.S. Biological Sciences

- Biology specialization, *see page 39*
- Dairy Science specialization, *see page 61*
- Food and Biomaterial Processing specialization, *see page 26*
- Horticultural Science specialization, *see page 95*
- Human Nutrition & Food Science specialization, *see page 116*
- Microbiology specialization, *see page 39*
- Pharmaceutical Science specialization, *see page 118*
- Veterinary Microbiology specialization, *see page 136*
- Veterinary Pathology specialization, *see page 136*

Ph.D. Coordinator: Professor John J. Ruffolo

For additional information contact:

Mailing address: SDSU Box 2201 *Phone: 605/688-6696*
Administration Building — ADM 130 *Fax: 605/688-6167*
WWW: http://www3.sdstate.edu/Academics/GraduateSchool/GraduateDegreesOffered
E-mail: John_Ruffolo@sdstate.edu

Program Description

This is a cooperative program leading to the Doctor of Philosophy degree in Biological Sciences. Departments that cooperate in the program are the Departments of Animal and Range Sciences, Agricultural and Biosystems Engineering, Animal and Range Sciences, Biology, Dairy Science, Microbiology, Molecular Biology, Pharmaceutical Sciences, Plant Science, Plant Molecular Biology, Veterinary Microbiology, Veterinary Pathobiology, 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 well in advance of 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.

Core Requirements

The Biological Sciences program has only two specific course requirements:

BioS 890 Seminar.....1
Stat 541 Statistical Methods II.....3
(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 Donald M. Marshall

For additional information contact:

Mailing address: SDSU Box 2207
Academic Programs Office
College of Agriculture and Biological Sciences
E-mail: academic.programs@abs.sdstate.edu
Phone: 605/688-5133
Fax: 605/688-5582

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.

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

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 703	Microbiology Systems	1-10 credits
ABS 705	Research Methodology	1-10 credits
ABE 554	Advanced Unit Operations in Food/Biomaterials Processing	4 credits
ABE 792	Special Topics of Food and Bioprocessing	1-3 credits
Bot 705	Aquatic Plants	3 credits
Chem 662	Principles of Biochemistry	3 credits
DS 731	Laboratory Techniques in Dairy Science	2 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	4 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 Ph.D. Seminar ..... **1 S**

BioS 898D Dissertation—Ph.D. ..... **1-7 FSSu**

Biology and Microbiology

Degrees Offered:

Ph.D. Biological Sciences
- Biology specialization
- Microbiology specialization
- Molecular Biology specialization

M.S. Biological Sciences
- Biology specialization
- Microbiology specialization

Department Head: Professor Thomas Cheesbrough
Graduate Coordinator: Assistant Professor Scott Pedersen

For additional information contact:
Mailing address: SDSU Box 2207B *Phone: 605/688-6141*
Agricultural Hall — AGH 304 *Fax: 605/688-6677*
http://www3.sdstate.edu/Academics/CollegeofAgricultureAndBiologicalSciences/BiologyandMicrobiology
E-mail: biomicro@abs.sdstate.edu

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 Graduate Degree Options and Core Requirements
See the descriptions on pages 15 (M.S.) and 18 (Ph.D.) for degree options and pages 36-38 for core requirements.

Additional Admission Requirements
GRE:General and GRE Biology are required for all applicants.
The minimum score is 50th percentile.
TOEFL: Graduate School requirement of 525

Retention in the program is dependent on formation of a committee and completion of the review matrix by the end of the first year. In ensuing years, students must have a committee meeting and complete review at least once every six months; students who do not complete this requirement will lose their assistantship and may be terminated from the program.

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

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

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

Charles D. Dieter
Associate 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

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

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

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

Alan J. Young
Assistant Professor
Ph.D., University of Toronto, 1994
Immunology

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

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

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. Crosslisted with PS 415-515. Equivalent to PS 515. Corequisite course: Bio 515L.

Bio 515L Mycology Lab 0
Equivalent to PS 515L. Corequisite course: Bio 515.

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, Zool 325.

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. Corequisite course: Bio 545L.

Bio 545L Histological Techniques Lab 0
Corequisite course: Bio 545.

Bio 553 Advanced Genetics ..... 3 F (even years)
Procedures in genetic studies as they relate to molecular and classical genetic applications. P, Bio 371. Crosslisted with PS 453-553.

Bio 562 Molecular Biology I ..... 2 F
Charge, partitioning migration of molecules; protein structure, enzymes; DNA structure and properties, procaryotic 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. Crosslisted with PS 462-562. Equivalent to PS 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 562 or consent of instructor. Crosslisted with PS 464-564. Equivalent to PS 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 562, 463-563, or consent of the instructor. Crosslisted with PS 465-565. Equivalent to PS 565.

Bio 567 Environmental Toxicology and 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. Crosslisted with Ho 480-580 and PS 480-580. Equivalent to PS 580, Ho 580.

Bio 592 Special Topics ..... 1-5 FS
Field Ecology, Human Ecology, Mammalian Developmental Genetics. Instructor's consent required.

Bio 592L Special Topics Lab 0
Instructor's consent required.

Bio 762 Eukaryotic Molecular Bio Lab 1

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. Crosslisted with PS 773. Corequisite course: Bio 773L.

Bio 773L Cytogenetics Lab 0
Corequisite course: Bio 773.

Bio 788 Biological Research Problems ..... 1-3 FSSu

Bio 791 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.

Biological Sciences (BioS) Course Offerings

BioS 790 Graduate Seminar ..... **1 FSSu**

BioS 798 Thesis ..... **1-7 FSSu**

BioS 890 Ph.D. Seminar ..... **1 FS**

BioS 898D Dissertation—Ph.D. ..... **1-7 FSSu**

Biology Teaching (BIST) Course Offerings

BIST 692 Biology Topics for Educators ..... **1-12 FSSu**
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)**
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. Corequisite course: Bot 512L.

Bot 512L Morphology of Non-Vascular Plants Lab **0**
Corequisite course: Bot 512.

Bot 513 Morphology of Vascular Plants ..... **3 S (even years)**
Corequisite course: Bot 513L.

Bot 513L 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. Corequisite course: Bot 513.

Bot 705 Aquatic Plants ..... **3 F (odd years)**
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. Corequisite course: Bot 705L.

Bot 705L Aquatic Plants Lab **0**
Corequisite course: Bot 705.

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

Bot 715L Advanced Plant Ecology Lab **0**
Corequisite course: Bot 715.

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)**
Comparative studies in in vivo and in vitro cellular differentiation, organ formation, and plant development. P, Bot 421 or Bio 371 or Bot 327. Corequisite course: Bot 781L.

Bot 781L Plant Tissue Culture Lab **0**
Corequisite course: Bot 781.

Bot 791 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 792 Special Topics ..... **1-5 FS**

Adjunct/Courtesy/Joint Faculty

Jack L. Butler
Associate Professor
Ph.D., Texas A&M University, 1986
Forest Ecology

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

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

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, Bio 153, Bio 311. Corequisite course: EnvM 525L.

EnvM 525L Disturbance Ecology Lab ..... 0 S (odd years)
Corequisite course: EnvM 525.

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 514L Anaerobic Microbiology Studio 0
Corequisite course: Micr 514.

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, 231-231L or consent. Crosslisted with PS 521. Equivalent to PS 521. Prerequisites: take 1 group (take Bio 151, Bio 152, Bio 154 /take Bot 201, Bot 202). Corequisite course: Micr 421L.

Micr 521L Soil Microbiology Lab 0
Equivalent to PS 521L. Prerequisites: take 1 group (take Bio 151, Bio 152, Bio 153, Bio 154 /take Bot 201, Bot 202). Corequisite course: Micr 421.

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. Crosslisted with Vet 524. Equivalent to Vet 524. P, Micr 422. Corequisite course: Micr 524L.

Micr 524L Medical and Veterinary Virology Lab 0
Equivalent to Vet 524L. Corequisite course: Micr 524.

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, Micr 231 (or equivalent). Corequisite course: Micr 537L.

Micr 537L Systematic Bacteriology Lab 0
Corequisite course: Micr 537.

Micro 592 Advances in Microbiology 1-4
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, Micr 231 and consent of the instructor.

Micr 592L Advances in Microbio Lab 0
Instructor's consent required. Prerequisites: take Micr 231. Corequisite course: Micr 592.

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. Corequisite course: Micr 713L.

Micr 713L Industrial Microbiology Lab 0
Corequisite course: Micr 713.

Micr 722 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 Cell Physiology of Signal Transduction ..... 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. Corequisite course: Micr 738L.

Micr 738L Microbial Metabolism Lab **0**
Corequisite course: Micr 738.

Micr 790 Graduate Seminar ..... **1 FS**

Micr 791 Microbiology Problems ..... **1-4 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 798 Thesis ..... **1-7 FSSu**

Zoology (Zool) Course Offerings

Zool 723 Systematic Physiology **4**
Corequisite course: Zool 723A.

Zool 723L Systematic Physiology Lab **0**
Corequisite course: Zool 723.

Zool 761 Taxonomy of Insects **3**
Corequisite course: Zool 761L.

Zool 761L Taxonomy of Insects Lab **1**
Corequisite course: Zool 761.

Zool 791 Special Problems ..... **1-4 FSSu**

Zool 792 Special Topics ..... **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.

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

Chemistry and Biochemistry

Degrees Offered:
Ph.D. Chemistry
M.S. Chemistry

Graduate Faculty

Jihong Cole-Dai
Assistant Professor
Ph.D., University of Maryland, 1988
Analytical/Environmental Chemistry

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

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

Matt Miller
Assistant Professor
Ph.D., Purdue University, 2001
Chemical Education

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

Department Head: Professor James A. Rice
Graduate Coordinator: Professor James A. Rice

For additional information contact:
Mailing address: SDSU Box 2202 *Phone: 605/688-5154*
Shepard Hall — SH 121 *Fax: 605/688-6364*
http://www3.sdstate.edu/Academics/CollegeOfArtsAndScience/ChemistryandBiochemistry
E-mail: James_Rice@sdstate.edu

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; powder x-ray diffractometer; 400, 300, 200, 100 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 spectrophotomete; 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

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

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 Skills ..... **2 Su**
Searching chemical literature by traditional and computer assisted methods; techniques of written and oral communication of chemical information.

Chem 622 Advanced Organic Chemistry I ..... **3 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 Chemistry ..... **3 S**
Theoretical treatment of principles involved in noninstrumental analytical chemistry including sampling and statistics. P, Chem 344.

Chem 642 Advanced Physical Chemistry ..... **3 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 Chemistry ..... **3 F**
Inorganic systems including theoretical, representative group and transition metal topics. P, Chem 344 or Chem 352.

Chem 662 Principles of Biochemistry ..... **3 F**
Chemistry of biological processes occurring in plants and animals. P, Chem 361.

Chem 691 Special Problems ..... **1-4 FS**
P, instructor's consent, limited to a total of 4 credits.

Chem 720 Special Topics in Organic Chemistry **1-6**
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 Products **3**
Synthetic strategies and pathways for the formation of natural products. P, Chem 328.

Chem 724 Structural Determination of Organic Compounds ..... **3 (alternate years)**
Determination of the structure of organic compounds primarily by spectroscopic techniques. P, Chem 328. Corequisite course: 724L.

Chem 724L Structural Determination of Organic Compounds Lab **0**
P, Chem 328. Corequisite course: Chem 724.

Chem 725 Polymer Chemistry **4**
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. Corequisite course: Chem 725L.

Chem 725L Polymer Chemistry Lab **0**
Corequisite course: Chem 725.

Chem 726 Advanced Organic Chemistry II ..... **3 (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 Chemistry **3**
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 328, Chem 662.

Chem 730 Special Topics in Analytical Chemistry **1-6**
Individualized studies in mass spectrometry, electroanalytical, trace analysis, or instrumentation and electronics, P, consent.

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
Analytical Chemistry/ Electrochemistry

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

Stanley May
Professor at University of South Dakota
Ph.D., University of Virginia, 1988
Physical Inorganic Chemistry

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

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. Corequisite course: Chem 732L.

Chem 732L Analytical Ag and Environmental Chemistry Lab....0
Corequisite course: Chem 732.

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.

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. Concurrent registration in Chem 752L.

Chem 752L Descriptive Inorganic Chemistry Lab....0
Corequisite course: Chem 752.

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 622 and 662.

Chem 766 Biochemistry II ..... **3 (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 Chemistry **3**
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 Biochemistry **3**
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 Biochemistry **3**
Study of the biochemistry of systems that are significant in nutrition including metabolism, requirements and deficiencies.

Chem 772 Seminar Preparation ..... **1 FS**
Required of all graduate majors in chemistry.

Chem 781 Bioinorganic Chemistry ..... **3 (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 Techniques ..... **4 S**
Theory and measurement of radioactivity. Techniques for the application of radioactive isotopes in chemical and biological experimentation. P, consent. Corequisite course: Chem 782L.

Chem 782L Radioisotope Techniques Lab **0**
Corequisite course: Chem 782.

Chem 790 Seminar ..... **1 FS**
Required of all graduate majors in chemistry.

Chem 798 Thesis **1-7**

Chem 898D Dissertation (Ph.D.) **1-12**

Chemistry Teaching (CHST) Course Offerings

CHST 692 Chemistry Topics for Educators ..... **1-12 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 Mechanics **2**

Phys 775 Tensors and General Relativity **3**

Phys 779 Group Theory in Quantum Mechanics **3**

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

Civil and Environmental Engineering

Degree Offered:
M.S. Engineering
• Civil Engineering emphasis

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

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 702 (Colloquium, 1 cr.) all semesters in residence.
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, CEE 216. Corequisite course: CEE 511L.

CEE 511L Bituminous Materials Lab.....0
Corequisite course: CEE 511.

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, CEE 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, CEE 423 or consent. Corequisite course: CEE 527L.

CEE 527L Environmental Engineering Instrumentation Lab.....0
Corequisite course: CEE 527.

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, CEE 446. Corequisite course: CEE 528L.

CEE 528L Solid Waste Engineering and Management Lab.....0
Corequisite course: CEE 528.

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, CEE 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, CEE 446. Corequisite course: CEE 536L.

CEE 536L Foundation Engineering Lab **0**
Corequisite course: CEE 536.

CEE 543 Matrix Analysis of Structures **3**
Theory and application of matrix methods in structural analysis. P, CEE 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, CEE 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. P, CEE 446.

CEE 552 Prestressed Concrete **3**
Theory and design of prestressed concrete including pre-tensioning and post-tensioning. P, CEE 456.

CEE 558 Design of Timber Structures **3**
Gravity and lateral loads, physical and mechanical properties of wood, properties of dimension lumber and glued laminated timber, design of beams and columns, properties of structural wood panels. Design of sheathing, diaphragms and shearwalls. Design of connections.

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, CEE 353. Corequisite course: CEE 559L.

CEE 559L Advanced Structural Mechanics Lab **0**
Corequisite course: CEE 559.

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 592 Special Topics ..... **1-3 FSSu**
P, instructor's consent required.

CEE 592L Special Topics Lab **0**
Instructor's consent required.

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. Corequisite course: CEE 632L.

CEE 632L Advanced Foundation Engineering Lab **0**
Corequisite course: CEE 632.

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.

Nadim Wehbe
Assistant Professor
Ph.D., University of Nevada, Reno, 1997
Engineering Mechanics/ Structural Engineering

Key to Course Descriptions

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

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

P = Prerequisite

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. Corequisite course: CEE 639L.

CEE 639L Geotechnical Testing Lab **0**
Corequisite course: CEE 639.

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 pedestrial analysis. P, CEE 363.

CEE 690 Seminar **1**

CEE 692 Special Topics ..... **1-3 FSSu**

CEE 702 Advanced Civil and Environmental Engineering **1-13**
Graduate study in Civil/Environmental Engineering. Registration in one or more modules requires concurrent registration in the 1-credit colloquium, which includes reports and discussions of current advanced topics related to the module content. Credit earned will depend on modules taken. Modules may include engineering analysis and design in the topic areas of civil engineering, environmental engineering, geotechnical engineering, hydraulic engineering and hydrology, structural engineering, transportation engineering and water resources engineering. Course may be repeated, but individual modules may not be repeated.

CEE 702L Advanced Civil and Environmental Engineering Lab **1**
Graduate study in Civil/Environmental Engineering. Registration in one or more modules requires concurrent registration in the 1-credit colloquium, which includes reports and discussions of current advanced topics related to the module content. Credit earned will depend on modules taken. Modules may include engineering analysis and design in the topic areas of civil engineering, environmental engineering, geotechnical engineering, hydraulic engineering and hydrology, structural engineering, transportation engineering and water resources engineering. Course may be repeated, but individual modules may not be repeated.

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. Corequisite course: CEE 722L.

CEE 722L Hazardous/Toxic Waste Disposal Lab **0**
Corequisite course: CEE 722.

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. Corequisite course: CEE 724L.

CEE 724L Land Treatment of Wastes Lab **0**
Corequisite course: CEE 724.

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. Corequisite course: CEE 725L.

CEE 725L Biological Principles of Environmental Engineering Lab **0**
Corequisite course: CEE 725.

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. Corequisite course: CEE 726L.

CEE 726L Physical/Chemical Principles in Environmental Engineering Lab **0**
Corequisite course: CEE 726.

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. Corequisite course: CEE 727L.

CEE 727L Water Treatment Plant Design Lab **0**
Corequisite course: CEE 727.

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. Corequisite course: CEE 728L.

CEE 728L Waste Water Treatment Plant Design Lab **0**
Corequisite course: CEE 728.

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 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-IIE and EPANET models. P, CEE 423, Math 321.

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.

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. Corequisite course: CEE 738L.

CEE 738L Advanced Hydraulics Lab **0**
Corequisite course: CEE 738.

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. Corequisite course: CEE 762L.

CEE 762L Pavement Management and Rehabilitation Lab **0**
Corequisite course: CEE 762.

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 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 787 Research **1-9**

CEE 788 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 Seminar **0-1**
Current, state-of-the-art, topics in civil engineering.

CEE 791 Special Engineering Problems ..... **1-3 FS**

CEE 792 Special Topics **1-3**

CEE 792L Special Topics Lab **1-3**

CEE 798 Thesis ..... **1-7 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

Communication Studies and Theatre

Degree Offered:

M.S.

- Communication Studies specialization
- Journalism specialization

(see also Journalism, page 101)

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
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

Department Head: Professor Laurie Haleta
Graduate Coordinator: Professor Laurie L. Haleta

For additional information contact:
Mailing address: SDSU Box 2218 *Phone: 605/688-6131*
Pugsley Center — PC *Fax: 605/688-6551*
WWW: http://www3.sdstate.edu/Academics/CollegeOfArtsAndScience/CommunicationStudiesandTheatre/Index.cfm
E-mail: Laurie_Haleta@sdstate.edu

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.

Areas of Specialization for Graduate Degrees
Master of Science: Option A: Communication Studies
OR
Journalism

Specializations Descriptions
Communication Studies: Designed to provide advanced studies in the areas of pubic 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.

Core Requirements
GCom 605 Current Approaches to Communication
RTVF 787 Research Methods in Communication (taken by second semester)
SPCM 700 Instructional Methods in Communications (for Graduate Teaching Assistants)

Additional Admission Requirements
GRE: Not required
TOEFL: Department requirement of 600
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.

General Communication (GCom) Course Offerings

GCom 605 Current Approaches to Communication ..... **3 S**
Major theories of communication, including media and interpersonal communication.

GCom 792 Special Topics in Communication ..... **1-3 FSSu**

Radio, Television, and Film (RTVF) Course Offerings

RTVF 537 Educational and 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. Crosslisted with MCom 437-537. Equivalent to MCom 537.

RTVF 564 Film Studies ..... **3 (alternate years)**
Film art forms, artists and critics. Viewing and making films. Emphasis on major film theories.

RTVF 787 Research Methods in Communications **3S**
Research Methods in Communication under Department of Journalism and Mass Communication.

RTVF 791 Special Problems in Radio, TV, or Film ..... **1-2 FSSu**

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. Crosslisted with Ling 452-552. Equivalent to Ling 552.

SpCm 592 Speech Education Topics **1-5**
Selected topics of current interest in the discipline.

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 791 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 798 Thesis ..... **1-7 FSSu (Pass/Fail)**

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 791 Special Problems ..... **1-2 FSSu**
Directed research; may be repeated to total of 4 credits in problems courses. P, 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

Computer Science

Degree Offered:
M.S. Engineering
• Computer Science emphasis

Graduate Faculty

Ali Salehnia
Professor
Ph.D., University of Missouri-Columbia, 1989
Information Systems

Sung Y. Shin
Professor
Ph.D., University of Wyoming, 1991
Software Engineering

Acting Department Head: Professor Ali Salehnia
Graduate Coordinator: Professor Sung Shin

For additional information contact:
Mailing address: SDSU Box 2201
Administration — ADM
WWW: http://www.engineering.sdstate.edu/~compsci/
E-mail: Ali_Salehnia@sdstate.edu
Phone: 605/688-5719
Fax: 605/688-4532

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 Intelligence.....3 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, CSc 290.

CSc 574 Computer Networks.....3 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, CSc 285.

CSc 576 Computer Graphics.....3 F
Principles of computer graphics. A study of the algorithms used to generate raster and vector graphics. P, CSc 285, Math 215 and 125.

CSc 592 Special Topics in Computer Science.....1-3
Individualized problems determined by mutual agreement between instructor and student. Programming language optional. P, instructor's consent required.

CSc 630 Principles of Data Base System Design **3**
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.

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 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 285.

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 787 Research ..... **1-9 (repeatable P/F)**
Individualized research. Repeatable P/F. Credits cannot be used on Plan of Study. P, instructor's consent required.

CSc 788 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 790 Seminar **0-1**
Current state-of-the-art topics in Computer Science. P, instructor's consent required.

CSc 791 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, instructor's consent required.

CSc 792 Special Topics in Computer Science **1-2**
Individual topics determined by mutual agreement between the instructor and the student. Programming language optional. P, instructor's consent required.

CSc 798 Thesis **1-7**

Key to Course Descriptions

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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 and Human Resource Development

Degree Offered:

M.S. Counseling and Human Resource Development

- Administration of Student Affairs Programs specialization
- Counseling in an Agency Setting specialization
- Counseling in a School Setting specialization
- Counseling in a Student Affairs Setting specialization

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

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

Marysz Rames
Dean of Students
Ed.D., University of South Dakota, 1997
Student Affairs

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

Department Head: Professor Francis Martin

For additional information contact:
Mailing address: SDSU Box 507
Wenona Hall — WEN
Phone: 605/688-4190
Fax: 605/688-5929
WWW:
http://www3.sdstate.edu/Academics/CollegeOfEducationAndCounseling/CounselingandHumanResourceDevelopment/Index.cfm
E-mail: Francis_Martin@sdstate.edu

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. All three 48-hour tracks are accredited by CACREP (Council for the Accreditation of Counseling and Related Educational Programs). An administrative track in college student personnel is also offered through CHRD. This 36-hour program meets CAS (Council for the Advancement of Standards for Student Services/Development Programs) guidelines.

Available Options for Graduate Degrees

Master of Science: Option A
Option B
Option C

See page 15 for descriptions of available options.

Core Requirements

CHRD	601	Introduction to Counseling 3
CHRD	602	Research and Evaluation in 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	785	Pre-Practicum 3
CHRD	786	Counseling Practicum 3

Additional Requirements
The following courses are required for the respective areas of specializations:

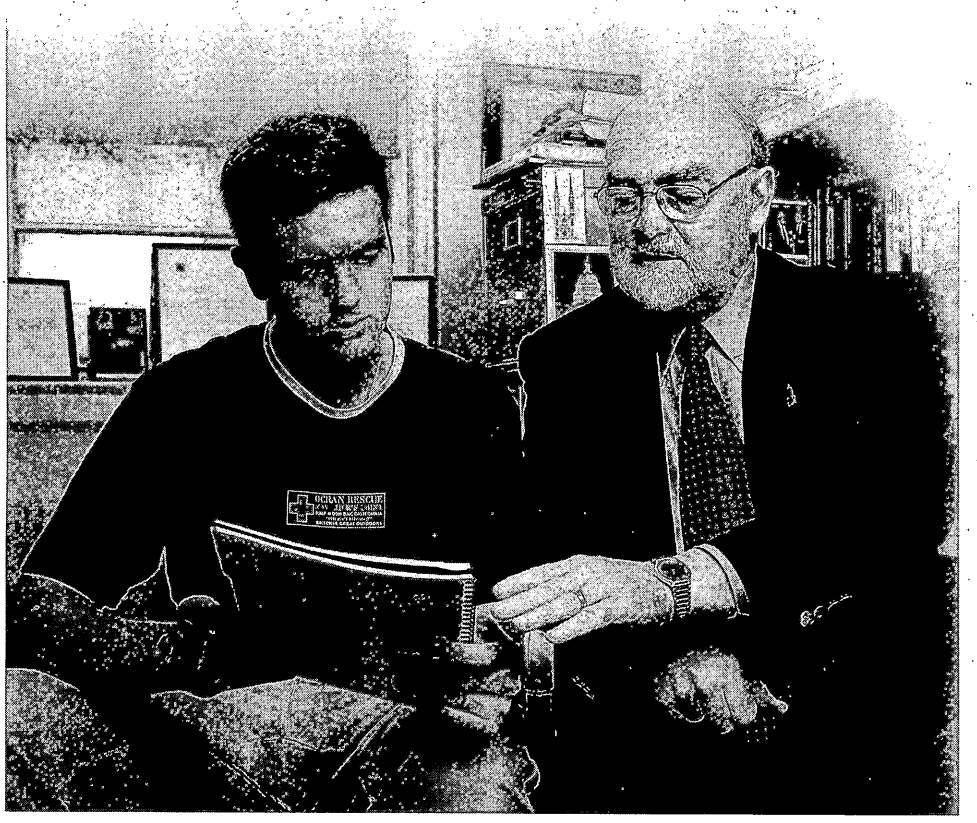
Counseling in an Agency Setting
CHRD 723 Counseling the Family 3
CHRD 755 Clinical Diagnosis & Treatment Planning 3
CHRD 794 Counseling Internship: Agency Setting 6

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 794 Counseling Internship: School Setting 6

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 794 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 advisors before registering for graduate work.



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P = Prerequisite

Requirements for 36-hour program in Student Personnel:

CHRD 601
Introduction to Counseling 3
CHRD 602
Research and Evaluation in Counseling 3
CHRD 742
Career Counseling and Planning.....3
CHRD 770
Student Development Theory and Practice 3
CHRD 771
Student Personnel Services.....3
CHRD 772
Administration and Leadership in Student Affairs.....3
CHRD 794
Internship in Student Affairs 3-6
EdFn 727
Group Processes.....3

Electives 9 hours (see advisor for suggestions)

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 students can take in CHRD before being formally accepted.

Step 2

Admission to the Counseling and Human Resource Development Department

a. Prospective students 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 ***April 1*** for Fall, and ***October 15*** for Spring. Other arrangements may be made by contacting the Department Chair.

1) A one page goal statement including ***one or more*** of the following:
   a. Aspirations related to the field of counseling;
   b. One significant life event that contributed to the development of these aspirations;
   c. The single greatest personal asset that will serve you in realizing your aspirations;
   d. 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 resume that includes all previous work experience, volunteer service, and education that you feel have 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 lieu of the Graduate School Personal Reference Form.**

b. Applicants are ***required*** to attend an orientation and group interview held approximately one month after the October and May deadlines. Students whose applications are complete by the deadline will be notified by the departmental secretary regarding 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 students have ***one calender year from the time of acceptance to begin taking courses***. Otherwise, a formal reapplication to CHRD is required.

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 602 Research and Evaluation in Counseling **3**
The course explores various research designs and methodologies applicable to the field of counseling. The course will emphasize qualitative and quantitative research, critical evaluation of research reports, the use of Internet databases for writing a research paper, a thorough understanding of APA format.

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, adolescents 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 690 Seminar ..... **1-3 FSSu**
Selected area of education including special investigation, reports, and discussion.

CHRD 692 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 693 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 700 Public School Administration **3**

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 721 School Counseling **3**
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 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 and 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.

CHRD 755 Clinical Diagnosis and Treatment Planning ..... **3 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

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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

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

diagnosed in infancy, childhood and adolescence, as well as personality disorders. P, Psyc 451 within the last five years.

CHRD 756 Counseling the Addictive Client 3
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 757 Advanced Testing: Intellectual Assessment 3
Examines the role, function, and uses of intellectual assessment instruments. Emphasis is placed on administration and interpretation of the assessment instruments.

CHRD 759 Advanced Testing: Personality Assessment 3
Examines the role, function, and use of personality assessment instruments. Emphasis will be placed on the administration and interpretation of personality assessment instruments.

CHRD 766 Group Counseling ..... 3 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, 602, 610, 661. Written permission.

CHRD 770 Student Development: Theory and Practice ..... 3 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 Services ..... 3 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. Equivalent to AHEd 772.

CHRD 785 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 786 Counseling Practicum. P, CHRD 601, 602, 610, 661.

CHRD 786 Counseling Practicum ..... 3 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 786 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, CHRD 601, 610, 661, 766, and 785, with a grade of "B" or better in 721 and 786. Instructor's consent required.

CHRD 787 Group Counseling Practicum 3
Supervised practicum in conducting small group counseling sessions. P, CHRD 766, consent.

CHRD 788 Research Problems in Counseling and Guidance ..... 2 FSSu
A problem is selected, analyzed, and reported in a 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 791 Problems ..... 1-3 FSSu
Directed reading and research in selected individual guidance and counseling topics. Instructor's consent required.

CHRD 794 Internship ..... 2-6 FSSu
Eligibility for Internship requires that students have completed CHRD 786 Counseling Practicum with the grade of "B" or better, and a substantial amount of their coursework. Ideally, all coursework 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 794 if they have reason to suspect that students' personal limitations might keep them from rendering competent services. P, consent, approval from Internship Committee, CHRD 786.

CHRD 798 Thesis ..... 1-6 FSSu
Instructor's consent required.

Dairy Science

Degrees Offered:

Ph.D. Animal Sciences

Ph.D. Biological Sciences

- Dairy Science specialization

M.S. Animal Sciences

- Nutrition specialization

M.S. Biological Sciences

- Dairy Science specialization

Acting Department Head: Professor David Schingoethe
Graduate Coordinator: Professor David Schingoethe

For additional information contact:
Mailing address: SDSU Box 2104 *Phone: 605/688-4116*
Dairy Microbiology — DM *Fax: 605/688-6276*
WWW: http://www.abs.sdstate.edu/dairysci/dairysci.htm
E-mail: David_Schingoethe@sdstate.edu

Program Description
The Dairy Science Department provides research opportunities leading to M.S. and Ph.D. degrees in both Animal Sciences 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 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.

Dairy Science (DS) Course Offerings

DS 513 Physiology of Lactation .....3 S (even years)
Anatomy, physiology, and biochemistry of mammary glands. Factors affecting quality and quantity of milk. P, Vet 223 or equivalent.

DS 552 Environmental Management Dairy Systems 2S
Discussion of environmental issues concerning dairy farms and dairy manufacturing plants with a focus on nutrient balances, by-product usage, odors, social consequences, and government policies which affect the dairy industry. P, Junior standing 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

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

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

DS 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.

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. Corequisite couse: DS 722L.

DS 722L Advanced Dairy Microbiology Lab **0**
Corequisite course: DS 722.

DS 731 Laboratory Techniques in Dairy Science ..... **3 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 791 Dairy Science Problems ..... **1-4 FSSu**
Instructor's consent required.

DS 798 Thesis ..... **1-7 (as arranged)**

DS 898D Dissertation—Ph.D. ..... **1-12 (as arranged)**

Biological Sciences (BioS) Course Offerings

BioS 890 Ph.D. Seminar ..... **1 FS**

BioS 898D Dissertation—Ph.D. ..... **1-7 FSSu**

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 300 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

- Agricultural Business emphasis
- Agricultural Economics emphasis
- Business Economics emphasis
- General Economics emphasis

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

Department Head: Professor Richard Shane
Graduate Coordinator: Associate Professor Dwight Adamson

For additional information contact:
Mailing address: SDSU Box 504 *Phone: 605/688-4141*
Scobey Hall — SCO *Fax: 605/688-6386*
WWW: http//econnet.sdstate.edu/dept/grad/program.asp
E-mail: Bill_Adamson@sdstate.edu

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 Macroeconomics	3
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 281 Introduction to Statistics.

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, Statistics 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
Professor
Ph.D., University of Illinois, 1991
Macroeconomics; Mathematical Economics

Nicole Klein
Associate 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 Lamberton
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
Associate Professor
Ph.D. Rutgers University, 1996
Macroeconomics, Money and Banking

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

John Sondey
Professor
Ph.D., Washington State University, 1989
Marketing

Evert Van der Sluis
Associate 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 Economics .....3 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 and Ranch Management .....3 (alternate years)
Leasing arrangements, capital investment, computerized accounting and budgeting. Linear programming as a tool for planning and organizing the farm business. P, senior standing, AgEc 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, AgEc 271 or Econ 201.

AgEc 630 Advanced Agricultural Marketing and Prices 3
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 691 Special Problems.....1-3 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 Thought.....3
The historical development of economic ideas. Various schools of economic thought and the economic environment which produced them. P, Econ 301, 302 or consent.

Econ 520 Economics of the Public Sector.....3
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, Econ 201 or consent.

Econ 531 Managerial Economics.....3
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, Econ 301, Math 121, Stat 281, or equivalent.

Econ 540 Economics of the International Sector.....3
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, Econ 201, 202, 330 or consent.

Econ 550 Industrial Organization.....3
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, Econ 201 and 202 or consent.

Econ 560 Economic Development.....3
Developing and developed national economies. Factors impacting economic development. Role of public policies in development. Agricultural and rural development issues emphasized. P, Econ 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, Econ 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 281, 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 370, Stat 281.

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, Stat 281.

Econ 691 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 788 Research Paper 2

Econ 792 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 798 Thesis ..... 1-7 (as arranged)

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 specialization
- Career and Technical Education specialization
  - ▲ Agricultural emphasis
  - ▲ Instructional Technology emphasis
- Elementary and Secondary specialization
  - ▲ Computer Education emphasis
  - ▲ Content Areas:
    - Biology emphasis
    - Chemistry emphasis
    - Mathematics emphasis
    - Physics emphasis
    - Others to be planned with advisor
  - ▲ English as a second language emphasis
  - ▲ Gifted Education emphasis
  - ▲ Middle School emphasis
  - ▲ Reading emphasis

M.Ed. Educational Administration

- Adult and Higher Education specialization
- Career and Technical Education specialization
- Elementary Administration specialization
- Secondary Administration specialization

Graduate Faculty

Tim Andera
Associate Professor
Ed.D., Illinois State University, 1994
Career and Technical Education

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

Michael L. Garnos
Assistant Professor
Ed.D., University of Northern Colorado, 1993
Educational Administration

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

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

Department Head: Associate Professor Kenneth S. Rasmussen
Graduate Coordinator: Associate Professor Kenneth S. Rasmussen

For additional information contact

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Wenona Hall — WEN
WWW: http://learn.sdstate.edu/edgrad
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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 591 Problems ..... **1-3 FSSu**
Directed reading and research in selected agricultural education topics.

AgEd 690 Seminar ..... **1-2 FSSu**
Selected areas of Agricultural Education including special investigation, reports, and discussion.

AgEd 706 Adult Ed in Agriculture ..... **2 Su**
Selected areas of Agricultural Education including special investigation, reports, and discussion.

AgEd 707 Supervised Occupational Experiences and Student Groups ..... **2 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 AgEd ..... **2 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. Equivalent to CTE 776.

AgEd 788 Research Problems in AgEd ..... **2 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 691 Problems ..... **1-3 FSSu**
Directed reading and research in selected individual adult and continuing education topics.

AHEd 693 Workshop - Adult and Continuing Education ..... **1-3 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 711 Assessment and Program Design ..... **3 S**
Organization and implementation of adult education programs. Particular emphasis on curriculum development, financing, staffing, marketing, and evaluation of adult programs.

AHEd 720 Principles of Postsecondary Education ..... **3 F**
Adult learning theory and instructional methods. Principles of adult curriculum design. Social and cultural factors and their effects on the learning process.

AHEd 755 Principles of College Teaching ..... **3 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 Affairs **3**
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

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

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

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

Kenneth S. Rasmussen
Assistant Professor
Ph.D., University of Nebraska, 1979
Educational Administration

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

Sharon Rae Sopko
Coordinator of Sioux Falls Programs
Ed.D., University of South Dakoa, 1996

Educational Administration with Specialization in Elementary or Secondary Education*

EDAD 700 Introduction to Educational Administration 3
EDAD 707 Principalship 2
EDAD 708 Elementary Principalship Practicum.....1
OR
EDAD 709 Secondary Principalship Practicum...1
EDAD 715 Supervision.....3
EDAD 730 School Finance....2
EDAD 735 School Law.....3
EDAD 789 Internship.....2
EDER 761 Informational Literacy.....3
EDFN 725 Education in a Pluralistic Society.....3
EDFN 730 Current Issues in Education.....3
EDFN 745 Effective Teaching: Theory into Practice.....3
EDFN 747 Curriculum: Theory and Practice.....2
SEED 748 Secondary Curriculum Practicum
OR
ELED 748 Elementary Curriculum Practicum.....1
EDFN 750 Educational Technology.....3
EDFN 782 Capstone Seminar.....1

**Meets requirements for a principalship endorsement on a South Dakota Teaching Certificate. Also requires at least four years experience as a certified tecaher a the level for which the endorsement is sought.*

experience in applying theory to the administration of Student Affairs operations. Equivalent to CHRD 772.

AHEd 788 Research Problems in Adult Ed .....2 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.

AHEd 790 Seminar .....1-3 FSSu
Study in selected areas of adult and continuing education including special investigation, reports and discussion.

AHEd 794 Internship in Education .....1-6 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.

Career and Technical Education (CTE) Course Offerings

CTE 519 Methods of Teaching.....3 FSu (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 Education.....3 FSu (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 and Practice.....3 FSu (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 Techniques.....3 FSu (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 Education.....3 FSu (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 563 Technical and Industrial Experiences 1-4

CTE 591 Special Problems.....1-4
Directed reading and research in selected individual topics.

CTE 592 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 700 Technology in Career 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 720 Entrepreneurship Career Education 3

CTE 731 Administration and Supervision of Career 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 751 Curriculum in Home Economics Education 2
Crosslisted with FCSE 751.

CTE 761 Evaluation in Home Economics 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. Crosslisted with AgEd 776.

CTE 788 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 790 Seminar.....1-3
Study in selected areas of career and technical education including special investigation, reports, and discussion.

CTE 791 Problems.....1-3
Directed reading and research in selected career and technical education topics. Written permission of Department required.

CTE 792 Special Topics.....1-3
Advanced courses taught upon demand.

CTE 794 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 798 Thesis in Career and Technical Education 5

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. Corequisite courses: EdAd 708 and 709.

EdAd 708 Elementary Principalship Practicum .....1 Su
Field-based problem-centered experience. Corequisite course: EdAd 707.

EdAd 709 Secondary Principalship Practicum .....1 Su
Field-based problem-centered experience. Corequisite course: EdAd 707.

EdAd 710 Elementary School Administration 3

EdAd 711 Secondary School Administration 3

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.

Educational Administration with Specialization in Adult and Higher Education

AHEd 710
Adult Curriculum and Instruction 3
AHEd 711
Organization and Administration of Adult and Higher Education.....3
CHRD 771
Student Personnel Services 3
EdAd 700
Introduction to School Administration.....3
EdAd 715
Supervision.....3
OR
EdAd 735
School Law.....3
HDFS 614
Adult Development Theory 3
OR
CHRD 770
Student Development Theory and Practice.....3
EdAd 789
Internship.....2-6
EdER 761
Informational Literacy.....3
EdER 711
Educational Assessment....3
EdFn 725
Education in a Pluralistic Society.....3
EdFn 727
Group Processes. 3
EdFn 782
Seminar: Capstone.....1

Educational Administration with Specialization in Career and Technical Education

CTE 525
Development of CTE Thought and Practice 3
CTE 540
Curriculum Design in CTE.....3
CTE 782
Seminar in CTE 1
EdAd 700
Introduction to School Administration 3
EdAd 715
Supervision.....3
EdER 761
Informational Literacy.....3
EdFn 725
Education in a Pluralistic Society.....3

Curriculum and Instruction with Specialization in Elementary or Secondary Education

EdER 761
Informational Literacy.....3
EdER 711
Educational Assessment....3
EdFn 730
Current Issues in Education 3
EdFn 725
Education in a Pluralistic Society.....3
EdFn 745
Effective Teaching.....3
EdFn 747
Curriculum: Theory into Practice 3
SeEd 748
Secondary Curriculum Practicum.....1
OR
EdFn 750
Educational Technology ...3
EdFn 782
Capstone Seminar.....1
ElEd 748
Elementary Curriculum Practicum.....1
EPsy 740
Advanced Educational Psychology 3

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 and 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.

EdAd 735 School Law .....3 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 788 Research Problems in Ed Administration.....2 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 790 Seminar.....1-3 FSSu
Study in selected areas of education administration including special investigation, reports, and discussion.

EdAd 791 Problems.....1-3 FSSu
Directed reading and research in selected education administration topics.

EdAd 792 Special Topics.....1-3
Advanced study covering topics not regularly taught within the regular program. Topics may include the administrator and special education in rural schools, managing change. These advanced courses would be taught upon demand and when sufficient enrollment would warrant them.

EdAd 793 Workshop .....1-3 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 794 Internship in Education.....1-6 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.

Education Evaluation and Research (EdER) Course Offerings

EdER 592 Special Topics .....1-3 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 Problems.....1-3
Directed reading and research in selected education topics.

EdER 711 Educational Assessment .....3 SSu
Examines the theory and principles of educational assessment.

EdER 761 Informational Literacy.....3 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 Inquiry .....3 FSSu
Research design and methods for education professionals. Emphasis on the implementation of research concepts for action research and program evaluation.

EdER 788 Resolving Problems in Education 2

Education Foundations (EdFn) Course Offerings

EdFn 527 Middle School: Affective Applications .....2 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 Instruction .....3 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 develop-mental/psychology course of 3 credits.

EdFn 551 Curriculum and Instruction in Gifted Education .....3 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 Language.....3
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. Crosslisted with Ling 460-560. Equivalent to Ling 560. P, Ling 203.

EdFn 561 Cultural and Psychological Perspectives in the Acquisition of English as a Second Language.....3
Addresses the social and cognitive processes involved in the acquisition of a second language including developmental influences. P, EdFn 460 or 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, EdFn 460 or 560.

EdFn 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, EdFn 460 or 560.

EdFn 592 Special Topics 1-3
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 Classroom.....2
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 Styles.....3 (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 Children .....3 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 Society .....3 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.

Curriculum and Instruction with Specialization in Adult and Higher Education

AHEd 710
Adult Curriculum and Instruction.....3
AHEd 711
Organization and Administration of Adult and Higher Education 3
AHEd 751
Principles of College Teaching 3
EdAd 789
Internship 2-6
EdER 761
Informational Literacy.....3
EdER 711
Educational Assessment ...3
EdFn 725
Education in a Pluralistic Society.....3
EdFn 727
Group Processes.....3
EdFn 782
Seminar: Capstone 1
HDFS 614
Adult Development Theory.....3

Curriculum and Instruction with Specialization in Career and Technical Education

EdER Informational Literacy.....3
EdFn 725
Education in a Pluralistic Society.....3
EPsy 740 Advanced Educational Psychology ...3
OR
CTE 525
Development of CTE Thought and Practice.....3
CTE 540
Curriculum Design in CTE.....3
CTE 530
Cooperative Education Coordination Techniques...3
CTE 782
Seminar in CTE.....1
HDFS 614
Adult Development Theory.....3

Curriculum and Instruction with Specialization in Mathematics and Science Education

EdER 761
Informational Literacy.....3
EdFn 725
Education in a Pluralistic Society.....3
SCST 601
Science in Our World.....7
SCST 602
Modeling and Mathematics.....2
SCST 782
Capstone Seminar.....2

Students are required to take 12 credits from one of the discipline course areas. This requirement will be fulfilled by taking multiple sections of: BIST 601 Biology Topics for Teachers, CHST 601 Chemistry Topics for Teachers, PHST 601 Physics Topics for Teachers, or MAST 601 Mathematics Topics for Teachers. Other masters level courses may be used for this requirement with approval from the Advisor.

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 Education.....3 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 Practice.....3 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 Practice.....2 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. Corequisite courses: ElEd 748, SeEd 748.

EdFn 750 Technology in Education.....3 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 Reading.....3
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 Problems.....3
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 Reading.....2 (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 790 Seminar.....1-3
Study in selected areas of Curriculum and Instruction which may include special investigations, student reports, student writing and discussion.

EdFn 794 Internship.....1-6
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 593 Workshop.....1-3 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 Practicum.....1 Su
Field-based problem-centered experience. Corequisite course: EdFn 747, SeEd 748.

ElEd 773 Elementary School Curriculum.....3 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 Learner ..... 3 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 or graduate student.

EPsy 550 Gifted and Talented 3
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 Creativity 3
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 Disabilities 3
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 723 Adolescent Psychology 3

EPsy 740 Advanced Ed Psychology ..... 3 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 Assessment 2
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 Assessment ..... 3 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 Techniques 2
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.

INED (Indian Education) Course Offerings

INED 511 South Dakota Indian Studies 3
Provides prospective teachers and those interested in Indian people with a basic knowledge of Indian heritage and culture. Emphasis on the Dakota Indians. Crosslisted with AIS 421. (Fulfills Teacher Education requirement.)

LFT (Lofti) Course Offerings

LOFTI 592 Special Topics 1-3

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.

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)

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

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.

Secondary Education (SeEd) Course Offerings

SeEd 592 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 593 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 672 Motivation and Discipline .....3 FSu
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 690 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 FSu
Field-based problem-centered secondary curriculum development experience. Corequisite course: EdFn 747.

Technology for Teaching and Learning (TTL) Course Offerings

TTL 500.....3
This course covers the fundamental concepts of computer and telecommunication uses in education. Extensive hands-on technology training provide the basis upon which participants reconstruct curriculum and instructional techniques to support the learning needs of student.

TTL 502 2
The followup for the TTL Academy is a learning opportunity using both WebCT and ASCD online environments. TTL 2001 participants will apply these characteristics to their Unit of Practice designed in the summer Academy. This course is designed to make teachers cognizant of the numerous strategies and tools to differentiate instruction to support the learning needs of students.

TTL 503 1
This course will address technology innovations that are demanding reforms in teaching and learning approaches. These reforms have a significant impact on technology use expectations. Participants will analyze the impact of technology on student learning specific to their teaching and learning situation. In addition, participants will reflect on their own professional development, as a result of the TTL experience, in applying the appropriate uses of technology to increase student learning and achievement.

Electrical Engineering

Degree Offered:
M.S. Engineering
• Electrical Engineering emphasis

Acting Department Head: Professor Dennis Helder
Graduate Coordinator: Professor David Galipeau

For additional information contact:
Mailing address: SDSU Box 2220
Harding Hall — HH
WWW: http://www.engineering.sdstate.edu/~eeweb/
E-mail: David_Galipeau@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 electronic materials, materials, 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 692 and EE 792 Special Topics in Electrical Engineering, and individualized instruction is available through EE 691 Special Electrical Problems.

Additional Admission Requirements
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 790	Seminar	0-1

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.

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

Madeleine Y. Andrawis
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

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

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

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

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 430, EE 415 or EE 515.

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. Corequisite course: EE 540L.

EE 540L VLSI Circuit Design Studio 1
P, EE 320, EE 345, EE 360. Corequisite course: EE 540.

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 and 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. Corequisite course: EE 560L.

EE 560L Sensor Theory and Design Lab 1
P, EE 360. Corequisite course: EE 560.

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 Fiber Optic 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 572 Fiber Optic Communications Lab 1
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. Corequisite course: EE 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 592 Special Topics in Electrical Engineering 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 electromygration, 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 and 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 691 Special Electrical Problems **1-3**
P, consent.

EE 692 Special Topics in Electrical Engineering **1-3**
P, consent.

EE 788 Engineering Research or Design Paper ..... **1-2 FSSu**

EE 790 Seminar **1**

EE 791 Research ..... **1-9 (repeatable P/F)**

EE 792 Special Topics in Electrical Engineering **1-3**

EE 798 Thesis **1-7**

Key to Course Descriptions

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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

Engineering

Degrees Offered:

Ph.D. Atmospheric, Environmental and Water Resources, *see page 35*

M.S. Engineering
- Agricultural and Biosystems Engineering emphasis, *see page 26*
- Civil and Environmental Engineering emphasis, *see page 48*
- Computer Science emphasis, *see page 54*
- Electrical Engineering emphasis, *see page 75*
- Mechanical Engineering emphasis, *see page 106*
- Physics emphasis, *see page 123*

M.S. Industrial Management, *see page 99*

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

Dean: Dr. Lewis F. Brown

For additional information contact:
Mailing address: SDSU Box 2219 *Phone: 605/688-4161*
Crothers Engineering Hall — CEH *Fax: 605/688-5878*
WWW: http://www3.sdstate.edu/Academics/CollegeOfEngineering/
E-mail: Lewis_Brown@sdstate.edu

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 Medium.....3
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 Elasticity 3
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, EM 321, Math 331 or equivalent.

EM 523 Theory of Plasticity 3
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, EM 422-522 or consent.

EM 624 Theory of Plates and Shells 3
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 Mechanics 3
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 Analysis 3
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

Course Number & Name
Credits
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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

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

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 Agriculture
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

- Literature emphasis
- Language and Rhetoric emphasis

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

For additional information contact:

Mailing address: SDSU Box 504 *Phone: 605/688-5191*
Scobey Hall — SCO 014 *Fax: 605/688-5192*
WWW: http://www3.sdstate.edu/Academics/CollegeOfArtsAndScience/English/Index.cfm
E-mail: Mary_Ryder@sdstate.edu or Kathleen_Donovan@sdstate.edu

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 coursework 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
Professor
Ph.D., University of Nebraska-Lincoln, 1985
American, Native American Literature

Kathleen Donovan
Associate Professor
Ph.D., University of Arizona, 1994
Minority and Women's Literature

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

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

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

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: (General): 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 534 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 537 English Romantic Literature ..... **3 (alternate years)**
English literature of the romantic movement (1789-1832).

Engl 538 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 and 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. Crosslisted with EdFn 563. Equivalent to EdFn 563. P, EdFn 560 or Ling 560.

Engl 583 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, Engl 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 Composition **3**
Study of the methods, theories, and history of writing instruction. A course for English GTAs and required of them.

Engl 710 Seminar in Rhetoric **3**
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 1660 ..... **3 (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 1660 ..... **3 (alternate years)**
Intensive study of a selected type, theme, author, or period of English literature since 1660.

Engl 728 Seminar in American Literature to 1900 ..... **3 (alternate years)**
Intensive study of a selected type, theme, author, or period of American literature to 1900.

Engl 729 Seminar in American Literature since 1900 ..... **3 (alternate years)**
Intensive study of a selected type, theme, author, or period of American literature since 1900.

Engl 742 Seminar in American Indian Literature ..... **3 (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 791 Independent Research and Study **1-3**
Directed independent research. May be repeated to a total of 6 credits. P, consent of instructor and graduate advisor.

Engl 792 Special Topics in Composition and Literature **1-3**
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.

Engl 798 Thesis ..... **1-7 (Pass/Fail)**

Linguistics (Ling) Course Offerings

Ling 520 The New English ..... **3 (alternate years)**
Diverse new theories and applications in English linguistics: lexicography, pragmatics, stylistics, socio-semantics, semiotics, and discourse theory.

Ling 525 The Structure of English ..... **3 (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 Language ..... **3 (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 Semantics ..... **3 (alternate years)**
Relations between symbols; human behavior in reaction to symbols including unconscious attitudes, linguistics assumptions, and the objective systematization of language. Crosslisted with SpCm 552. Equivalent to SpCm 552.

Ling 560 Applied Linguistics for Teaching English as a Second Language **3**
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 or equivalent or instructor's permission. Crosslisted with EdFn 560. Equivalent to EdFn 560.

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

Degree Offered:

M.S. Family and Consumer Sciences

- Child and Family Studies specialization, *see page 96*
- Family Financial Planning specialization, *see page 96*
- Nutrition and Food Science specialization, *see page 116*

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

Dean: Professor Laurie Stenberg Nichols

For additional information contact:

Mailing address: SDSU Box 2275A
Nursing/Family/A&S — NFA
WWW: http://fcs.sdstate.edu/GradProg.htm
E-mail: Laurie_Nichols@sdstate.edu
Phone: 605/688-6181
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 591 Special Problems **1-3**
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. P, FCS 591. Maximum 3 credits.

FCS 592 Current Topics **1-3**
For students needing additional study of a topic or experience not offered as part of a regular class.

FCS 611 History and Philosophy of Family and Consumer Sciences **2**

Family and Consumer Sciences Education (FCSE) Course Offerings

FCSE 591 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. P, FCS 591, maximum 4 credits.

FCSE 592 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**
Equivalent to CTE 751.

FCSE 791 Special Problems **1-3**

FCSE 792 Current Topics **1-3**

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

Geography

Degree Offered:

M.S. Geography

Graduate minors in Geographic Information Sciences and in Planning are offered in the Department.

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 and Geography Education

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 *Phone: 605/688-4511*
Scobey Hall — SCO 232 *Fax: 605/688-4030*
WWW: http://www3.sdstate.edu/Academics/CollegeOfArtsAndScience/Geography
E-mail: Roger_Sandness@sdstate.edu
Charles_Gritzner@sdstate.edu

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 also is 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, Computer Science, Engineering, Plant Science, Sociology, Wildlife and Fisheries, among others.

Special programs are offered for students interested in unique educational experiences. Among them are interdisciplinary minors in both Planning and Geographic Information Systems. Internships generally are available with planning districts, governmental agencies, business, and industry. A limited number of Graduate Teaching Assistantships are available within the department. Occasionally, Graduate Research Assistantships are provided.

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

Geog 515 Environmental Geography .....3 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 II .....3 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 III .....3 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 590 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 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 692 Topics in Geography Education 1-4
Studies in selected fields of geography with emphasis on elementary and secondary classroom applications. Course may be repeated for credit.

Geog 710 Evolution of Geographic Thought .....3 (every third semester)
The history and development of geography and its theories, schools of thought, and current ideas.

Geog 714 Research and Writing .....3 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 Geomorphology 3
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 Climatology .....3 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 Geography 3
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

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 788 Research Paper in Geography **1-3**
P, instructor's consent required.

Geog 790 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 791 Special Problems in Geography: (Topical) **1-4**
Selected studies in geography to meet the needs of advanced students. Instructor's consent required.

Geog 794 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. Instructor's consent required.

Geog 798 Thesis **1-7**

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 is ongoing to completed planning efforts. P, Plan 571.

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: Associate Professor Renee Oscarson

For additional information contact:
Mailing address: SDSU Box 2275A
Nursing/Family/A&S — NFA
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

AHEd 710	Adult Curriculum and Instruction	3
Bio 525	Biology of Aging	3
CHRD 571	Gerontology Issues in Counseling	3
HDFS 614	Adult Development	3
NFS 761	Nutrition of the Aged	3
OR		
AHEd 711	Organization and Administration of Adult Education	3
Gero 591	Independent Study in Gerontology	1-3
Gero 592	Current Topics in Gerontology	1-3

Gerontology (Gero) Course Offerings

Gero 591 Independent Study in Gerontology .....1-3 FSSu
Individual study for quality students. P, consent of instructor; maximum of 4 credits.

Gero 592 Current Topics in Gerontology 1-3
Selected topics of current interest and concern in gerontology.

Key to Course Descriptions

Course Number & Name
Credits
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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

Graduate School

Graduate Faculty

David Hilderbrand, Dean
Ph.D., University of Missouri, 1971

John J. Ruffolo
Associate Dean
Ph.D., University of Iowa, 1972

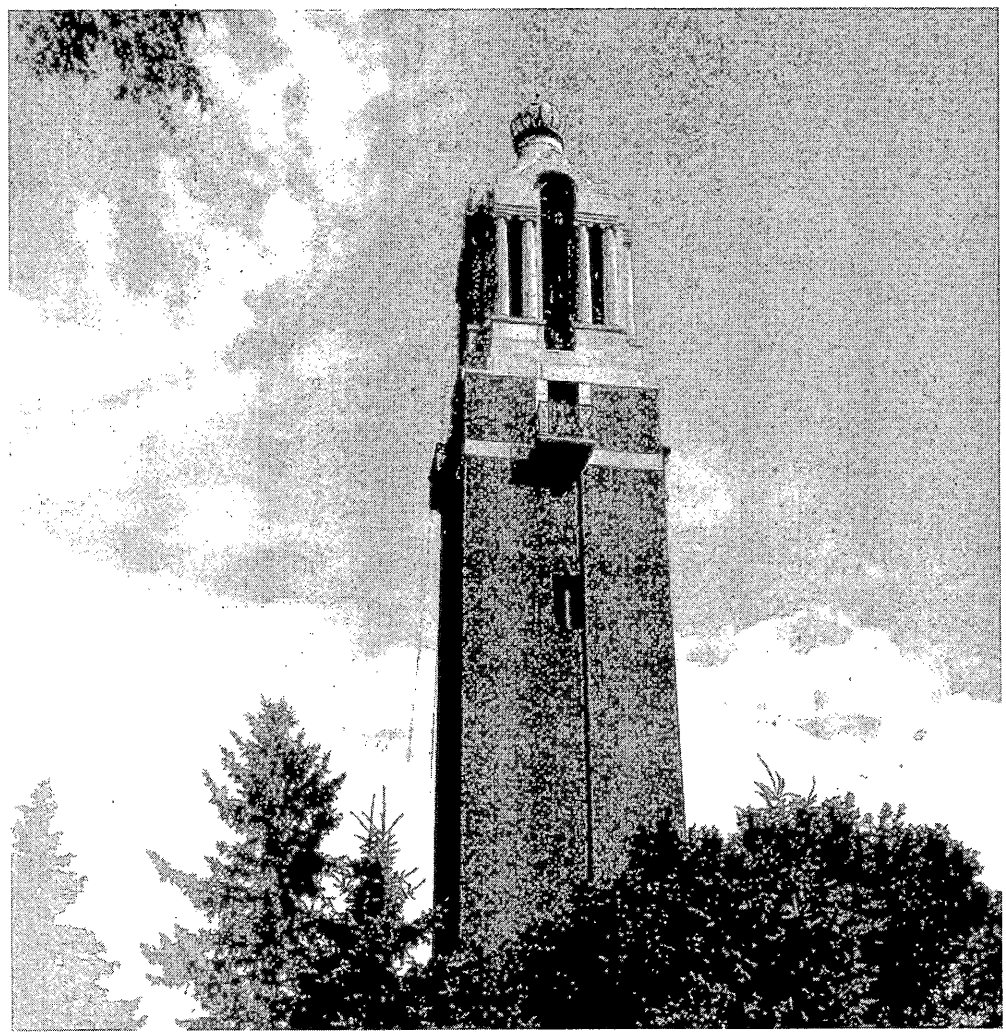
Department Head: David Hilderbrand, Ph.D.
Associate Dean: John J. Ruffolo, Ph.D.

For additional information contact:
Mailing address: SDSU Box 2201
Administration Building — ADM 130
WWW: http://www3.sdstate.edu
E-mail: david_hilderbrand@sdstate.edu

Phone: 605/688-4181
Fax: 605/688-6167

Graduate School/Research (GSR) Course Offerings

GSR 601 Research Regulations Compliance 1
The course will consist of lecture/seminars on the philosophy and practice of compliance with governmental regulations in research at South Dakota State University. The course will include completion of educational modules and associated paperwork required for the performance of research at South Dakota Sate University. The course will also serve as the foundation for South Dakota State University's education program for compliance with current and pending regulatory guidelines. Topics to be covered will include: Animal Care and Use, Human Subjects Research, Recombinant DNA, Radioactive Safety, Laboratory/Biological Safety, Integrity in Research, Conflict of Interest in Research, Financial Accountability, and Intellectual Property Issues.



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

Department Head: Fred Oien, Ed.D.
Graduate Coordinator: Matthew Vukovich, Ph.D.

For additional information contact:

Mailing address: SDSU Box 2820 *Phone: 605/688-4668*
HPER Center *Fax: 605/688-5999*
WWW: http://www.sdstate.edu/hp09/http/hper/graduate.htm
E-mail: Matthew_Vukovich@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 program provides two areas of specialization: 1) exercise physiology and 2) sport pedagogy. The exercise physiology program is designed to prepare students for competencies in areas of cardiac, pulmonary and muscle physiology, clinical exercise physiology, and strength and conditioning. Research and clinical experience are coordinated through the Applied Physiology Laboratory. The Sport Pedagogy program is designed to provide students with opportunities to prepare for careers as athletic directors or in athletic administration and associated fields of sports information/marketing, or to improve their knowledge and expertise as coaches and teachers in leadership positions. The goal of the program 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 780 Introduction to Graduate Study and Research in HPER.....1
HPER 783 Research Methods in HPER.....3

Additional Admission Requirements

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.

Graduate Faculty

James Booher
Professor
Ph.D., University of Utah, 1976
Athletic Training, Sports Medicine

Patty Hacker
Professor
Ph.D., University of Wyoming, 1988
Teacher Education, Coaching

Fred Oien
Professor
Ed.D., University of Massachusetts-Amherst, 1979
Athletic Administration

Gregory Place
Assistant Professor
Ph.D., Indiana University, 2000
Public Recreation and Administration

Matthew Vukovich
Assistant Professor
Ph.D., Ball State University, 1993
Exercise Physiology

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 (HPER) Course Offerings

HPER 593 Workshops in HPER 1-3
Lectures, conferences, and outside assignments to increase understanding of a specific area.

HPER 690 Seminar in HPER .....2 FSSu
Courses designed to address current topics or issues in the discipline.

HPER 742 Psychological Aspects of Sport and Exercise .....3 (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 and 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 Introduction of Graduate Study and Research 1

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 788 Individual Research and Study in HPER .....1-3 FSSu
Directed independent research. May be taken for up to 3 credits. P/F grading, for Plan B students. Instructor's consent required.

HPER 791 Special Problems in HPER .....1-3 FSSu
Opportunity for students to investigate specific problems or areas not covered by coursework. Written report and oral examination required. P, consent.

HPER 798 Thesis .....1-3 FSSu
Instructor's consent required.

Physical Education (PE) Course Offerings

PE 550 Clinical Exercise Physiology .....3 (alternate semesters)
This course is designed to provide the clinical exercise physiology student with assessment and prescription techniques appropriate to special populations. P, instructor's consent required.

PE 555 ECG and Clinical Stress Testing 3
This course is designed to fill the needs of students who desire the ability to interpret the normal and abnormal, resting and exercising ECG, as well as provide opportunities to learn and practice the basic components of maximal stress testing during a variety of exercise conditions. Since clinical stress testing and ECG interpretation is a vital component of the laboratory skills needed by today's exercise physiologist, emphasis in this course will be focused on understanding and interpreting ECG tracings and related pathophysiology, preparation of the exercise 12-lead ECG, and interpretation of maximal stress test results regarding exercise tolerance for various clinical populations and comparing them to normal individuals. In addition, an overview of other diagnostic procedures that involve the use of exercise will be given. P, PE 350 and PE 400.

PE 700 Exercise in Health and Disease 3
Focuses on current topics of exercise physiology, including relationships between different diseases or conditions and physical activity. Topics may change from year to year. This course will also identify and explain the mechanisms by which exercise may contribute to preventing the above diseases and in rehabilitating individuals with the above diseases. In addition, aspects of performance enhancement, rehabilitation, and/or disease prevention will be the underlying factor.

PE 730 Physical Education Teacher Education .....3 (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 Sports .....3 (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 Physiology .....3 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 Physiology ....2 (every 4th semester; alternate years)
Corequisite course: PE 751L.

PE 751L Laboratory Techniques in Exercise Physiology Lab 0
Corequisite course: PE 751.

PE 755 Applied Exercise Physiology 3
Focuses on the applied aspect of exercise physiology. Includes areas of environmental influences on performance, optimizing performance by developing and implementing training programs appropriate to the individual. In addition, training and performance characteristics of adolescent athletes and older adults as well as gender differences will be discussed. P, PE 350 and PE 750.

PE 770 Advanced Administration of Interscholastic Athletics .....2 (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 and 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.

Key to Course Descriptions

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Credits
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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

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

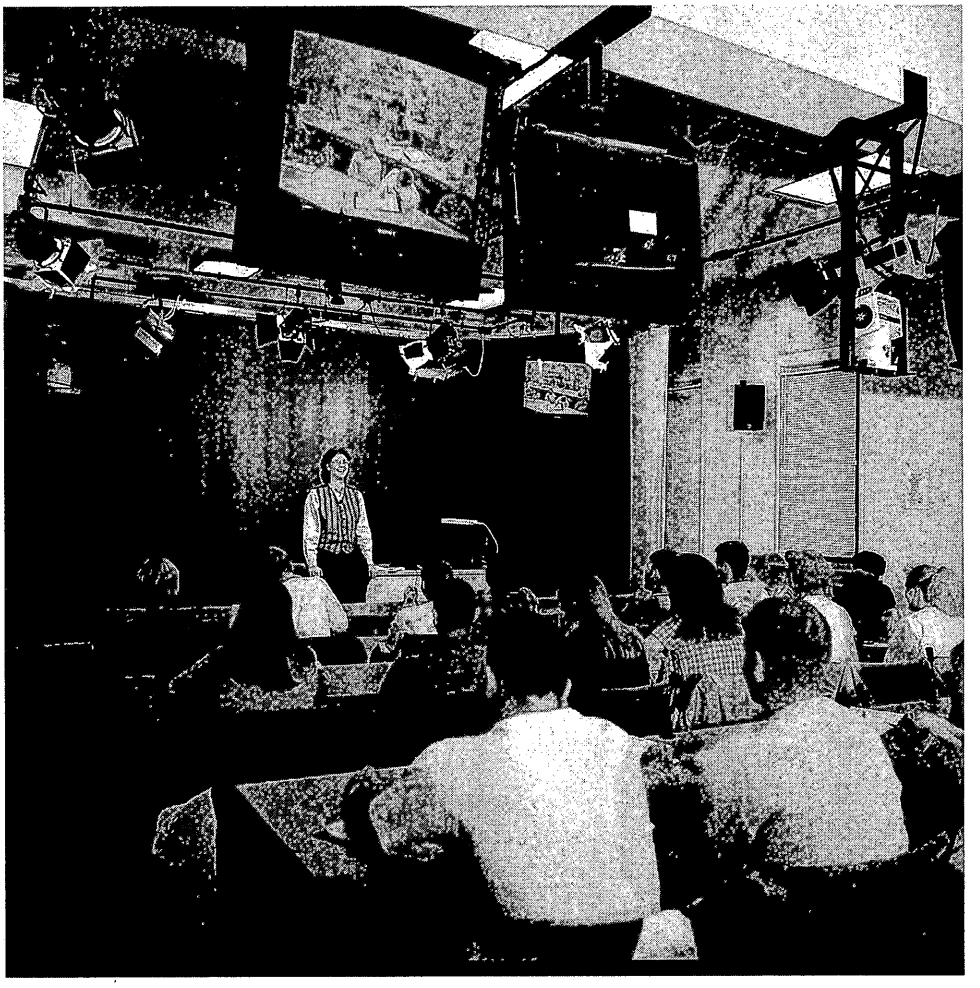
Department Head: Professor Jerry Sweeney
Graduate Coordinator: Professor Jerry Sweeney

For additional information contact:
Mailing address: SDSU Box 504
Scobey Hall — SCO 322
E-mail: Jerry_Sweeney@sdstate.edu
Phone: 605/688-4311
Fax: 605/688-5977

History (Hist) Course Offerings

Hist 591 Special Problems in History ..... **1-3 FSSu**
Selected studies for advanced students. Department consent required.

Hist 592 Topics in History **1-4**
An intensive examination of significant historical themes, issues, or problems.



Horticulture, Forestry, Landscape & Parks

Degree Offered:

M.S. Biological Sciences, *see page 36*

• Horticultural Science specialization

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/hort/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 Physiology .....3 S (even years)
Physiological and cellular response of plants to environmental stresses. P, Bot 327. Crosslisted with Bio 580 and PS 580. Equivalent to Bio 580, PS 580.

Ho 592 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. Crosslisted 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. Corequisite course: La 560L.

La 560L Landscape Ecology Lab 0
Corequisite course: La 560.

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

Leo C. Schleicher
Associate Professor of Horticulture, Forestry, Landscape and Parks
Ph.D. Purdue University, 1997
Agronomy with specialization in Turfgrass Science

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 specialization
- Family Financial Planning specialization

Graduate Faculty

Kay Cutler
Assistant Professor
Ph.D. University of Texas, 1995
Early Childhood Educaion
EC Special Education

Bernadine Enevoldsen
Professor
Ph.D., University of Minnesota, 1993
Consumer Affairs, Family Financial Planning

Scott Gardner
Professor
Ph.D., Texas Tech University, 1995
Family Studies, Marriage and Family Therapy

DeAnna Gilkerson
Professor
Ph.D., Iowa State University, 1993
Early Childhood Education

Mary Kay Helling
Professor
Ph.D., Purdue University, 1992
Early Childhood Education, Human Development

Laurie Stenberg Nichols
Professor
Ph.D., The Ohio State University, 1988
Family and Consumer Sciences Education, Family Studies

Renee Oscarson
Associate Professor
Ph.D., Purdue University
Gerontology, Family Studies, Human Development

Joseph White
Assistant Professor
Ph.D., Texas Tech University, 1997
Family Studies, Human Development

Department Head: Professor Mary Kay Helling
Graduate Coordinator: Professor Mary Kay Helling

For additional information contact:
Mailing address: SDSU Box 2275A *Phone: 605/688-6418*
Nursing/Family/A&S — NFA *Fax: 605/688-4888*
WWW: http://www3.sdstate.edu/Academics/CollegeofFamilyandConsumerSciences
E-mail: Mary_Helling@sdstate.edu

Program Description
Courses offered in Human Development, Consumer and Family Sciences support the Master of Science in Family and Consumer Sciences degree program. Two specializations are available in Child and Family Studies and Family Financial Planning. Students within the Child and Family Studies specializations 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 current resume and short (2-3 pages) essay 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 592 Current Topics 1-3
For students needing additional study of a topic or experience not offered as part of a regular class.

CA 595 Practicum Family Financial Planning 3-6
The course provides an opportunity for students in the Family Financial Planning Program to gain experience in an applied setting in their subject matter specialization. A learning plan for the applied practicum experience will be developed by the student in collaboration with the faculty member/advisor prior to the start of the practicum. Instructor's consent required.

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 791 Special Problems 1-3

CA 792 Current Topics 1-3

Early Childhood Education (ECE) Course Offerings

ECE 591 Special Problems **1-3**
Individual study for quality students. P, consent of instructor. Equivalent to HDFS 591.

ECE 592 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. Equivalent to HDFS 593, HDFS 592.

ECE 601 Orientation in Graduate Study **1**
An orientation to graduate studies in HDFS including exposure to graduate procedures and policies as well as writing skills. Required of graduate students in their first semester. Internet course. Equivalent to HDFS 601.

ECE 665 Par Education: Theory and Issues **3**
Equivalent to HDFS 665.

ECE 676 Early Childhood Educational Administration and Practicum **1-4**

ECE 700 Research Methods **4**
Equivalent to HDFS 700. Corequisite course: ECE 700L.

ECE 700L Research Methods Studio **1**
Equivalent to HDFS 700L. Corequisite course: ECE 700.

ECE 711 Child Development Theory and Application **3**
Equivalent to HDFS 711.

ECE 788 Individual Research and Study **1-7**
Equivalent to HDFS 788.

ECE 790 Seminar **1-3**
Equivalent to HDFS 790.

ECE 791 Special Problems **1-3**
Instructor's consent required. Equivalent to HDFS 791.

ECE 792 Current Topics **1-3**
Equivalent to HDFS 792.

ECE 794 Graduate Internship **1-7**
Equivalent to HDFS 794, NFSH 794.

ECE 798 Thesis **1-7**
Equivalent to HDFS 798.

Human Development, Child and Family Studies (HDFS) Course Offerings

HDFS 557 Family Assessment ..... **3 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.

HDFS 591 Special Problems ..... **1-3 FSSu**
Individual study for quality students. P, consent of instructor. Equivalent to ECE 591.

HDFS 592 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. Equivalent to ECE 592.

HDFS 601 Orientation in Graduate Study **1**
An orientation to graduate studies in HDFS including exposure to graduate procedures and policies as well as writing skills. Required of graduate students in their first semester. Internet course. Equivalent to ECE 601.

HDFS 614 Adult Development ..... **3 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.

HDFS 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. Equivalent to ECE 665.

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

HDFS 700 Research Methods **4**
Equivalent to ECE 700. Corequisite course: HDFS 700L.

HDFS 700L Research Methods Studio **0**
Equivalent to ECE 700L. Corequisite courses: HDFS 700.

HDFS 711 Child Development Theory and Application ..... **3 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. Equivalent to ECE 711.

HDFS 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.

HDFS 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.

HDFS 777 Child and Family Counseling ..... **3 Su (alternate years)**
Theory and philosophy of counseling and therapy with children and families using a family systems approach. P, instructor consent.

HDFS 788 Individual Research and Study **1-7**
Equivalent to ECE 788.

HDFS 790 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. Equivalent to ECE 790.

HDFS 791 Special Problems **1-3**
Individual study for qualified students. P, instructor's consent required. Equivalent to ECE 791.

HDFS 792 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. Equivalent to ECE 792.

HDFS 794 Graduate Internship **1-7**
Equivalent to ECE 794, NFSH 794.

HDFS 798 Thesis **1-7**
Equivalent to ECE 798.

Industrial Management

Degree Offered:
M.S. Industrial Management

Department Head: Professor Reza Maleki
Graduate Coordinator: Professor Ross Kindermann

For additional information contact:
Mailing address: SDSU Box 2220 *Phone: 605/688-6201*
Harding Hall — HH *Fax: 605/688-5880*
WWW: http://www3.sdstate.edu/academics/CollegeofEngineering/Engineering TechnologyManagement
E-mail: Ross_Kindermann@sdstate.edu

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 one of the core areas listed below. 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:

Finance

Econ 610	Financial Management	3

Management

Soc 533	Leadership and Group Organization	3
GE 569	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

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

Manufacturing

GE 525	Occupational Safety and Health Management	3
GE 510	Human Factors in Design	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

Graduate Faculty

Ross Kindermann
Professor
Ph.D. , University of Illinois, 1978
Mathematics and Statistics

Reza Maleki
Professor
Ph.D., North Dakota State University, 1989
Industrial Engineering and 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

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 510 Human Factors in Engineering and Design 3
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 525 Risk/Loss Control Management .....3 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 569 Project Management .....3 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 591 Independent Study.....1-3 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 592 Special Topics.....1-3 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 Management .....3 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 Production 3
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 620 Industrial Safety 3
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 691 Independent Study .....1-3 FS
Problems in engineering of mutual interest to graduate students and faculty. P, consent.

GE 692 Special Topics .....1-3 FS
Current topics in selected engineering areas. P, consent.

GE 788 Research Report/Design Paper.....1-2

GE 791 Independent Study 1-9

GE 792 Special Topics.....1-3

GE 798 Thesis 1-7

Journalism and Mass Communication

Degree Offered:

M.S. Communication Studies and Journalism

(see also Communication Studies and Theatre, page 52)

- Journalism specialization

Department Head: Associate Professor Mary Arnold Hemlinger
Graduate Coordinator: Professor Lyle D. Olson

For additional information contact:

Mailing address: SDSU Box 2235 *Phone: 605/688-4171*
Yeager Hall — YEH *Fax: 605/688-5034*
WWW: http://www3.sdstate.edu/Academics/CollegeOfArtsAndScience/JournalismandMassCommunication/Index.cfm
E-mail: Mary_Hemlinger@sdstate.edu
Lyle_Olson@sdstate.edu

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 specialities who wish to develop their knowledge in mass communication.

See page 15 for descriptions of available options.

Core Requirements

GCom 605 Current Approaches to Communication
MCom 787 Research Methods in Communications
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.

Graduate Faculty

Mary Arnold Hemlinger
Associate Professor
Ph.D., University of Iowa, 1994
Mass Communications

Lyle D. Olson
Professor
Ed.D., Oklahoma State University, 1988
Scholastic Press, Technical Writing, Graphics and Design

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 792 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. P, senior standing, consent.

MCom 514 Mass Communication Law ..... **3 FS**
Libel, privacy, news gathering rights, and press freedom in America.

MCom 515 Editorial Writing and 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. Crosslisted with WmSt 418.

MCom 537 Educational Radio and TV **3**
Preparation, presentation of educational and instructional materials for radio, TV, and film and classroom use. Crosslisted with RTVF 437-537. Equivalent to RTVF 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 and Management ..... **3 F**
Business practices, newspaper, magazine, and broadcast management.

MCom 693 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 762 Special Problems in Radio, TV or Film **1-2**

MCom 787 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.

MCom 791 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 798 Thesis ..... **1-7 FSSu**

Mathematics and Statistics

Degree Offered:
M.S. Mathematics

Department Head: Professor Kenneth Yocom
Graduate Coordinator: Professor Robert Lacher

For additional information contact:
Mailing address: SDSU Box 2220 *Phone: 605/688-6196*
Harding Hall — HH *Fax: 605/688-5880*
WWW:
http://www3.sdstate.edu/Academics/CollegeofEngineering/MathematicsandStatistics/
E-mail: Robert_Lacher@sdstate.edu

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 692 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.

Graduate Faculty

Ross P. Abraham
Associate Professor
Ph.D., University of Houston, 1997, Group Theory, Abstract Algebra

Kurt D. Cogswell
Associate Professor
Ph.D., Northwestern University, 1996, Dynamical Systems, Real Analysis

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

Daniel J. Schaal
Associate Professor
Ph.D., University of Idaho, 1994, Ramsey Theory, Combinatorics

Robert C. Schmidt
Professor
Ph.D., Iowa State University, 1987, Numerical Linear Algebra, Numerical Analysis

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

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

Mathematics (Math) Course Offerings

Math 523 Advanced Calculus I .....3 F (on demand)
Elementary topology of R and Rn, continuity, differentiation and integration in R and Rn, infinite series of real numbers, uniform convergence. P, Math 225.

Math 524 Advanced Calculus II .....3 S (on demand)
Power series, improper integrals, calculus of transformations from Rn to Rn, differential forms, vector analysis. P, Math 521. Corequisite course: Math 523.

Math 530 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 Introduction 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 125 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 592 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 716 Theory of Algebraic Structures I .....3 F (alternate years)
Abelian Groups, homomorphisms, permutation groups, Sylow theorems, group representations and characters. P, Math 413.

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.

Math 780 Advanced Mathematics ..... **1-18 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 Theory ..... **3 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 or Stat 381.

Math 788 Research Paper ..... **1-2 FSSu**

Math 790 Seminar ..... **1 FS (Pass/Fail)**
Current Topics in Mathematical Research. Pass/Fail grading.

Math 791 Special Problems ..... **1-3 FSSu**

Math 792 Advanced Topics ..... **1-3 FSSu**

Math 798 Thesis ..... **1-7 FSSu (Pass/Fail)**

Statistics (Stat) Course Offerings

Stat 541 Statistical Methods II ..... **3 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 281, Math 381, or Stat 381, Stat 210 or Stat 410. 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 281, Math 381 or Stat 381.

Stat 585 Theory of Statistics **3**
P, Math 381.

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 281, Math 381 or Stat 381. Crosslisted with ME 662.

Stat 751 Interpretation of Statistical Software Output ..... **2 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 curvelinear regression, and balanced and unbalanced analysis of variance. P, Stat 541 or Stat 585, Stat 210 or Stat 410 or consent of instructor.

Stat 761 Experimental Design ..... **3 S**
Experimental designs involving confounding, factorial experiments, incomplete block, lattice, incomplete latin square designs, combining experiments, and discriminant analysis. P, Stat 541 or Stat 585.

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 585.

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

Mechanical Engineering

Degree Offered:
M.S. Engineering
• Mechanical Engineering emphasis

Graduate Faculty

Kurt Bassett
Associate Professor
Ph.D., North Dakota State University, 1995
Mechanical Systems, Energy Analysis

Fereidoon Delfanian
Professor
Ph.D., North Dakota State University, 1995
Computational Fluid Dynamics, Mechanical Systems

Donell Froehlich
Professor
Ph.D., Cornell University, 1976
Industrial, Mechanical Design

H.S. Ghazi
Professor
Ph.D., The Ohio State University, 1962
Thermodynamics, Heat Transfer

Alex Moutsoglou
Professor
Ph.D., University of Missouri-Rolla, 1977
Thermofluid Energy Systems

Charles Remund
Professor
Ph.D., University of Nebraska-Lincoln, 1988
Thermofluids, Systems

Department Head: Professor Donell Froehlich
Graduate Coordinator: Professor Alex Moutsoglou

For additional information contact:
Mailing address: SDSU Box 2219
Crothers Engineering Hall — CEH
WWW: http://www.sdstate.edu/me20
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 an emphasis of M.E. concentrates on 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 Control 3
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, ME 311.

ME 527 Gas Dynamics I 3
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 Design 3
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 592 Special Topics 1-3

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 and 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. Corequisite course: ME 635L.

ME 635L Modeling and Simulation Lab 0
Corequisite course: ME 635.

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. Crosslisted 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.

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

ME 690 Seminar **0-1**

ME 691 Special Problems **1-5**
Provides an opportunity for study or investigation of special problems or project at graduate level. P, or consent.

ME 692 Special Topics **1-3**

ME 787 Research **1-9**

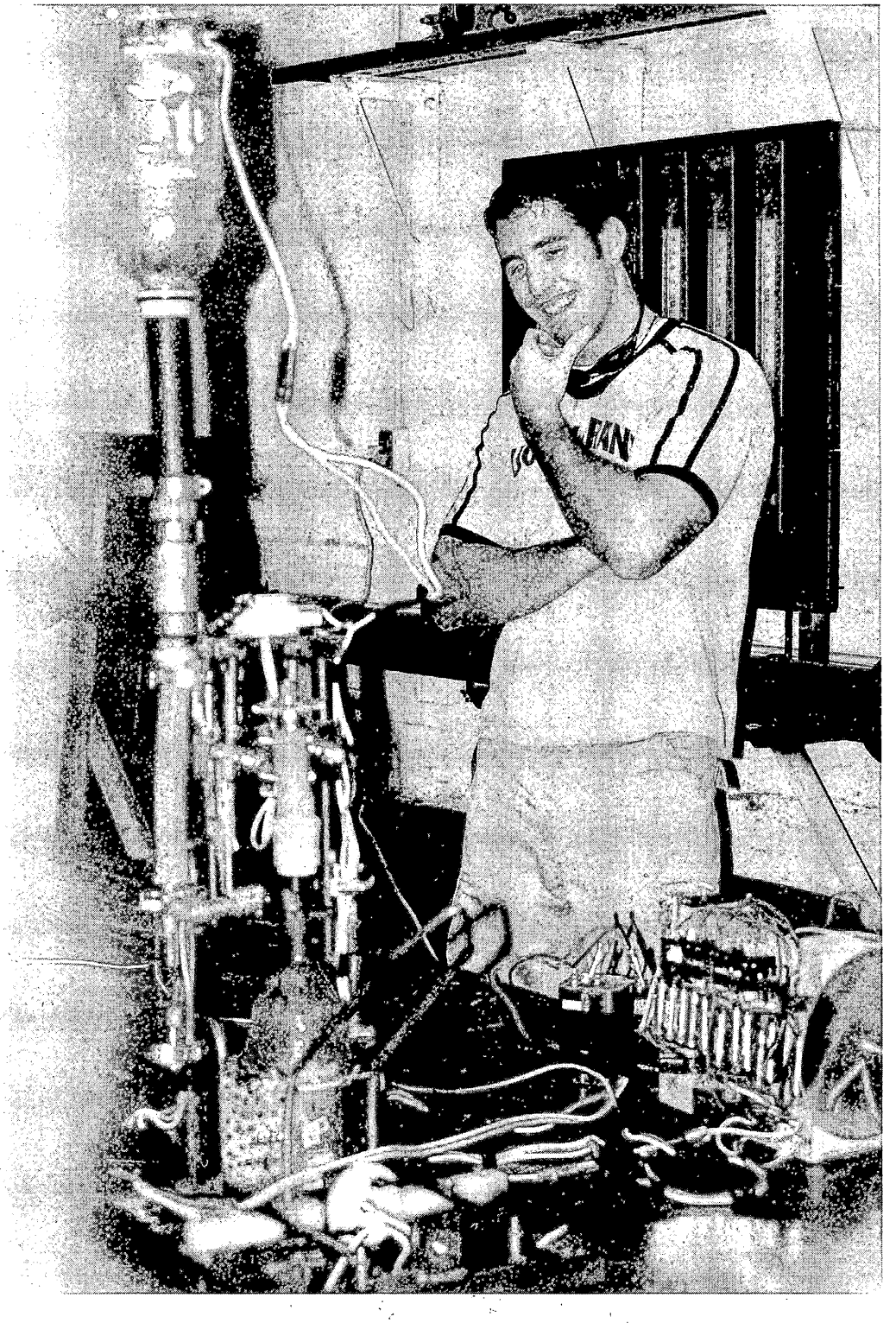
ME 788 Research or Design Paper **1-2**

ME 790 Seminar **0-1**

ME 791 Special Problems **1-3**

ME 792 Special Topics **1-3**

ME 798 Thesis **1-7**



Modern Languages

Coursework only offered

Department Head: Professor Philip Baker

For additional information contact:
Mailing address: SDSU Box 2275 *Phone: 605/688-5101*
Nursing/Family/A&S — NFA *Fax: 605/688-6699*
WWW: http://www3.sdstate.edu/academics/collegeofartsandscience/modernlanguages
E-mail: Philip_Baker@sdstate.edu

Modern Languages (ML) Course Offerings

ML 560 Topics in French, German and Spanish Literature 1-4
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 591 Special Problems 1-3

ML 592 Special Topics in Language and Culture 1-3

ML 595 Graduate Level Living and Study Abroad 1-6
Instructor's consent required.

French (Fren) Course Offerings

Fren 591 Directed Readings/Independent Study 1-3

German (Germ) Course Offerings

Germ 591 Special Problems .....1-3 FSSu (alternate years)
This course gives graduate students the opportunity to do individualized and/or independent study in German.

Spanish (Span) Course Offerings

Span 591 Special Problems 1-3
This course gives graduate students the opportunity to do individualized, and/or independent study in Spanish. Instructor's consent required.

Graduate Faculty

Philip Baker
Professor of Modern Languages
Ph.D., Florida Sate 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

Music

Minor only offered

Graduate Faculty

Corliss Johnson
Professor
D.M.A., University of Colorado-Boulder, 1972
Director of Jazz Activities, Clarinet

Department Head: Professor Corliss Johnson
Graduate Coordinator: Professor Corliss Johnson

For additional information contact:
Mailing address: SDSU Box 2212 *Phone: 605/688-5188*
Lincoln Music Center — LMH *Fax: 605/688-4307*
WWW: http://www3.sdstate.edu/academics/collegeofartsandscience/music
E-mail: Corliss_Johnson@sdstate.edu

Music (Mus) Course Offerings

Mus 591 Independent Studies **1-3**
Consent. May be used as substitute for music requirement.

Mus 592 Special Topics **1-5**

Nursing

Degree Offered:

M.S. Nursing

- Administrator specialization
- Clinical Nurse Specialist specialization
- Educator specialization
- Family Nurse Practitioner specialization
- Neonatal Nurse Practitioner specialization
- Psychiatric Nurse Practitioner specialization

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://www3.sdstate.edu/Academics/CollegeofNursing/GraduateNursing/
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 as a 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.

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 specialization.
3. Evaluate 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
Option C (pending approval) in NP specializations only
See page 15 for descriptions of available options.

Core Requirements
See sidebar on page 112 for required core courses for all students.

Additional Admission Requirements
GRE: Not required
TOEFL: Department requirement of 560
In addition to meeting basic requirements for admission to the Graduate School, applicants for graduate study in nursing must have:

1. 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).
2. Current licensure as an RN or eligibility for licensure.
3. Professional nursing liability insurance.

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
Professor
Ph.D., University of Arizona, 1990

Howard E. Wey
Associate Professor
Ph.D., University of Cincinnati College of Medicine, 1980

4. 1500 hours of nursing practice experience.
5. An approved course in statistics.
6. An additional application to the Graduate 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.

Total enrollment in the Master of Science in Nursing program may vary depending upon available clinical facilities and qualified faculty. Applicants are selected competitively from those qualified for the master's program. Applicants should check with the Graduate Nursing office for application deadlines.

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

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

Electives

Nurs 625 Human Sexuality in Health Care
Nurs 635 Dying, Death & Bereavement
Nurs 640 Legal and Ethical Accountability in Health Care
Nurs 645 Management of Acute and Chronic Pain
Nurs 655 Health and the Older Adult
Nurs 691 Special Problems
Nurs 692 Special Topics
Nurs 725 Patient Care Management
Nurs 790 Seminar in Advanced Nursing
Nurs 785 Self Care of the Older Adult

Post Master's Certificates

Family Nurse Practitioner

Nurs 631 Advanced Physical Assessment	3
Nurs 765 Interventions in Complex Health Problems	3
Nurs 771 Family Nurse Practitioner - Primary Care	6
Nurs 776 Family Nurse Practitioner - Small Group	3
Nurs 777 Family Nurse Practitioner - Practicum	9
Pha 645 Pharmacotherapeutics	4

Nurse Educator

AHEd 751 Principles of College Teaching	3
Nurs 631 Advanced Physical Assessment	3
Nurs 710 Curriculum Developmeng in Nursing	2
Nurs 778 Nurse Educator - Practicum	6

Nurse Educator

AHEd 751 Principles of College of Teaching	3
Nurs 710 Curriculum Development in Nursing	2
Nurs 778 Nurse Educator - Practicum	6

Family Nurse Practitioner

Nurs 631 Advanced Physical Assessment	3
Nurs 765 FNP Practicum I	5
Nurs 771 FNP Practicum II	7
Nurs 776 FNP Seminar	3
Nurs 777 FNP Internship	9
Pha 645 Pharmacotherapeutics	4

Health Science (HSc) Course Offerings

HSc 533 Industrial Health ..... 3 (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 Nurse Practice: Introduction to Roles and Issues 3
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 Nursing 4
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 Pathophysiology **4**
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 Care **3**
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 Research Methods for Advanced Practice Nursing **3**
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 the Neonate **3**
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. Corequisite course: Nurs 630L.

Nurs 630L Advanced Assessment of the Neonate Clinical Lab **0**
Corequisite course: Nurs 630.

Nurs 631 Advanced Assessment – Lifespan ..... **3 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. Corequisite course: Nurs 631L.

Nurs 631L Advanced Assessment – Lifespan Clinical Lab **0**
Corequisite course: Nurs 631.

Nurs 635 Dying, Death, and Bereavement **3**
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.

Nurs 640 Legal and Ethical Accountability in Health Care **2**
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 Pain **3**
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 Adult **2**
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 Ethics **3**
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 Nursing **1-4**
Investigation of a selected problem in nursing theory or practice. May be repeated for two semesters for variable credit.

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)

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

Nurs 691 Special Problems .....1-3 (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 691 can be applied to a degree. Instructor's consent required.

Nurs 691L Special Problems Clinical.....0
Instructor's consent required.

Nurs 692 Special Topics 1-3
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 Nursing 2
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 Management 3
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 Promotion and Disease Prevention: Counseling Individual/Family 4
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 623, Nurs 631. Corequisite course: Nurs 760L.

Nurs 760L Health Promotion and Disease Prevention: Counseling Individual/Family Lab 0
P, Nurs 610. Corequisite course: Nurs 760.

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 623, Nurs 631.

Nurs 770 Clinical Nurse Specialist Practicum 6
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. Corequisite course: Nurs 770L.

Nurs 770L Clinical Nurse Specialist-Practicum Clinical Lab 0
Corequisite course: Nurs 770.

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 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. Corequisite course: Nurs 772L.

Nurs 772L Neonatal Nurse Practitioner: Practicum I Clinical Lab 0
Corequisite course: Nurs 772.

Nurs 774 Nurse Administrator: Practicum **6**
Provides the opportunity to integrate principles and theories from support courses in health service administration and nursing courses to the administration of a nursing department or agency. Emphasis is placed on advanced nursing practice needed to administer the work of nursing. This is a supervised administrative practicum focused on broad participation in the administrative process in a health care organization. Corequisite course: Nurs 774L.

Nurs 774L Nurse Administrator: Practicum Clinical Lab **0**
Corequisite course: Nurs 774.

Nurs 776 Family Nurse Practitioner III: Small Group Instruction **3**
Emphasis is placed on the concept synthesis and outcome evaluation of the differential diagnoses and referral to multidisciplinary healthcare team members are emphasized in the development of appropriate interventions for the achievement and maintenance of optimal health. Transition from the student nurse practitioner role to professional practice is facilitated. P, Nurs 771. Corequisite course: Nurs 777.

Nurs 777 Family Nurse Practitioner III: Internship **1-9**
The clinical internship 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 settings 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 environment context. P, Nurs 771. Corequisite course: Nurs 776.

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. Corequisite course: Nurs 778L.

Nurs 778L Nurse Educator: Practicum Clinical Lab **0**
Corequisite course: Nurs 778.

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. Corequisite course: Nurs 779L.

Nurs 779L Neonatal Nurse Practitioner: Practicum II Clinical Lab **0**
Corequisite course: Nurs 779.

Nurs 785 Self Care: The Older Adult **3**
Analysis from a nursing perspective of various factors which alter the self-care of the older adult. P, consent of instructor.

Nurs 788 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 626, regular admission status. Requires five additional credits of electives.

Nurs 790 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 798 Thesis in Nursing **1-7**
P, Nurs 610, Nurs 692.

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

Nutrition, Food Science and Hospitality

Degrees Offered

Ph.D. Biological Sciences
- Human Nutrition and Food Science specialization

M.S. Family and Consumer Sciences
- Nutrition and Food Science specialization

M.S. Biological Sciences
- Human Nutrition and Food Science specialization

Graduate Faculty

Helen Chipman
Associate Professor
Ph.D., Colorado State University, 1992
Food Science and Human Nutrition

Georgia W. Crews
Assistant Professor
Ph.D., Kansas State University, 2000
Human Nutrition

Michael G. Crews
Professor
Ph.D., Virginia Polytechnical Institute and State University, 1978
Nutrition

Kendra K. Kattelmann
Associate Professor
Ph.D., University of Missouri, 1993
Nutrition

Padmanaban G. Krishnan
Professor
Ph.D., North Dakota State University, 1989
Food Science

Bonny L. Specker
Professor
Ph.D., University of Cincinnati, 1983
Epidemiology

Chunyang Wang
Associate Professor
Ph.D., Iowa State University, 1993
Food Science

Department Head: Associate Professor C.Y. Wang
Graduate Coordinator: Associate Professor C.Y. Wang

For additional information contact
Mailing address: SDSU Box 2275A
Nursing/Family/A&S — NFA
WWW: http//fcs.sdstate.edu/nfsh/nfsh_grad_program.htm
E-mail: Cy_Wang@sdstate.edu
Phone: 605/688-5161
Fax: 605/688-5603

Program Description
Courses offered in Nutrition and Food Science support the M.S. degree in Family and Consumer Sciences, and M.S. degree in Biological Sciences, and Ph.D. degree in Biological Sciences.

Additional Admission Requirements
GRE: Not required
TOEFL: Department Requirements of 525
Refer to the following for specific details in each program.
(1) M.S. in Family and Consumer Sciences, page 84
(2) M.S. in Biological Sciences, page 36
(3) Ph.D. in Biological Sciences, page 36

General Requirements begin on page 13 for Master's degrees and page 18 for Doctor of Philosophy degrees.

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. Corequisite course: NFSH 550L.

NFSH 550L Food Analysis Lab .....0 S (even years)
Corequisite course: NFSH 550.

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 or consent, Micr 311. Corequisite course: NFSH 551L.

NFSH 551L Advanced Food Processing Lab 0
Corequisite course: NFSH 551.

NFSH 580 Travel Studies 1-5
This travel-study course is designed to provide extra-mural educational experiences, as approved by and under the direction of a faculty member, and may be in cooperation with faculty and administrators at

other institutions. Students will participate in hands-on activities and design educational activities for presentation at selected locations. Includes pre-travel orientation, post-travel self-evaluation, and a written report.

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 591 Special Problems 1-3
Special study in food and nutrition. P, instructor's consent required.

NFSH 592 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 601 Orientation in Graduate Study 1
An orientation to graduate studies in NFSH including exposure to graduate procedures and policies as well as writing skills. Required of graduate students in their first semester. Internet course.

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. Corequisite course: NFSH 634L.

NFSH 634L Techniques in Food and Nutrition Research Lab.....0 F (even years)
Corequisite course: NFSH 634.

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, NFSH 221 or NFSH 321.

NFSH 700 Research Methods 4
Corequisite courses: HDFS 700L.

NFSH 700L Research Methods Studio 0
Corequisite courses: HDFS 700.

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, NFSH 321.

NFSH 788 Individual Research and Study 1-7

NFSH 791 Special Problems 1-3
Special studies in Nutrition and Food Science. Instructor's consent.

NFSH 792 Current Topics 1-3
Special course offerings on current issues in the fields of Nutrition and Food Science. Consent.

NFSH 794 Graduate Internship 1-7
Equivalent to ECE 794, HDFS 794.

NFSH 798 Thesis.....1-7

Key to Course Descriptions

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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

Pharmacy

Degree Offered
- Doctor of Pharmacy
- Ph.D. Biological Sciences
  - • Pharmaceutical Sciences
- M.S. Biological Sciences
  - • Pharmaceutical Sciences

Graduate Faculty

James Clem
Associate Professor
Pharm.D., University of Iowa, 1991
Cardiology

Bruce L. Currie
Professor
Ph.D., University of Utah, 1970
Medicinal Chemistry

Chandradhar Dwivedi
Professor
Ph.D., Lucknow University, 1972
Pharmacology

Debra K. Farver
Professor
Pharm.D., University of Nebraska, 1983
Psychiatry

Xiangming Guan
Associate Professor
Ph.D., University of Kansas, 1991
Medicinal Chemistry

Dennis Hedge
Associate Professor
Pharm.D., University of Kansas, 1991
Infectious Disease

Jodi Heins
Associate Professor
Pharm.D., University of Nebraska, 1993
Internal Medicine

Joel Houglum
Professor
Ph.D., University of Wisconsin-Madison, 1979
Analytical Methods

Dean: Professor Danny L. Lattin
Pharmaceutical Sciences Department Head: Professor Bruce L. Currie
Clinical Pharmacy Department Head: Professor Brian Kaatz
Graduate Coordinator: Professor Bruce L. Currie

For additional information contact

Mailing address: SDSU Box 2202C *Phone: 605/688-6197*
Pharmacy — PHA *Fax: 605/688-6232*
WWW: http://www3.sdstate.edu/Academics/CollegeOfPharmacy/
E-mail: College_Pharmacy@sdstate.edu

Doctor of Pharmacy

Six-Year Program: The Professional Degree in Pharmacy. Students interested in this program should consult the General Bulletin (undergraduate catalog) for information.

Master of Science in Biological Sciences

See Department of Pharmaceutical Sciences
Mailing address: SDSU Box 2202C *Phone: 605/688-5598*
Pharmacy — PHA *Fax: 605/688-5993*
WWW: http://www3.sdstate.edu/Academics/CollegeOfPharmacy/
E-mail: Pharm_Sci@sdstate.edu

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 and Doctor of Philosophy in Biological Sciences degree. Graduates are well prepared to work in the pharmaceutical industry, government and research laboratories.

Available Options for Graduate Degrees

Master of Science Option A
See page 15 for description of Option A.

Doctor of Philosophy Core Requirements

1. Pha 720 Advanced Medicinal Chemistry, Pha 740 Advanced Pharmacology, Pha 759 Advanced Pharmaceutics
2. BioS 790 Seminar, two credits
3. BioS 798 Thesis, 5-7 credits
4. Six credits must be taken from the following list of courses
   - ABE 503 .....Energy and Environment
   - ABE 554.....Advanced Unit Operations in Food/Biomaterials Processing
   - ABS 705 .....Research Methodology
   - ABS 706.....Natural Resources Management
   - Chem 662.....Principles of Biochemistry

DS 722.....Advanced Dairy Microbiology
Ho 580.....Environmental Stress Physiology
NFSH 725.....Nutrition and Human Performance
Stat 541.....Statistical Methods II
Vet 524.....Medical 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 550

Pharmacy (Pha) Course Offerings

Pha 645 Pharmacotherapeutics: Applicaiton to Advanced Practice 4
Current drug therapy principles with emphasis on drugs and pharmacotherapeutics used in Family Nurse Practitioner practice. P, FNP program enrollment.

Pha 646 Neonatal Pharmacotherapeutics 2
Principles of pharmacology 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.

Pha 700 Directed Studies Clerkship 4
Instructor's consent required.

Pha 701 Home Health Hospice Clerkship 4

Pha 702 Indian Health Services Clerkship 4

Pha 703 Pharmacy Administration Clerkship 4

Pha 704 Nutrition Clerkship 4

Pha 705 Clinical Research Clerkship 4

Pha 706 Critical Care Clerkship 4

Pha 707 Infectious Disease Clerkship 4

Pha 708 Surgery Clerkship 4

Pha 709 Nephrology Clerkship 4

Pha 710 Pharmacokinetics Clerkship 4

Pha 711 Oncology Clerkship 4

Pha 712 Nuclear Pharmacy Clerkship 4

Pha 713 Managed Care Clerkship 4

Pha 714 Community Pharmacy 6
Clerkship experience at an affiliated site. P, 6th year standing.

Pha 716 Institutional Pharmacy 6
Clerkship experience at an affiliated site. P, 6th year standing.

Pha 717 Communication Pharmaceutical Care Clerkship 4
Clerkship experience in pharmaceutical care in a community pharmacy.

Pha 718 Advanced Clinical Lab Monitoring 3
Study of clinical laboratory methods and tests with emphasis on drug monitoring and problem solving of drug therapy. Corequisite course: Pha 718L.

Pha 718L Advanced Clinical Lab Monitoring Lab 0
Corequisite course: Pha 718.

Pha 719 Physical Assessment Lab 1
Development and application of skills useful for pharmacists in the assessment of humans in health and disease. P, 5th year standing.

Pha 720 Advanced Medicinal Chemistry 3
Qualitative and quantitative aspects of the design of therapeutic agents. P, Pha 341 or consent.

Tom Johnson
Assistant Professor
Pharm.D., North Dakota State University, 1997
Critical Care

Brian Kaatz
Professor
Pharm.D., Univeristy of Minnesota, 1977
Clinical Pharmacy

Danny Lattin
Professor
Ph.D., University of Minnesota, 1970
Medicinal Chemistry

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

Susam Mukherjee
Assistant Professor
Ph.D., University of Southern California, 1997
Pharmaceutics

Yahdhu Singh
Professor
Ph.D., University of Strathclyde, 1979
Pharmacology

Manisha Sonee
Assistant Professor
Ph.D., University of Southern California, 1999
Pharmaceutics

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
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P = Prerequisite

Pha 722 Therapeutics - The Geriatric Patient 2
Physiological and psychological aspects of aging with special attention to altered drug requirements. P, 5th year standing.

Pha 723 Ethics in Healthcare Practice 2
Overview of ethical principles and theory, with emphasis on the professional-client relationship. P, 5th year standing.

Pha 724 Pharmacoeconomics 2
The pharmacoeconomic principles used to evaluate medications, with emphasis on the use of therapeutic outcomes to compare cost effectiveness of therapeutic agents. P, 5th year standing.

Pha 725 Topics in Medicinal Chemistry 3
Selected areas covering more advanced concepts in medicinal chemistry, new research techniques. P, Pha 341 or consent.

Pha 727 U.S. Health Care Systems 2
An overview of the health care system in the United States and its impact on pharmacy practice will be addressed. Emphasis will be placed on managed care, non-pharmacist health care providers, pharmacoeconomics, drug utilization, and quality assurance and improvement. P, 5th year standing.

Pha 728 Current Issues in Pharmacy Practice 3
Theory and development of pharmaceutical care concepts. Discusses role of a contemporary pharmacy practitioner within the framework of the U.S. health delivery system. Pharmacy ethics is discussed. P, 5th year standing.

Pha 729 Pharmaceutical Marketing 2
Discussion of the marketing functions of the pharmaceutical manufacturer, the wholesaler, and the pharmacy practitioner. P, 5th year standing.

Pha 730 Advanced Pharmacotherapeutics I 6
Organ-based approach to the use of patient-specific factors for drug therapy in individualized patient situations. Integrates pathophysiology and drug therapy principles. Corequisite course: Pha 730L.

Pha 730L Advanced Pharmacotherapeutic I Lab 0
Corequisite course: Pha 730.

Pha 731 Advanced Pharmacotherapeutics II 6
Continuation of 730. P, Pha 730. Corequisite course: Pha 731L.

Pha 731L Advanced Pharmacotheraputic II Lab 0
Corequisite course: Pha 731.

Pha 732 Therapeutics - Renal/Fluids and Electrolytes 3
Discussion of drug therapy principles for the development of patient specific drug regimens in the areas of renal and fluid and electrolytes. P, 5th year standing.

Pha 733 Therapeutics - Gastroinestinal and Nutrition 3
Discussion of drug therapy principles for the development of patient specific drug regimens in the areas of gastrointestinal disease and nutrition. P, 5th year standing.

Pha 734 Therapeutics - Endocrine/Reproduction 2
Discussion of drug therapy principles for the development of patient specific drug regimens in the area of endocrine and reproductive medicine. P, 5th year standing.

Pha 735 Therapeutics - Infectious Disease 3
Discussion of drug therapy principles for the development of patient specific drug regimens in the area of infectious disease principles. P, 5th year standing.

Pha 736 Therapeutics - Neurology/Psychiatry 3
Discussion of drug therapy principles for the development of patient specific drug regiment in the areas of neurology and psychiatric medicine. P, 5th year standing.

Pha 737 Therapeutics - Cardiopulmonary 4
Discussion of drug therapy principles for the development of patient specific drug regimens in the area of cardiopulmonary disease. P, 5th year standing.

Pha 738 Therapeutics - Hematology/Oncology 2
Discussion of drug therapy principles for the development of patient specific drug regimen in the areas of hematology and oncology. P, 5th year standing.

Pha 739 Therapeutics - Rheumatology/Skin/Skeletal 2
Discussion of drug therapy principles for the development of patient specific drug regimen in the areas of rheumatology, dermatology, and skeletal diseases. P, 5th year standing.

Pha 740 Advanced Pharmacology 3
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 743 Pharmacy Care in the Community 2
Development of the concept of pharmacy care, with emphasis on the pharmacist's role in patient care. Includes discussion of over-the-counter medications.

Pha 745 Topics in Pharmacology 3
A study of current advanced theories in pharmacology. P, Pha 443 or consent.

Pha 750 Critical Care Therapeutics 2
Principles of medication use in the critically ill patient. P, 5th year standing.

Pha 751 Immunotherapeutics 2
Therapeutic use and pharmacology of newer immunologic agents, engineered drugs, and biotechnological products. P, 5th year standing.

Pha 752 Drugs of Abuse and Addiction 2
Discussion of psychoactive drugs, both legal and illegal, that have potential for abuse. P, 5th year standing.

Pha 753 Women and Children's Health 2
Diseases and drug-related issues pertaining to women's and children's health. P, 5th year standing.

Pha 754 Complementary and Alternative Medicine 2
Discussion of alternative, natural, and homeopathic medicines, with emphasis on their appropriate evaluation and use.

Pha 755 Research Design and Drug Information 4
Advanced study in critical assessment of the medical literature with emphasis on the elements of scientific research. Studies components of viable research proposals and includes independent work to develop a proposal. Corequisite course: Pha 755L.

Pha 755L Research Design and Drug Information Lab 0
Corequisite course: Pha 755.

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 760 Clinical Pharmacokinetics 3
Advanced pharmacokinetic principles, with emphasis on drug dosing on individual patient basis.

Pha 765 Topics in Pharmaceutics 3
Selected areas covering more advanced concepts in pharmaceutics, new research techniques. P, Pha 415 or consent.

Pha 770 Pediatrics Clerkship 4

Pha 771 Geriatrics Clerkship 4

Pha 772 Internal Medicine I Clerkship 4

Pha 773 Internal Medicine II Clerkship 4

Pha 774 Ambulatory Care Clerkship 4

Pha 775 Psychiatry Clerkship 4

Pha 784 Seminar I 1
Discussion of current pharmacy and other health care issues and includes developing and delivering a short presentation. P, 5th year standing.

Pha 785 Seminar II 1
Continuation of 784, with emphasis on discussion of clinical pharmacy concepts and professional presentations. P, Pha 784.

Pha 790 Seminar 1
Contemporary topics in the pharmaceutical sciences. Required of all graduate students in pharmaceutical sciences. Maximum of two credits.

Pha 791 Directed Studies 1-3
In-depth study in a subject area compatible with the student's interests. Instructor's consent required.

Pha 792 Special Topics in Pharmacy 1-3
Instructor's consent required.

Pha 798 Thesis in Pharmaceutical Sciences 1-7

Master of Science in Pharmaceutical Sciences: *Inactive Status*

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(Lecture Hours, Lab Hours)

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

P = Prerequisite

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

Department Head: Distinguished Professor Robert V. Burns

For additional information contact:
Mailing address: SDSU Box 504
Scobey Hall — SCO
E-mail: Robert_Burns@sdstate.edu
Phone: 605/688-4322
Fax: 605/688-6754

Philosophy (Phil) Course Offerings

Phil 591 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 591 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. Instructor's consent required.

Physics

Degree Offered:
M.S. Engineering
• Physics emphasis

Department Head: Professor Oren Quist
Graduate Coordinator: Professor Oren Quist

For additional information contact:
Mailing address: SDSU Box 2219 *Phone: 605/688-5428*
Crothers Engineering Hall — CEH 314 *Fax: 605/688-5878*
WWW: http://www.engineering.sdstate.edu/~physics/physics.htm
E-mail: Oren_Quist@sdstate.edu

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 125, PHST 692) 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

Key to Course Descriptions

Course Number & Name
Credits
F = Fall
S = Spring
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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

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 590 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 691 Special Problems .....1-3 FSSu

Phys 692 Special Topics 1-3

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 and General Relativity 3
Covariance in physics, basic tensor algebra and calculus, affine connections, the Riemann tensor, field equations, linear approximations. The Schwarzchild 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. Phys 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 Phys 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 Phys 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 787 Research **1-9**

Phys 788 Research or Design Paper **2**

Phys 790 Seminar **0-1**

Phys 791 Special Problems **1-3**

Phys 792 Special Topics **1-3**

Phys 798 Thesis **1-7**

Physics Teaching (PHST) Course Offerings

PHST 692 Physics Topics for Educators **1-12**

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

Ph.D. Biological Sciences

- Plant Molecular Biology specialization
- Plant Science specialization

M.S. Plant Science

- Agroecology specialization
- Agronomy specialization
- Crop Science specialization
- Entomology specialization
- Horticultural Crop Management specialization
- Machinery Systems and Water Management specialization
- Plant Pathology specialization
- Soil Science specialization
- Weed Science specialization

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

Michael Catangui
Assistant Professor
Ph.D., Univeristy of Nebraska, 1992
Entomology - Extension

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
Professor
Ph.D., University of Minnesota-Minneapolis/St. Paul, 1988
Soil Biochemistry/Nutrient Movement

Department Head: Professor Dale Gallenberg
Graduate Coordinator: Professor Howard Woodard

For additional information contact:
Mailing address: SDSU Box 2207A
Agriculture Hall — AGH
WWW: http://PlantSci.sdstate.edu
E-mail: Howard_Woodard@sdstate.edu
Phone: 605/688-4774
Fax: 605/688-4667

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. Specializations in Horticultural Crop Management and Machinery Systems and Water Management are offered in collaboration with the Department of Horticulture, Forestry, Landscape Parks, and the Department of Agriculture and Biosystems Engineering, respectively.

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 Chemistry .....3 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, take 1 group (take PS 213, PS 213A, Chem 108, Chem 108L /take Chem 120, Chem 120L).

PS 515 Mycology .....2 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. Crosslisted with Bio 415-515. Corequisite course: PS 515A.

PS 515L Mycology Lab 1
Equivalent to Bio 515A. Corequisite course: PS 515.

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, PS 305, PS 305A. Corequisite course: PS 520A.

PS 520L Biological Control of Arthropods Lab 1
Corequisite course: PS 520.

PS 521 Soil Microbiology 2
Microbial species of agricultural soils, environmental factors affecting their numbers and activity, and biochemical changes brought about by these microorganisms. Crosslisted with Micr 521. Equivalent to Micr 521. P, take 1 group (take Bio 151, Bio 152, Bio 153, Bio 154 /take Bot 201, Bot 202). Corequisite course: PS 521A.

PS 521L Soil Microbiology Lab 0
Equivalent to Micr 521A. P, take 1 group (take Bio 151, Bio 152, Bio 153, Bio 154 /take Bot 201, Bot 202). Corequisite course: PS 521.

PS 531 Applied Insect Ecology 2
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, PS 305, PS 305A. Corequisite course: PS 531A.

PS 531L Applied Insect Ecology Lab.....1
Corequisite course: PS 531.

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, take 1 group (take PS 213, PS 213A, Bio 101, Bio 102 /take Bio 151, Bio 152).

PS 550 Field Studies in Plant Disease Diagnosis .....1 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. Corequisite course: PS 550A.

PS 550L Field Study in Plant Disease Diagnosis Lab 1
Corequisite course: PS 550.

PS 553 Advanced Genetics .....3 F (even years)
Procedures in genetic studies as they relate to molecular and classical genetic applications. Crosslisted with Bio 453-553. Equivalent to Bio 553. P, take Bio 371.

PS 562 Molecular Biology I .....2 F
Charge, partitioning migration of molecules; protein structure, enzymes; DNA structure and properties, procaryotic and eucaryotic 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. Crosslisted with Bio 462-562. Equivalent to Bio 562. P, take Micr 436, Chem 361, Chem 361L.

PS 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. Crosslisted with Bio 464-564. Equivalent to Bio 564. P, take Bio 562 or PS 562.

Sharon Clay
Professor
Ph.D., University of Minnesota-Minneapolis/St. Paul, 1986
Weed Research

James Doolittle
Professor
Ph.D., Texas A & M University, 1991
Soil Chemistry

Martin Draper
Associate Professor
Ph.D., North Dakota State University, 1999
Plant Pathology - Extension

Billy Fuller
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

Amir Ibrahim
Assistant Professor
Ph.D., Colorado State University, 1998
Breeding - Winter Wheat

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
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

Vance Owens
Associate Professor
Ph.D., University of Wisconsin, 1996
Forage Crops - Extension

Diane Rickerl
Professor
Ph.D., Auburn University, 1986
Agroecology

Tom Schumacher
Professor
Ph.D., Michigan State University, 1982
Soil Physics and Conservation

Roy Scott
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
Professor
Ph.D., Howard University, 1985
Molecular Biology

Zeno Wicks, III
Professor
Ph.D., North Dakota State University, 1979
Breeding - Corn

Howard Woodard
Professor
Ph.D., Rutgers University, 1985
Soil Fertility

PS 565 Molecular Biology II Laboratory.....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. Crosslisted with Bio 465/565. Equivalent to Bio 565. P, PS 562 or Bio 562, PS 564 or Bio 564.

PS 580 Environmental Stress Physiology.....3 S (even years)
Physiology and cellular response of plants to environmental stresses. P,

PS 592 Special Topics .....1-6 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 592L Special Topics Lab 1-6

PS 704 Viral and Bacterial Diseases of Plants .....2 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. Corequisite course: PS 704A.

PS 704L Viral and Bacterial Diseases of Plants Lab 2
Corequisite course: PS 704.

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. Corequisite course: PS 714A.

PS 714L Genetics of Disease Resistance and Host-Plant Pathogen Interaction Lab.....1
Corequisite course: PS 714.

PS 720 Insect Anatomy and Physiology.....2 S (odd years)
Introduction to the internal anatomy of insects, and the principles of the physiology of insect cells, tissues, organs and systems. P, PS 305, PS 305A. Corequisite course: PS 720A.

PS 720L Insect Anatomy and Physiology Lab.....1
Corequisite course: PS 720.

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 Insects .....2 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, PS 305, PS 305A. Corequisite course: PS 722A.

PS 722L Behavioral Management of Insects Lab 1
Corequisite course: PS 722.

PS 732 Field Studies in Pedology.....2 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, take 1 group (take PS 310, PS 310L /take Geog 310, Geog 310A).

PS 733 Advanced Soil Genesis.....3 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 Techniques .....1 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 Soils .....3 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, and K.....3 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. P, PS 103, PS 103A, Bio 371.

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.

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. Corequisite course: PS 761L.

PS 761L Taxonomy of Insects Lab **1**
Corequisite course: PS 761.

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 327, Bot 327A.

PS 773 Cytogenetics ..... **2 F (odd years)**
To study the nature and behavior of chromosomes in relation to heredity. P, Bio 343 and Bio 343A, or Bio 371. Corequisite course: PS 773A.

PS 773L Cytogenetics Lab **1**
Corequisite course: PS 773.

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 327, Bot 327A.

PS 785 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. Corequisite course: PS 785A.

PS 785L Soil and Plant Analysis Lab **1**
Corequisite course: PS 785.

PS 786 Biometrical Genetics **3**

PS 787 Advanced Plant Breeding **3**

PS 790 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 791 Advanced Special/Research Problems ..... **1-2 FSSu**
Advanced study and research in crops, plant pathology, and soils. P, instructor's consent required.

PS 792 Special Topics **1-6**
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 798 Thesis, M.S. ..... **1-7 FSSu**

PS 898D 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.

Biological Sciences (BioS) Course Offerings

BioS 890 Ph.D. Seminar ..... **1 FS**

BioS 898D Dissertation—Ph.D. ..... **1-7 FSSu**

Adjunct/Courtesy/Joint Faculty

Randy Anderson
Professor
Ph.D., University of Wyoming, 1980
Weed Science

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

B. Wade French
Assistant Professor
Ph.D., Oklahoma State University
Research Entomology

Leslie Hammack
Assistant Professor
Ph.D., University of Wisconsin-Madison, 1974
Research Entomology

Louis Hesler
Associate Professor
Ph.D., University of California - Davis, 1991
Research Entomology

Alex Kahler
Professor
Ph.D., University of California, 1973
Molecular Biology

Shannon Osborne
Assistant Professor
Ph.D., University of Nebraska, 1999
Soil Fertility

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

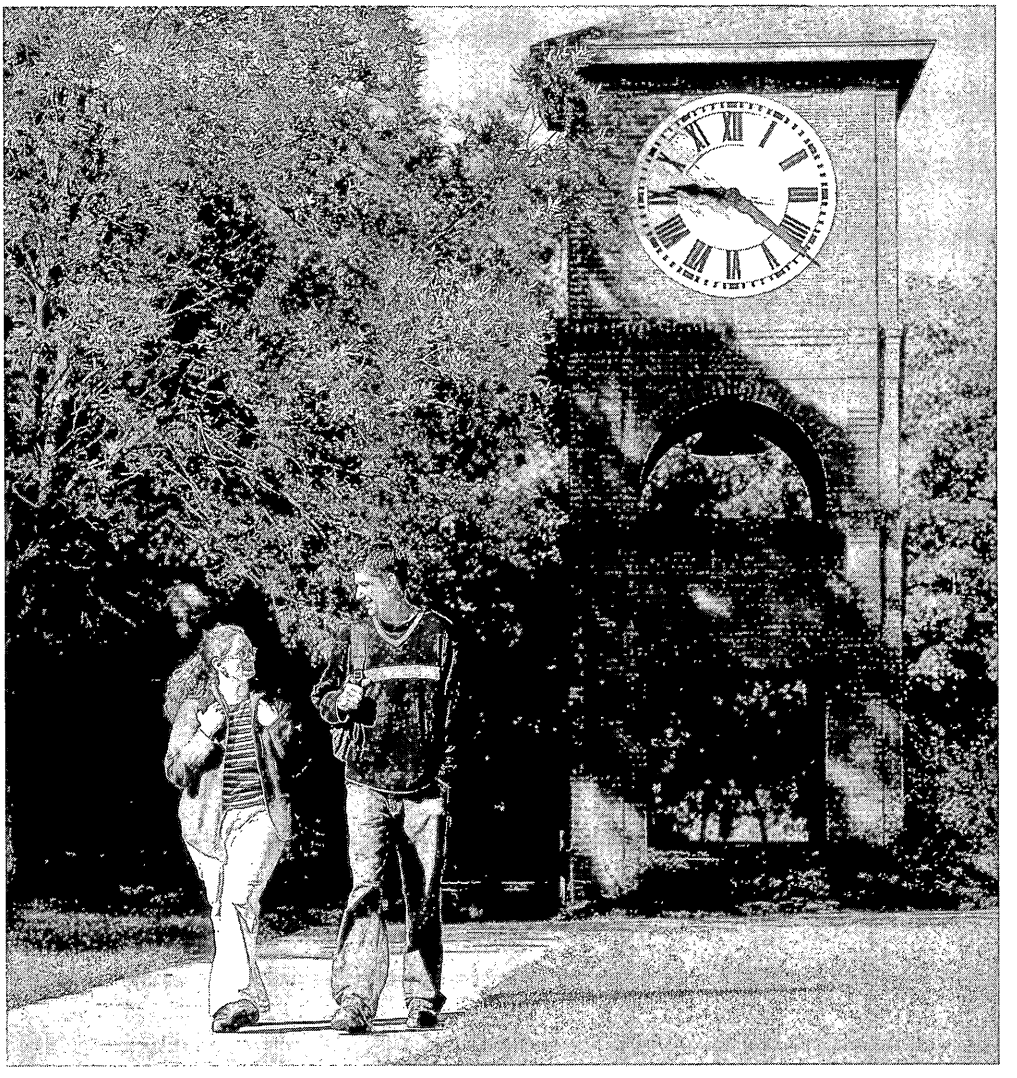
Department Head: Distinguished Professor Robert V. Burns
Graduate Coordinator: Distinguished Professor Robert V. Burns

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 591 Special Problems ..... **1-3 FSSu**
Individual guided research culminating in formal research paper. May be repeated until 6 credits are earned. Instructor's consent required.

PolS 592 Topics in Political Science **1-4**
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.



Psychology

Coursework only offered

Department Head: Professor Virginia Norris

For additional information contact:
Mailing address: SDSU Box 504 *Phone: 605/688-4322*
Scobey Hall — SCO 336 *Fax: 605/688-6754*
WWW: http://www3.sdstate.edu/Academics/CollegeofArtsAndScience/Psychology
E-mail: Virginia_Norris@sdstate.edu

Psychology (Psyc) Course Offerings

Psyc 591 Special Problems in Psychology .....1-4 FSSu
Selected studies for advanced students. P, Psyc 101 or Psyc 102. Instructor's consent required.

Psyc 592 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, Psyc 101 or Psyc 102.

Graduate Faculty

Beverly King
Assistant Professor
Ph.D., Purdue University, 1996
Developmental Psychology

Virginia Norris
Professor
Ph.D., Kent State University, 1991
Health Psychology, Gerontology

Brady Phelps
Associate Professor
Ph.D., Utah State University, 1992 Behavior Analysis, Physiological Psychology

Debra Spear
Associate Professor
Ph.D., University of North Carolina, Greensboro, 1987
Behavior Analysis, Behaviorial Pharmacology, Sensation & Perception

Bradley Woldt
Associate Professor
Ph.D., University of Montana, 1993
Clinical Psychology

Rural Sociology

Degrees Offered:

Ph.D. Sociology

- Cultural Ecology specialization
- Demography specialization
- Family Studies specialization
- Social Deviance specialization
- Social Organization specialization

M.S. Rural Sociology

- Applied Research specialization
- Criminal Justice specialization
- Demography specialization
- Family Studies specialization
- Planning/Development specialization

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 *Phone: 605/688-4132*
Scobey Hall — SCO *Fax: 605/688-6354*
WWW: http://www.abs.sdstate.edu:81/sociology/department/sociology1.htm
E-mail: Donna_Hess@sdstate.edu

Program Description
The Master of Science program is designed to prepare students to continue their academic careers in advanced doctoral programs, enter applied fields such 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 specialization 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 must 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 America .....3 FSSu
Provides prospective teachers and those interested in Indian people with a basic knowledge of Indian heritage and culture. Emphasis on the Dakota Indians. Crosslisted with AIS 421. (Fulfills Teacher Ed. requirement).

Anth 591 Special Problems .....1-3 FSSu
P, open to undergraduate and graduate students with sufficient background. Instructor's consent required.

Anth 592 Topics in Anthropology .....1-3 (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 591 Problems in Criminal Justice 3
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. Instructor's consent required.

Sociology (Soc) Course Offerings

Soc 502 Social Deviance.....3
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 and 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 Delinquency .....3 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 Corrections 3
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 Criminology 3
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.

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.

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 580 Sociology of Law **3**
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, Soc 351.

Soc 585 Applied Sociology ..... **3 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 Organization **3**
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 Stratification **3**
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 Planning **3**
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.

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 790 Seminar .....**1-4 FSSu (on demand)**

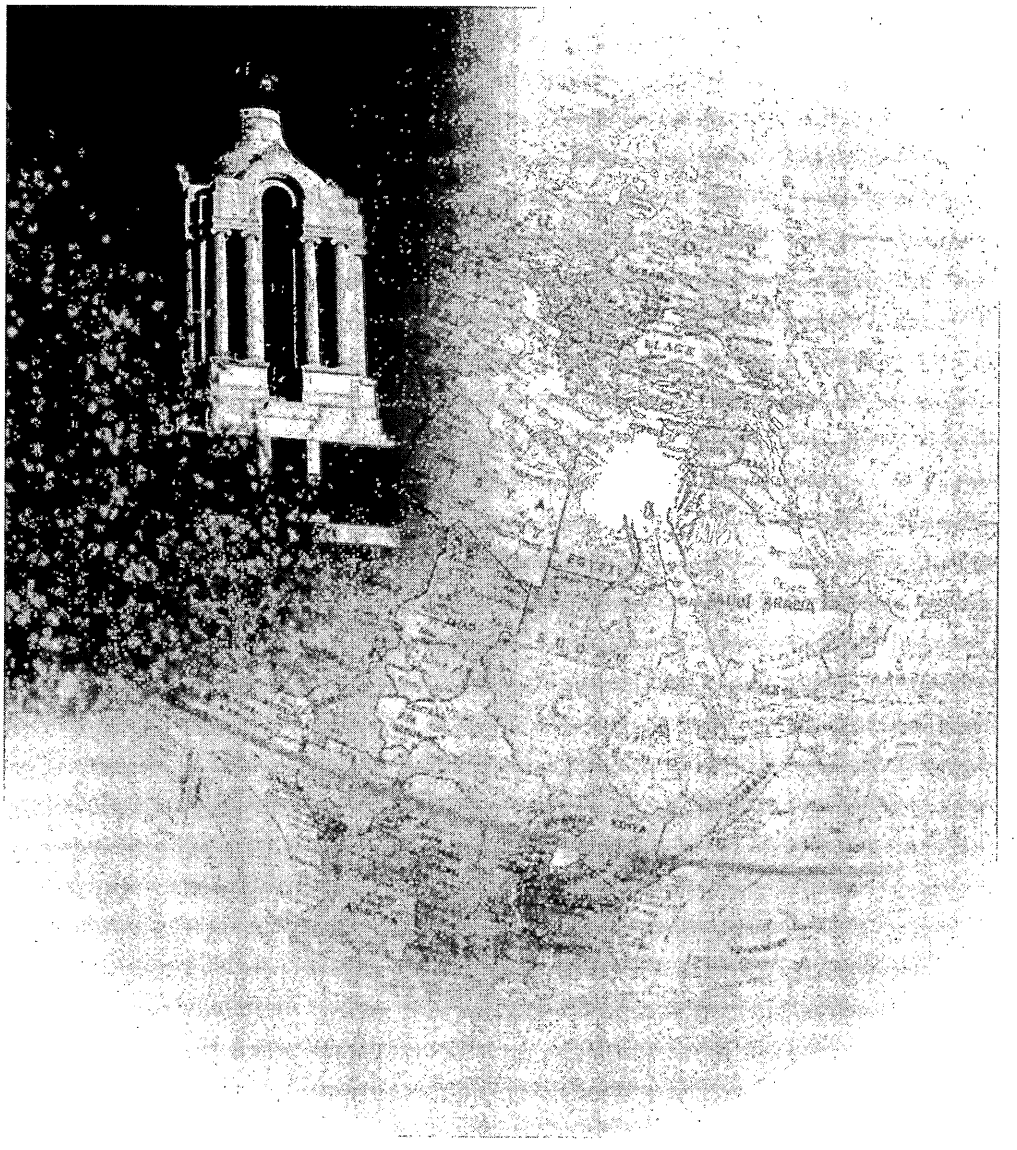
1. Sociology of Religion
2. Advanced Social Psychology
3. Domestic Violence
4. Extra-Ordinary Groups

Soc 791 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. Instructor's consent required.

Soc 794 Internship .....**1-6 FSSu (Pass/Fail)**
P, Major and Planning option. P/F grade. Instructor's consent required.

Soc 798 Thesis .....**1-7 (Pass/Fail)**

Soc 898D Dissertation, Ph.D. as arranged .....**1-12 (Pass/Fail)**



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

Veterinary Science

Degree Offered:

Ph.D. Biological Sciences
- Veterinary Microbiology specialization
- Veterinary Pathobiology specialization

M.S. Animal Sciences
- Veterinary Science specialization

M.S. Biological Sciences
- Veterinary Microbiology specialization
- Veterinary Pathobiology specialization

Graduate Faculty

Christopher Chase
Professor
D.V.M., Iowa State University, 1980
Ph.D., University of Wisconsin, 1990
Virology/Immunology

Jane Christopher-Hennings
Associate Professor
D.V.M., University of Minnesota, 1983
M.S., University of Wisconsin, 1990
Molecular Diagnostics and Research

William 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

David Francis
Professor
Ph.D., University of Missouri-Columbia, 1978
Bacteriology

Department Head: Professor David H. Zeman
Graduate Coordinator: Associate Professor Christopher Chase

For additional information contact:
Mailing address: SDSU Box 2175 *Phone: 605/688-5172*
Animal Disease Research — ADR *Fax: 605/688-6003*
WWW: http://vetsci.sdstate.edu
E-mail: Christopher_Chase@sdstate.edu

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.

Veterinary Science (Vet) Course Offerings

Vet 503 Animal Diseases and Their Control ..... **3 F**

Vet 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. Crosslisted with Micr 424/524. Equivalent to Micr 524. Corequisite course: Vet 524A.

Vet 524L Medical and Veterinary Virology Lab **0**
Equivalent to Micr 524A. Corequisite course: Vet 524.

Vet 591 Problems in Veterinary Science ..... **1-3 FSSu**
Consent of department head required. Instructor's consent required.

Vet 723 Systemic Physiology ..... **4 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. Corequisite course: Vet 723A.

Vet 723L Systemic Physiology Lab **0**
Corequisite course: Vet 723.

Vet 791 Special Problems ..... **1-4 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. Instructor's consent required.

Vet 792 Special Topics ..... **1-3 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. Instructor's consent required.

Biological Sciences (BioS) Course Offerings

BioS 890 Ph.D. Seminar ..... **1 FS**

BioS 898D Dissertation—Ph.D. ..... **1-7 FSSu**

Edward Hamilton
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

Visual Arts

Coursework only offered

Graduate Faculty

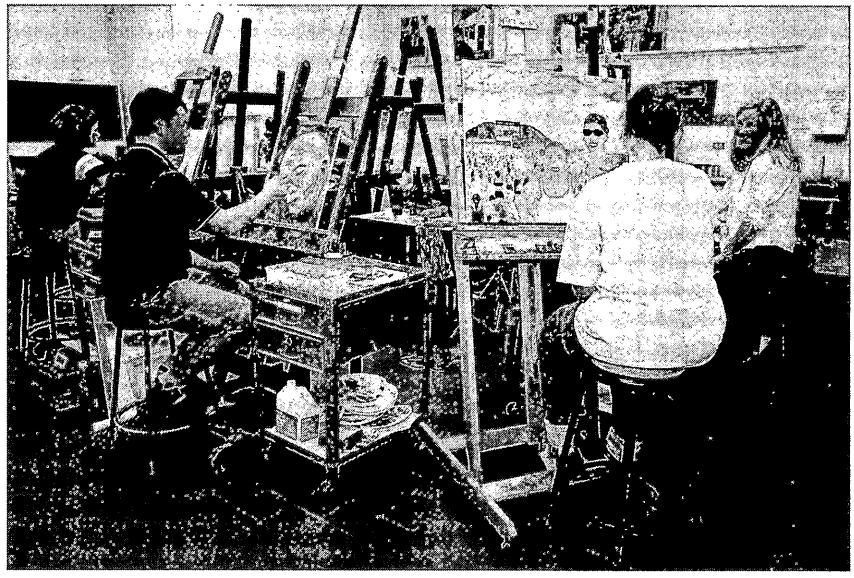
Norman P. Gambill
Professor
Ph.D., Syracuse University, 1976
American Studies, Art History, Film History, Popular Culture

Department Head: Professor Norman P. Gambill

For additional information contact:
Mailing address: SDSU Box 2802
Grove Hall — GH
E-mail: sdsu_artdept@sdstate.edu
Phone: 605/688-4103
Fax: 605/688-6769

Art Education (ArtE) Course Offerings

ArtE 591 Special Problems in Visual Arts **1-3**
Instructor's consent required.



Wildlife and Fisheries Sciences

Degrees Offered:

Ph.D. Biological Sciences, *see page 36*
- Fisheries Science specialization
- Wildlife Science specialization

M.S. Wildlife and Fisheries Sciences
- Fisheries specialization
- Wildlife specialization

Department Head: Professor Charles G. Scalet
Graduate Coordinator: Professor Charles G.Scalet

For additional information contact:
Mailing address: SDSU Box 2140B
Northern Plains Biostress Laboratory — NPB
WWW: http://wfs.sdstate.edu
E-mail: Charles_Scalet@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
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, WL 367, WL 412, and/or consent of instructor. Corequisite course: WL 513A.

WL 513L Advanced Fisheries Management Lab 0
Corequisite course: WL 513.

WL 515* Upland Game Ecology and Management ..... 3 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, WL 411 and/or consent of instructor. Corequisite course: WL 515L.

WL 515L Upland Game Ecology and Management Lab 0
Corequisite course: WL 515.

WL 517* Large Mammal Ecology and Management ..... 3 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, WL 411 and/or consent of instructor. Corequisite course: WL 517L.

WL 517L Large Mammal Ecology and Management Lab 0
Corequisite course: WL 517.

WL 519* Waterfowl Ecology and Management ..... 3 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, WL 411 and/or consent of instructor. Corequisite course: WL 519L.

WL 519L Waterfowl Ecology and Management Lab 0
Corequisite course: WL 519.

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 521. Corequisite course: WL 521L.

WL 521L Grassland Fire Ecology Lab 0
Equivalent to Rang 521L. Corequisite course: WL 521.

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. Corequisite course: WL 523L.

WL 523L Fish Culture Lab 0
Corequisite course: WL 523.

WL 592 Special Topics in Wildlife and Fisheries ..... 1-3 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. Corequisite course: WL 592L.

WL 592L Special Topics in Wildlife and Fisheries Lab 0
Corequisite course: WL 592.

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. Corequisite course: WL 712L.

WL 712L Wetland Ecology and Management Lab 0
Corequisite course: WL 712.

WL 713* Animal Population Dynamics ..... 3 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. Corequisite course: WL 713L.

WL 713L Animal Population Dynamics Lab 0
Corequisite course: WL 713.

WL 714* Fish Structure and Function .....3 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. Corequisite course: WL 714L.

WL 714L Fish Structure and Function Lab.....0
Corequisite course: WL 714.

WL 715* Wildlife Research Design.....3 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. Corequisite course: WL 715L.

WL 715L Wildlife Research Design Lab.....0
Corequisite course: WL 715.

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. Corequisite course: WL 717L.

WL 717L Advanced Limnology Lab.....0
Corequisite course: WL 717.

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. Corequisite course: WL 718L.

WL 718L Ecology of Aquatic Invertebrates Lab.....0
Corequisite course: WL 718.

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. Corequisite course: WL 719L.

WL 719L Stream Ecology and Management Lab.....0
Corequisite course: WL 719.

WL 790 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 791 Research Problems.....1-3 FSSu
Individualized instruction on specific research problems. P, consent of instructor.

WL 798 Thesis.....1-7 FSSu

Biological Sciences (BioS) Course Offerings

BioS 890 Ph.D. Seminar.....1 S

BioS 898D Dissertation—Ph.D......1-7 FSSu

*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.

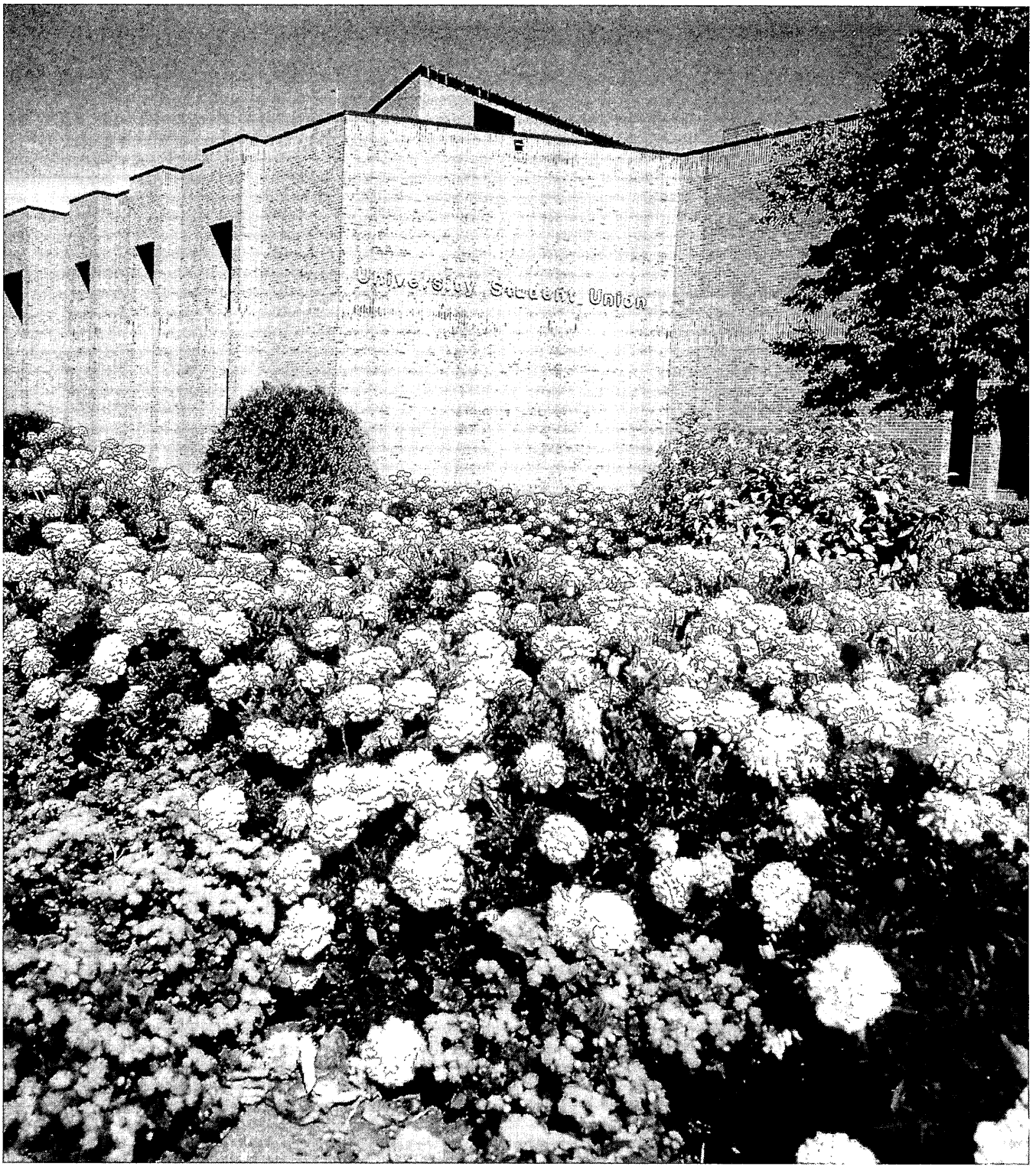
Philosophy Statement for the Ph.D. Degree in
Biological Sciences (Wildlife and Fisheries Sciences)

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.


University Student Union

Graduate Faculty

Abraham, Ross P., Associate Professor of Mathematics and Statistics, 1997; B.S., Augustana College, 1990; M.A., University of Montana, 1993; Ph.D., University of Houston, 1997.

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, Director of Agricultural Information Technology, Associate Professor of Agricultural and Biosystems Engineering, 1990, 2000; 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.

Anderson, Randy L., Adjunct Professor of Plant Science, 2000; B.S., SDSU, 1974; M.S., 1976; Ph.D., University of Wyoming, 1980.

Andrawis, Alfred S., Professor of Electrical Engineering, 1981, 2001; B.S., Alexandria University (Egypt), 1974; M.S., SDSU, 1982; Ph.D., Virginia Polytechnic Institute and State University, 1991.

Andrawis, Madeleine Y., Professor of Electrical Engineering, 1980, 2001; B.S., Cairo University (Egypt), 1977; M.S., SDSU, 1983; Ph.D., Virginia Polytechnic Institute and State University, 1991.

Arwood, Donald, Professor of Rural Sociology, 1986, 1999; B.S., SDSU, 1980, M.S., 1982; Ph.D., 1989.

Baer, Robert, 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.

Baron, Mark, Adjunct Faculty

Baker, Philip R., Professor and Head of Modern Languages, 1973, 1999; B.A., University of Connecticut, 1959; M.A., Middlebury College, 1965; M.A.T., University of Hartford, 1968; Ph.D., Florida State University, 1973.

Bassett, Kurt D., Coordinator of IAC Lab and Associate Professor of Mechanical Engineering, 1982, 1997; B.S., SDSU, 1981; M.S., 1983; Ph.D., North Dakota State University, 1995.

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.

Berry, Jr., Charles R., Adjunct Professor of Wildlife and Fisheries Sciences, 1985, 1991; B.S., Randolph-Macon College, 1967; M.S., 1970; Ph.D., Virginia Polytechnic Institute and State University, 1976.

Beutler, Martin K., Director of West River Ag Center and Professor of Economics, 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, 1999; B.S., SDSU, 1977; M.A., University of Iowa, 1984; Ph.D., 1987.

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 and Professor of Health, Physical Education and Recreation, 1967, 1983; B.A., Nebraska Wesleyan University, 1965; 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.

Bright, Larry, Adjunct Faculty

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, Lewis F., Dean of the College of Engineering, Professor of Electrical Engineering, 1992, 2001; B.S., SDSU, 1984; M.S., Iowa State University, 1986; Ph.D., 1988.

Brown, Michael L., Associate Professor of Wildlife and Fisheries Sciences, 1994, 1998; 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, 2001; B.S., SDSU, 1986; M.S., Kansas State University, 1992; M.S., 1993; Ph.D., 1997.

Burns, Robert V., Distinguished Professor, Head of Political Science and Philosophy and Religion, Director of Honors College, 1970, 1994; B.S., SDSU, 1964; M.A., University of Missouri, 1966; Ph.D., 1973.

Campbell, Emilie M.G., Assistant Professor of Animal and Range Sciences, 2000; 2002, B.S., Brigham Young University, 1994; Ph.D., Texas A&M University, 1998.

Card, Karen, Adjunct Faculty

Carlson, C. Gregg, Extension Specialist/Professor of Plant Science, 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, 1985; 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.

Catangui, Michael A., Extension Entomologist/Assistant Professor of Plant Science, 1986, 1998; B.S., University of the Philippines, 1982; M.S., SDSU, 1987; Ph.D., University of Nebraska, 1992.

Chase, Christopher, Professor, Animal Disease Research and Diagnostic Lab, 1992, 2001; M.S., University of Wisconsin, 1987; Ph.D., 1990; D.V.M., Iowa State University, 1980.

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., Professor and Head of Biology and Microbiology, 1990, 2000; B.S., University of Wyoming, 1976; M.S., 1978; Ph.D., Purdue University, 1982.

Chipman, Helen, EFNEP Coordinator and Associate Professor, Extension Family and Consumer Sciences, 1992, 1997; B.S., Utah State University, 1980; M.S., Colorado State University, 1988; Ph.D., 1992.

Chipps, Steven R., Adjunct Assistant Professor of Wildlife and Fisheries Sciences, 1999; B.S., Davis and Elkins College, 1990; M.S., West Virginia University, 1992; Ph.D., University of Idaho, 1997.

Cholick, Fred A., Dean of the College of Agriculture and Biological Sciences, Professor of Plant Science, 1981, 1998; B.S., Oregon State University, 1972; M.S., Colorado State University, 1975; Ph.D., 1977.

Christopher-Hennings, Jane, Associate Professor of Animal Disease Research and Diagnostic Lab, 1990, 2000; B.S., University of Wisconsin, 1975; M.S., 1990; D.B.M., University of Minnesota, 1983.

Clapper, Jeffrey A., Assistant Professor of Animal and Range Sciences, 1997; B.S., Ohio State University, 1982; M.S., 1987; Ph.D., Purdue University, 1992.

Clay, David E., Professor of Plant Science, 1989, 2001; B.S., University of Wisconsin, 1976; M.S., University of Idaho, 1984; Ph.D., University of Minnesota, 1988.

Clay, Sharon A., Professor of Plant Science, 1989, 1998; B.S., University of Wisconsin, 1977; M.S., University of Idaho, 1982; Ph.D., University of Minnesota, 1986.

Clem, James, Associate Professor of Clinical Pharmacy, 1992, 1997; 2001; B.S., University of Iowa, 1989; Pharm.D., 1991.

Cogswell, Kurt D., Associate Professor of Mathematics and Statistics, 1997, 2001; B.S., Massachusetts Institute of Technology, 1978; M.S., North Dakota State University, 1991; Ph.D., Northwestern University, 1996.

Cole-Dai, Jihong, Assistant Professor of Chemistry and Biochemistry, 2000; B.S., University of Science and Technology of China, 1982; M.S., University of Maryland, 1984; Ph.D., 1987.

Craig, Gloria P., Assistant Professor of Nursing and Head of Nursing Student Services, 1998, 2000; B.S.N., Buena Vista College, 1989; M.S.N., Drake University, 1993; Ed.S., 1996; Ed.D., 1997.

Crain, David A., Professor of History, 1973, 1983; B.A., Pittsburgh State University, 1960; M.A., George Washington University, 1962; Ph.D. Indiana University, 1972.

Creal, Tim, Assistant Professor of Education and Counseling, Rapid City Site, 2001; B.S., Black Hills State University, 1978; M.S., SDSU, 1990; Ed.S., University of South Dakota, 1994; Ed.D., 1996.

Crews, Georgia W., Assistant Professor of Nutrition, Food Science and Hospitality, 1984; 2002; B.S., Middle Tennessee State University, 1968; M.S., University of Tennessee, 1970; Ph.D., Kansas State University, 2000.

Crews, Michael G., Professor of Nutrition, Food Science and Hospitality, 1984, 1990; B.S., Virginia Polytechnic Institute and State University, 1972; Ph.D., 1978.

Cumber, Carol J., Associate Professor of Economics, 1990, 1998; B.A., North Dakota State University, 1979; M.B.A., 1984; Ph.D., SDSU, 1994.

Currie, Bruce L., Professor and Head of Pharmaceutical Sciences, 2000; B.S., Arizona State University, 1966; Ph.D., University of Utah, 1970.

Cutler, Kay Marie-Zenk, Assistant Professor of Human Development, Consumer and Family Sciences, 1997; B.A., University of Minnesota, 1989; Ph.D., University of Texas, 1995.

Danker, Kathleen A., Professor of English, 1990, 2001; B.A., University of Nebraska, 1971; M.A., 1974; Ph.D., 1985.

Dave, Rajiv I., Assistant Professor of Dairy Science, 1999; B.S., Gujarat Agricultural University, 1986; M.S., 1991; Ph.D., Victoria University of Technology, 1998.

DeBoer, Delvin, Professor of Civil and Environmental Engineering, 1978, 1997; B.S., SDSU, 1978; M.S., 1980; Ph.D., Iowa State University, 1990.

Delfanian, Fereidoon, Professor of Mechanical Engineering, 1979, 2001; B.S., SDSU, 1977; M.S., 1980; Ph.D., North Dakota State University, 1995.

Dieter, Carla J., Assistant Professor of Nursing and Family Nurse Practitioner, Student Health Services, 1984, 2001; 2002; B.S.N., University of Nebraska, 1978; M.S., SDSU, 1989; Ed.D., University of South Dakota, 2001.

Dieter, Charles, Associate Professor of Biology and Microbiology, 1987, 2000; B.S., Concordia Teachers College, 1977; M.S., SDSU, 1987; Ph.D., 1993.

Dobbs, Thomas L., Professor of Economics, 1978, 1982; B.S., SDSU, 1965; Ph.D., University of Maryland, 1969.

Donovan, Kathleen, Associate Professor and Head of English, 1994, 2000; B.A., Spalding College, 1968; M.A., University of Nebraska, 1988; Ph.D., University of Arizona, 1994.

Doolittle, James J., Professor of Plant Science, 1991, 2001; B.S., Purdue University, 1982; M.S., Texas A&M University, 1986; Ph.D., 1991.

Draper, Martin A., Associate Professor of Plant Science, 1997, 2001; B.S., Iowa State University, 1982; M.S., North Dakota State University, 1985; Ph.D., 1999.

Dwivedi, Chandradhar, Distinguished Professor of Pharmaceutical Sciences/Coordinator of Graduate Studies, 1987, 2000; B.S., Gorakhput University, 1964; M.S., 1966; Ph.D., Lacknow University, 1972.

Ellsbury, Michael M., Adjunct Associate Professor of Plant Science, 1992; B.A., University of Colorado, 1970; M.S., 1974; Ph.D., University of Arizona, 1979.

Engstrom, Royce C., Adjunct Professor of Chemistry and Biochemistry, 1995; B.S. University of Nebraska, 1975; Ph.D., University of Wisconsin, 1979.

Enevoldsen, Bernadine L., Professor of Human Development, Consumer and Family Sciences, 1964, 2001; B.S., SDSU, 1964; M.S., 1986; Ph.D., University of Minnesota, 1993.

Epperson, William, Associate Professor of Veterinary Science, 1994, 1998; 2001; B.S., Ohio State University, 1985; M.S., 1990; D.V.M., 1985.

Erickson, Alan K., Associate Professor of Veterinary Science, 1990, 1998; B.A., Minot State College, 1983; B.A., 1984; Ph.D., North Dakota State University, 1989.

Erion, Ralph L., Professor and Acting Head in Education and Counseling, 1985, 1996; B.A., Inter American University, 1972; M.A.Ed., 1975; Ph.D., Texas A&M University, 1985.

Evans, David A., Professor of English and Writer in Residence, 1968, 1978; B.A., Morningside College, 1962; M.A., University of Iowa, 1964; M.F.A., University of Arkansas, 1976.

Evenson, Donald P., Distinguished Professor of Chemistry, 1981, 1996; B.A., Augustana College, 1964; Ph.D., University of Colorado, 1968.

Fausti, Scott W., Professor of Economics, 1991, 1996; B.A., North Dakota State University, 1986; M.S., University of Illinois, 1988; Ph.D., 1991.

Fellner, Michael J., Assistant Professor of Education and Counseling, Rapid City Site, 2001; B.A., University of New York, 1967; M.A., Temple University, 1969; Ph.D., University of Texas, 1973.

Fennell, Anne, Associate Professor of Horticulture, Forestry, Landscape and Parks, 1992, 1997; B.S., Iowa State University, 1979; M.S., University of Minnesota, 1982; Ph.D., 1985.

Ferguson, Jerry L., Professor of Communication Studies and Theatre, 1970, 1982; B.S., SDSU, 1964; M.A., University of South Dakota, 1965; Ph.D., Southern Illinois University, 1973.

Flake, Lester D., Distinguished Professor of Wildlife and Fisheries Sciences, 1972, 1999; B.S., Brigham Young University, 1965; M.S., 1966; Ph.D., Washington State University, 1971.

Flynn, M. L., Professor of English, 1990, 2000; Ph.B., DePaul University, 1969; M.A., University of Missouri, 1977; Ph.D., 1985.

Foland, Kay L., Associate Professor of Nursing and Head of West River Nursing, 1982, 1999; B.S., SDSU, 1980; M.S.N., University of Nebraska, 1982; Ph.D., University of Texas, 1989.

Francis, David H., Professor of Veterinary Science, 1978, 1988; B.S., Brigham Young University, 1971; M.S., 1974; Ph.D., University of Missouri, 1978.

French, B. Wade, Adjunct Assistant Professor of Plant Science, 2000; B.S., University of Oklahoma, 1981; M.S., Brock University, 1986; Ph.D., Oklahoma State University, 1998.

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Froehlich, Donell P., Professor and Head of Mechanical Engineering, 1982, 1992; B.S., SDSU, 1972; M.S., 1973; Ph.D., Cornell University, 1976.

Fuller, Billy W., Professor of Plant Science, 1988, 2000; B.S., Auburn University, 1976; M.Ed., Auburn University, 1978; M.S., Clemson University, 1982; Ph.D., Louisiana State University, 1987.

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Galipeau, David W., Professor of Electrical Engineering, 1992, 2001; B.E., University of Rhode Island, 1971; M.S., University of Maine, 1989; Ph.D., 1992.

Gallenberg, Dale J., Professor and Head of Plant Science, 1984, 1996; B.S., University of Wisconsin, 1978; M.S., Cornell University, 1982; Ph.D., 1984.

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Garnos, Michael L., Assistant Professor of Education and Counseling, 2000; B.A., Dakota Wesleyan University, 1970; M.S., Mankato State University, 1979; Ed.D., University of Northern Colorado, 1993.

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Gibbons, William, Professor of Biology and Microbiology, 1980, 1997; B.S., SDSU, 1980; B.S., 1980; M.S., 1982; Ph.D., 1987.

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Kelley, Van C., Head and Associate Professor of Agricultural and Biosystems Engineering, Director of Water Resources Institute, 1978, 2000; B.S., Texas A&M University, 1976; M.A., New Mexico State University, 1978; Ph.D., University of Illinois, 1999.

Kephart, Kevin D., Associate Dean and Director of Agricultural Experiment Station/Professor, 1986, 1999; B.S., Montana State University, 1979; M.S., University of Wyoming, 1982; Ph.D., Iowa State University, 1986.

Kim, Han J., Professor of Economics, 1967, 1979; A.A., San Joaquin Delta College, 1958; B.A., University of California, 1960; M.A., University of Oregon, 1962; Ph.D., Oregon State University, 1969.

Kindermann, Ross P., Professor of Mathematics and Statistics, 1988, 1996; B.A., Dartmouth College, 1972; M.S., University of Illinois, 1974; Ph.D., 1978.

King, Beverly R., Assistant Professor of Psychology, 1997; B.S., Concord College, 1980; M.A., East Tennessee State University, 1990; Ph.D., Purdue University, 1996.

Kitterman, John H., Associate Professor of Physics, 1983, 1988; B.S., University of Kansas, 1959; M.S., 1961; Ph.D., Colorado State University, 1970.

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Lamberton, Charles E., Professor of Economics, 1974, 1984; B.B.A., University of Minnesota, 1960; M.S., University of Wyoming, 1970; Ph.D., Iowa State University, 1975.

Langham, Marie A. C., Professor of Plant Science, 1991, 2001; B.S., East Texas State University, 1975; M.S., 1977; Ph.D., Texas A&M University, 1986.

Larson, Gary E., Professor of Biology and Microbiology, 1979, 1989; B.S., Kearney State College, 1972; Ph.D., North Dakota State University, 1979.

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Maddock, Robert J., Meat Scientist and Assistant Professor of Animal and Range Sciences, 2000; 2002; B.S., North Dakota State University, 1995; M.S., 1997; Ph.D., Texas A&M University, 2000.

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Maleki, Reza A., Professor and Head of Engineering Technology and Management, Director of Polytechnic Center of Excellence, 1998; B.S., North Dakota State University, 1981; M.S., 1982; Ph.D., 1989.

Malo, Douglas D., Distinguished Professor of Plant Science, 1975, 1999; B.S., Iowa State University, 1971; M.S., North Dakota State University, 1974; Ph.D., 1975.

Marquardt, Steve R., Dean of Libraries, Professor of Library Science, 1996; B.A., Macalester College, 1966; M.A., University of Minnesota, 1970, 1974; Ph.D., 1978.

Marshall, Donald M., Professor of Animal and Range Sciences, 1984, 1995; B.S., University of Missouri, 1979; M.S., Oklahoma State University, 1981; Ph.D., 1984.

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Martin, Francis A., Acting Dean of the College of Education and Counseling, Professor of Counseling and Human Resource Development, 1999, 2001; B.A., Oklahoma Baptist University, 1963; M.Div., Southern Baptist Theological Seminar, 1969; Ph.D., 1973.

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Mendelsohn, Robert D., Professor of Rural Sociology, 1976, 1986; B.S., Illinois State University, 1967; M.S., Western Michigan University, 1971; Ph.D., 1973.

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Marken, Jack W., Professor Emeritus of English, 1967, 1986; B.A., Akron University, 1947; M.A., Indiana University, 1950; Ph.D., 1953.

Markland, Ben, Professor Emeritus of Journalism and Mass Communication, 1966, 1975; B.A., University of Arizona, 1947; M.A., Northwestern University, 1951; Ph.D., University of Michigan, 1955.

Martin, Dean, Associate Professor Emeritus of Horticulture, 1955, 1987; B.S., SDSU, 1949; M.S., 1966.

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.D., 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.

McRoberts, Donald E., Associate Professor Emeritus of Chemistry, 1956, 1985; B.S., Montana State University, 1943; M.S., 1963.

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; M.S., SDSU, 1959.

Minyard, Joe A., Professor Emeritus of Animal Science, 1953, 1987; B.S., West Texas State University, 1951; M.S., SDSU, 1959.

Monahan, Maurice L., Professor Emeritus of Mathematics, 1956, 1999; B.S., SDSU, 1956; M.S., University of Illinois, 1964.

Moore, Donald, Associate Professor Emeritus of Electrical Engineering, 1987, 1992; B.A., University of Nebraska, 1942; Ph.D., University of California, 1948.

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.

Morrill, Keith, Associate Professor Emeritus of Biology, 1968, 1975; B.S., SDSU, 1959; M.A., University of South Dakota, 1963.

Murra, Gene, Professor Emeritus of Economics, 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.

Nelson, David S., Professor Emeritus of Philosophy, 1968, 2001; B.A., Augustana College, 1960; M.S., S.D. School of Mines and Technology, 1962; Ph.D., University of Oregon, 1967.

Nelson, Gorman R., Associate Professor Emeritus of Mathematics, 1963, 1984; B.A., Augustana College, 1934; M.S., S.D. School of Mines and Technology, 1963.

Nelson, Joy, Instructor Emerita of Nursing, 1966, 1977; B.A.E., Art Institute of Chicago, 1952.

O'Connell, James, Extension Specialist Emeritus, 1936, 1985; B.S., SDSU, 1935.

Ollenburg, Ella, Professor Emerita of Extension, 1947, 1985; B.S., Dakota Wesleyan University, 1934.

Omodt, Gary W., Professor Emeritus of Pharmaceutical Sciences, 1958, 1968; B.S., University of Minnesota, 1953; Ph.D., 1959.

Ostroot, Kenneth, Professor Emeritus of Extension, 1946, 1984; B.S., SDSU, 1940; M.S., 1963.

Pahl, Darrel, Assistant Professor Emeritus of Agricultural and Biosystems Engineering, 1951, 1985; B.S., SDSU, 1950.

Palmer, Ivan S., Professor Emeritus of Chemistry and Biochemistry, 1955, 1973; B.S., SDSU, 1955; M.S., 1956; Ph.D., Pennsylvania State University, 1960.

Paradise, Francis C., Associate Professor Emeritus of Mechanical Engineering, 1959, 1979; B.S., University of Nebraska, 1940.

Parker, Floyd W., Professor Emeritus of Physics, 1965, 1985; B.S., Colorado State University, 1938; M.S., University of Iowa, 1941; Ph.D., University of Tennessee, 1955.

Parsons, John G., Professor and Head Emeritus of Dairy Science, 1968, 2001; B.S., University of Manitoba, 1961; M.S., 1963; Ph.D., Pennsylvania State University, 1968.

Pedersen, James O., Professor of Education/Dean of General Registration Emeritus, B.S., SDSU, 1955; M.S., 1962; Ph.D., Purdue University, 1968.

Pengra, Robert M., Professor Emeritus of Microbiology, 1957, 1981; B.S., SDSU, 1951; M.S., 1953; Ph.D., University of Wisconsin, 1959.

Petersen, Marvin E., Associate Professor Emeritus of Electrical Engineering, 1982, 1989; B.S., S.D. School of Mines and Technology, 1948; M.S., Massachusetts Institute of Technology, 1957.

Peterson, Evelyn T., Professor Emerita of Nursing, 1954, 1993; B.S., University of Washington, 1951; M.N., 1958; D.N.Sc., 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.

Piersel, David, Professor Emeritus of Music, 1978, 2000; B.M.E., Simpson College, 1958; M.A., University of Iowa, 1964; Ph.D., 1970.

Plumart, Phillip E., Professor Emeritus of Animal Science, 1961, 1990; B.S., University of Illinois, 1950; M.S., Kansas State University, 1952.

Powers, James E., Professor Emeritus of Clinical Pharmacy, 1983, 2000; B.S., University of Wisconsin, 1957; Pharm.D., University of Minnesota, 1983.

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.

Redhead, Ruth W., Distinguished Professor Emerita of Foreign Languages, 1962, 1989; B.Ed., University of Vermont, 1945; M.A., University of Minnesota, 1954; Ph.D., 1971.

Redman, Kenneth, Professor Emeritus of Pharmacognosy, 1951, 1973; B.S., University of Washington, 1930; Ph.D., University of Wisconsin, 1941.

Reeves, Dale L., Professor Emeritus of Plant Science, 1970, 1980; B.S., Kansas State University, 1958; M.S., 1963; Ph.D., Colorado State University, 1969.

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.

Richardson, Marilyn, Associate Professor Emerita of Health, Physical Education and Recreation, 1963, 1994; B.A., Brigham Young University, 1956; M.A., Pennsylvania State University, 1963.

Rollag, Dwayne A., P.E., Professor and Head of Civil and Environmental Engineering, 1965, 1979; B.S., University of Minnesota, 1959; M.S., SDSU, 1966; Ph.D., Purdue University, 1975.

Romans, John R., Professor Emeritus of Animal and Range Sciences, 1962, 1997; B.S., Iowa State University, 1955; M.S., SDSU, 1964; Ph.D., 1967.

Rose, Madeleine S., Associate Professor Emerita of Nutrition, Food Science & Hospitality, 1990, 2000; B.S., University of California, 1970; M.S., University of Maryland, 1972; Ph.D., Texas Woman's University, 1985.

Rose, Robert, Associate Professor Emeritus of Nutrition, Food Science & Hospitality, 1988, 2000; B.S., SDSU, 1970; M.S., University of Maryland, 1972; Ph.D., Texas Woman's University, 1991.

Royer, Paul, Professor Emeritus of Music, 1968, 1987; B.M., Cincinnati College of Music, 1947; M.M., 1949.

Rue, Rolland R., Professor Emeritus of Chemistry and Biochemistry, 1962, 1983; B.A., Macalester College, 1957; Ph.D., Iowa State University, 1962.

Sander, Duane, Dean and Professor Emeritus of Electrical Engineering, 1967, 1999; B.S., S.D. School of Mines and Technology, 1960; M.S., Iowa State University, 1962; Ph.D., 1964.

Sanderson, Cecil, Professor Emeritus of Extension, 1937, 1984; B.S., SDSU, 1937; M.S., 1964.

Sandfort, John F., Professor Emeritus of Mechanical Engineering, 1958, 1977; B.S., Ohio State University, 1933; B.S., 1934; M.S. Iowa State University, 1947.

Satterlee, James L., Professor Emeritus and Head 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.

Slyter, Lowell, Professor Emeritus of Animal and Range Sciences, 1970, 2001; B.S., Kansas State University, 1964; M.S., University of Nebraska, 1966; Ph.D., Kansas State University, 1969.

Sogn, Arthur B., Associate Professor of Economics Extension Emeritus, 1968, 1974; B.S., SDSU, 1948; M.S., 1959.

Sorenson, Jerry A., Professor Emeritus of General Engineering Technology, 1984, 2000; B.S.E., University of South Dakota, 1963; M.Ed., University of Illinois, 1967.

Spinar, Leo H., Professor Emeritus of Chemistry and Biochemistry, 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, 1962, 1977; B.A., Coe College, 1933; M.S., Iowa State University, 1948.

Storry, Junis O., Dean and Professor Emeritus of Electrical Engineering, Amdahl Distinguished Professor of Engineering, 1967, 1986; B.S., SDSU, 1942; M.S., 1949; Ph.D., Iowa State University, 1969.

Stuart, Signe, Professor Emerita of Visual Arts, 1972, 1974; B.A., University of Connecticut, 1959; M.A., University of New Mexico, 1960.

Svec, Harry R., Assistant Professor Emeritus of General Engineering, 1940, 1958.

Swanson, Robert N., Professor Emeritus of Veterinary Science, 1965, 1996; B.S., Ft. Hays Kansas State College, 1953; M.S., Kansas State University, 1960; D.V.M., 1960; Ph.D., 1964.

Taylor, Donald C., Professor Emeritus of Economics, 1980, 1996; 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.

Trapp, Lansford E., Assistant Professor Emeritus of Mathematics, 1967, 1983; B.S., SDSU, 1948; M.S., Kansas State University, 1950.

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, 1962, 1970; B.S. Trinity College, 1950; M.S., 1952; Ph.D., Pennsylvania State University, 1955.

Wagner, Mary K., Assistant Professor Emerita of Rural Sociology, 1990, 1996; B.A., University of South Dakota, 1954; M.Ed., SDSU, 1974; Ph.D., 1978.

Wagner, Robert T., President Emeritus, Professor Emeritus of Rural Sociology, Distinguished Regental 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; D.D., 2000.

Wahlstrom, Richard C., Distinguished Professor Emeritus of Animal and Range Sciences, 1952, 1988; B.S., University of Nebraska, 1948; M.S., University of Illinois, 1950; Ph.D., 1952.

Walker, Darwin E., Professor Emeritus of Music, 1973, 1979; B.S., Northern State University, 1959; M.A., University of Northern Colorado, 1968; Ed.D., 1972.

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.

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.

West, George A., Professor Emeritus of English, 1969, 2000; B.S., SDSU, 1965; M.A., University of Nebraska, 1967; Ph.D., 1972.

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 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 University, 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 University, 1955; M.S.Ed., 1958; Ed.D., University of Nebraska, 1971.

Wiersma, John L., Professor Emeritus of Agricultural and Biosystems 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, Edward, Associate Professor Emeritus of Plant Science, 1947, 1990; B.S., SDSU, 1947; M.S., 1952.

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, Food Science & Hospitality, 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.

Yost, Josie L., Associate Professor Emerita of Textiles, Clothing, and Interior Design, 1973; B.S., Syracuse University, 1960; M.A., 1962.

INDEX

N

O

P

R

S

T

U

V

W

Z

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. $35.00 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

SDSU

Administration Building 130, 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: ☐ USA ☐ Resident Alien ☐ Other (specify citizenship) _____ Country of Birth _____

Have you obtained a visa? ☐ Y ☐ N If yes, type of visa: _____ Date of initial entry into the U.S. _____

Have you lived in South Dakota for the past 12 months? ☐ Y ☐ N 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

School Name City State Dates Attended

School Name City State Dates Attended

Standardized admissions tests taken (GRE, MAT, TOEFL) minimum TOEFL of 525 required _____
Name of Test Latest date test taken Score

Have you ever been dismissed from any college? ☐ Y ☐ N If yes, when and for what reason? _____

Have you ever applied for admission to another graduate school? ☐ Y ☐ N If yes, what college? _____ Were you admitted? ☐ Y ☐ N

PROFESSIONAL OBJECTIVE

Semester/year you wish to enroll: _____
Indicate Spring/Summer/Fall Year

Are you planning to work on a master's or doctoral degree at SDSU? ☐ Master's ☐ Doctoral ☐ 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 _____

Specialization or emphasis _____

Have you previously applied as a Graduate Student at SDSU? ☐ Y ☐ N 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 _____

SDSU
Graduate School
Administration Building 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. List recommender's name: _____
Describe your personal contact with the recommender:

_____

_____

_____

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 in 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.

1. I have verified that the courses listed in item C were taken under my direction. ❑ Y ❑ No

2. ❑ 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.)

3. 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

4. I would be pleased to have the applicant working under my direction as a: ❑ Research Assistant ❑ Administrative Assistant ❑ Teaching Assistant ❑ Fellowship

(continue on back)

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? ❑ Y ❑ 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	❑	❑
I recommend for	❑	❑
I recommend with reservations for	❑	❑
I do not recommend for	❑	❑

Signature of recommender _____ Date _____

Name _____ Title _____
Print or type

Institution _____

Address _____ Telephone _____

SDSU
Graduate School
Administration Building 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. List recommender's name: _____
Describe your personal contact with the recommender:

_____

_____

_____

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 in 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.

1. I have verified that the courses listed in item C were taken under my direction. ❑ Y ❑ No

2. ❑ 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.)

3. 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

4. I would be pleased to have the applicant working under my direction as a: ❑ Research Assistant ❑ Administrative Assistant ❑ Teaching Assistant ❑ Fellowship

(continue on back)

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	❑	❑
I recommend for	❑	❑
I recommend with reservations for	❑	❑
I do not recommend for	❑	❑

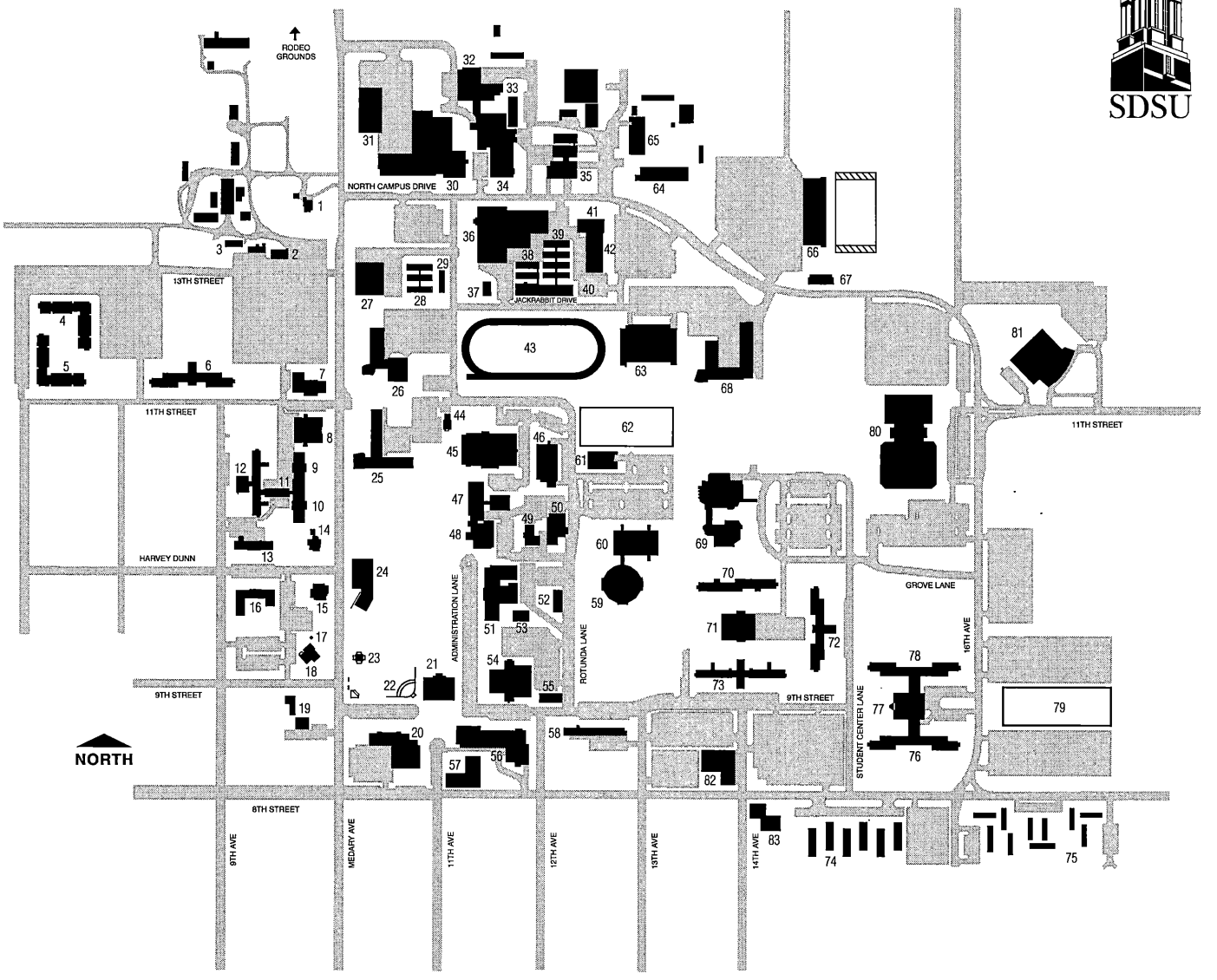
Signature of recommender _____ Date _____

Name _____ Title _____
Print or type

Institution _____

Address _____ Telephone _____

SDSU Campus Map



Administration Building (Doner Auditorium) 51
Ag Vehicle Storage (Surplus Property Storage)....3
Agricultural Communications Center (Ag Comm)....53
Agricultural Engineering....68
Agricultural Hall....25
Agricultural Heritage Museum....7
Alvilda M. Sorenson Family Resource & Management Center (FRMC)....15
Animal Disease Research & Diagnostic Laboratory....34
Animal Resource Wing....32
Animal Science Arena....31
Animal Science Complex....30
Bailey Hall....4
Berg Hall....5
Binnewies Hall....76
Briggs Library....63
Brown Hall....73
Catholic Campus Parish....82
Central Heating Plant....50
Communications Center (University Relations)....52
Coolidge Sylvan Theatre....22
Coughlin-Alumni Stadium....66
Coughlin-Alumni Stadium Locker Room....67
Coughlin Campanile....23
Crothers Engineering Hall....56
Dairy Microbiology....26
Dean of Agriculture Residence (Former)....1
DePuy Military Hall....61
East Headhouse....39
East Tennis Courts....79
Ethel Austin Martin Building (Biology Annex)....44
Foundation (SDSU)....19
Foundation Seed Conditioning Plant....35
Frost Arena (Stanley J. Marshall HPER Center)....80
Grove Hall....71
Guilford C. Gross Pharmacy Building....48
Hansen Hall....6
Harding Hall....58
Heat / Power Laboratory....49
Hilton M. Briggs Library....63
Horticulture & Forestry....41
Horticulture Greenhouse....42
Industrial Arts Building....55
Intramural Building....45
Larson Commons (Food Service)....77
Library (Hilton M. Briggs Library)....63
Lincoln Music Center (Peterson Recital Hall)....21
Mathews Hall....70
Medary Commons (CAP Center, Food Service)....8
Memorial Park....62
Motor Pool Complex....2
Northern Plains Biostress Laboratory....36
Nursing, Family & Consumer Sciences, & Arts & Science Building (NFA)....60
Performing Arts Center....81
Peterson Recital Hall (Lincoln Music Center)....21
Physical Plant Shops....64
Physiology Laboratory....37
Pierson Hall....72
Plant Science Building....40
Plant Science Seedhouse....27
Plant Science West Greenhouses....38
Print Lab....46
Pugsley Continuing Education Center (RDTN Studios/Classrooms, Christie Ballroom)....20
Rotunda for Arts & Science....59
Scobey Hall....16
Sexauer Field....43
Shepard Hall....47
Solberg Hall....54
South Dakota Art Museum....24
South Dakota State University Foundation....19
Stanley J. Marshall HPER Center (Frost Arena)....80
State Court....74
State Village....75
Student Health (West Hall)....13
Sylvan Theatre....22
Tompkins Alumni Center (SDSU Alumni Association)....18
Tompkins Alumni Center Clock Tower....17
United Campus Ministeries....57
United Lutheran Center....83
University Police Department (FRMC)....15
University Relations (CMC)....52
University Stores & Services....65
University Student Union (Volstorff Ballroom, Food Service,Dept. of Student Activities, & Bookstore)....69
Veterinary Isolation Building....33
Waneta Hall....12
Wecota Annex....11
Wecota Hall....10
Wenona Hall....9
West Hall (Student Health)....13
West Headhouse & West Greenhouses....28
Wheat Commission Greenhouse....29
Woodbine Cottage (President's Residence)....14
Yeager Hall (US Post Office, Central Mail, Print Lab)....46
Young Hall....78

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