

South Dakota State University Bulletin

Graduate School 1996-1998

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

Discrimination complaints on the basis of sex, including sexual harassment complaints, should be directed to the Title IX Coordinator: Ms. Saila Gandhi, SDSU Advocacy Officer, Administration Building (AD), Room 217, Phone: 605-688-6361.

Discrimination complaints on the basis of disability should be directed to the Section 504/ADA Coordinator: Mr. Eugene T. Butler, Jr., Administration Building, Room 217, Phone: 605-688-6361 (TT/VOICE 605-688-4394).

Discrimination complaints based on other protected categories should be directed to Ms. Saila Gandhi, Advocacy Officer, Administration Building, Room 217, Phone: 605-688-6361.

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The information contained in this catalog is the most accurate available at the time of publication, but changes may become effective before the next catalog is printed. It is ultimately the student's responsibility to stay abreast of current regulations, curricula, and the status of specific programs being offered. Further, the university reserves the right, as approved by the Board of Regents, to modify requirements, curricula offerings and charges, and to add, alter, or delete courses and programs through appropriate procedures. While reasonable efforts will be made to publicize such changes, a student is encouraged to seek current information from appropriate offices.

Notice: South Dakota State University offers all educational programs, materials, and services to all people without regard to ancestry, age, race, color, creed, religion, gender, disability, national origin, sexual preference or Vietnam Era Veteran status, and is an Affirmative Action/Equal Opportunity Employer (Female/Male).

Academic Calendar

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--- Fall Semester 1996 ---

September 2, Monday	Labor Day Holiday
September 3, Tuesday	Registration and Orientation
September 4, Wednesday	Instruction Begins
September 17, Tuesday	Last Day to Drop/Add and Adjust Final Fees
September 20, Friday	Last Day to Submit a Graduation Application for Fall 1996
October 14, Monday	Native American Day Holiday
October 16, Wednesday	"W" Grade Begins
October 23, Wednesday	First Half Fall Semester Ends
October 26, Saturday	Hobo Day
October 28, Monday	Deficiency Reports Due to Registrar, Adm 208, by 5 p.m.
November 11, Monday	Veterans Day Holiday
November 13, Wednesday	Last Day to Drop a Course
November 28-29, Thursday-Friday	Thanksgiving Recess
December 13, Friday	Last Day of Classes, Fall 1996
December 14, Saturday	Graduation, 10 a.m.
December 16-20, Monday-Friday	Final Examinations
December 26, Thursday	Grades Due in Registrar's Office, 5 p.m.

--- Spring Semester 1997 ---

January 8, Wednesday	Registration and Orientation
January 9, Thursday	Instruction Begins
January 20, Monday	Martin Luther King, Jr. Day Holiday
January 23, Thursday	Last Day to Drop/Add and Adjust Final Fees
February 5, Wednesday	Last Day to Submit a Graduation Application for Spring 1997
February 17, Monday	Presidents' Day Holiday
February 24, Monday	"W" Grade Begins
March 3-7, Monday-Friday	Spring Break
March 11, Tuesday	First Half Spring Semester Ends
March 14, Friday	Deficiency Reports Due to Registrar, Adm 208, by 5 p.m.
March 28-31, Friday-Monday	Easter Recess
April 3, Thursday	Last Day to Drop a Course
May 2, Friday	Last Day of Classes, Spring 1997
May 3, Saturday	111th Annual Commencement, 10 a.m.
May 5-9, Monday-Friday	Final Examinations
May 14, Wednesday	Grades Due in Registrar's Office, 5 p.m.

--- Fall Semester 1997 ---

September 1, Monday	Labor Day Holiday
September 2, Tuesday	Registration and Orientation
September 3, Wednesday	Instruction Begins
September 16, Tuesday	Last Day to Drop/Add and Adjust Final Fees
September 19, Friday	Last Day to Submit a Graduation Application for Fall 1997
October 11, Saturday	Hobo Day
October 13, Monday	Native American Day Holiday
October 15, Wednesday	"W" Grade Begins
October 22, Wednesday	First Half Fall Semester Ends
October 27, Monday	Deficiency Reports Due to Registrar, Adm 208, by 5 p.m.
November 11, Tuesday	Veterans Day Holiday
November 12, Wednesday	Last Day to Drop a Course
November 27-28, Thursday-Friday	Thanksgiving Recess
December 12, Friday	Last Day of Classes, Fall 1997
December 13, Saturday	Graduation, 10 a.m.
December 15-19, Monday-Friday	Final Examinations
December 24, Wednesday	Grades Due in Registrar's Office, 5 p.m.

--- Spring Semester 1998 ---

January 7, Wednesday	Registration and Orientation
January 8, Thursday	Instruction Begins
January 19, Monday	Martin Luther King, Jr. Day Holiday
January 22, Thursday	Last Day to Drop/Add and Adjust Final Fees
February 4, Wednesday	Last Day to Submit a Graduation Application for Spring 1998
February 16, Monday	Presidents' Day Holiday
February 23, Monday	"W" Grade Begins
March 3, Tuesday	First Half Spring Semester Ends
March 6, Friday	Deficiency Reports Due to Registrar, Adm-208, by 5 p.m.
March 9-13, Monday-Friday	Spring Break
March 31, Tuesday	Last Day to Drop a Course
April 10-13, Friday-Monday	Easter Recess
May 1, Friday	Last Day of Classes, Spring 1998
May 2, Saturday	112th Annual Commencement, 10 a.m.
May 4-8, Monday-Friday	Final Examinations
May 13, Wednesday	Grades Due in Registrar's Office, 5 p.m.

*Fall Semesters consist of 1 registration day, 69 class days, and 5 exam days.
 *Spring Semesters consist of 1 registration day, 73 class days, and 5 exam days.

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A Message from the Dean:

This edition of the Graduate Bulletin is meant to be helpful and informative for the prospective student considering graduate work at SDSU as well as for current faculty and students.

Graduate enrollment at SDSU has shown significant growth over the past few years both in total numbers and distribution among programs. Doctoral programming has also been expanded over the past few years through addition of the Ph.D. in Chemistry, Ph.D. in Biological Sciences, and Ph.D. in Atmospheric, Environmental and Water Resources, to complement existing Ph.D. programs in Agronomy, Animal Science, Sociology and a cooperative program in Agricultural Engineering.

SDSU has over thirty masters programs representing disciplines in agriculture, engineering, humanities, health sciences, education, natural sciences and social sciences which are designed to meet contemporary needs. Graduate program development has been carefully planned to meet the needs of the state and region as well as to play a key role in economic development and stewardship of natural resources in South Dakota.

The recent addition of many excellent research-oriented faculty has strengthened our programs by providing outstanding opportunities for graduate student research and related creative activities. The faculty have been very successful in acquiring extramural funding to provide support for research and scholarly activities, thereby enhancing opportunities for graduate study throughout the university.

If you are considering graduate study, you will find SDSU to be a dynamic, comprehensive research-oriented land-grant university with a wide range of opportunities for graduate study. If you have questions not answered by this Bulletin or need other help, please call the Graduate School, (605) 688-4181.



Christopher P. Sword
*Dean of the Graduate School
and Director of Research*

Board and Council Members**--- Graduate Council ---**

- Christopher P. SwordChair; Dean of Graduate School
- Delvin DeBoerAssociate Professor of Civil and Environmental Engineering
Term expires 1997
- Doug McFarlandAssociate Professor of Animal and Range Sciences
Term expires 1997
- John TaylorProfessor of English
Term expires 1997
- Tom CheesbroughAssistant Professor of Biology and Microbiology
Term expires 1998
- Marge HeggeProfessor of Nursing
Term expires 1998
- Mary Kay HellingAssociate Professor of Human Development,
Consumer and Family Sciences
Term expires 1998
- Don EvensonProfessor of Chemistry and Biochemistry
Term expires 1999
- Doug MaloProfessor of Plant Science
Term expires 1999
- Jill SchoenAssistant Professor of Counseling and
Human Resource Development
Term expires 1999
- Steve MarquardtDean of Libraries; Professor of Library Science
Ex-officio

--- SDSU Administration ---

- Robert T. WagnerPresident;
Ph.D., South Dakota State University, 1972 *Professor of Rural Sociology*
- Carol J. PetersonVice President for Academic Affairs;
Ph.D., University of Minnesota-Minneapolis/St. Paul, 1969 *Professor of Nursing*
- Michael P. RegerVice President for Administration
Ph.D., The Ohio State University, 1983 *Assistant Professor of Education*
- Edward P. HoganAssistant Vice President for Academic Affairs;
Ph.D., Saint Louis University, 1969 *Professor of Geography*

--- College Deans ---

- Christopher P. SwordDean, Graduate School; Director of Research;
Ph.D., University of California-Los Angeles, 1959 *Professor of Microbiology*
- David BryantDean, College of Agriculture and Biological Sciences;
Ph.D., University of Arizona, 1971 *Professor of Animal and Range Sciences*
- Herbert Cheever, Jr.Dean, College of Arts and Science;
Ph.D., University of Iowa, 1967 *Professor of Political Science*
- Darrell JensenDean, College of Education and Counseling;
Ph.D., University of Iowa, 1971 *Professor of Education*
- Duane E. SanderDean, College of Engineering;
Ph.D., Iowa State University, 1964 *Professor of Electrical Engineering*
- Laurie Stenberg NicholsDean, College of Family and Consumer Sciences;
Ph.D., The Ohio State University, 1988 *Professor of Human Development,
Consumer and Family Sciences*
- Roberta OlsonDean, College of Nursing;
Ph.D., Saint Louis University, 1984 *Professor of Nursing*
- Danny LattinDean, College of Pharmacy;
Ph.D., University of Minnesota, 1970 *Professor of Medicinal Chemistry*

--- Board of Regents ---

- Honorable Robert T. (Tad) PerryPierre
Executive Director
- Honorable David GienappMadison
Term expires March 31, 2003
- Honorable Jason GloldtSpearfish
Student Regent
Term expires July 1, 1998
- Honorable Max GruenwaldMilbank
Term expires March 31, 1997
- Honorable Harvey C. Jewett, IVAberdeen
Term expires March 31, 1999
- Honorable James HansenPierre
Term expires March 31, 2001
- Honorable James HartMiller
Term expires March 31, 1998
- Honorable Pat LebrunRapid City
Term expires March 31, 1999
- Honorable Karl WegnerSioux Falls
Term expires March 31, 1998

SDSU in Review

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.

Following is listed the SDSU area noting the **accrediting boards:**

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

Agricultural, Civil, Electrical, and Mechanical Engineering Departments -- *Engineers Council for Professional Development*

Journalism Curriculum -- *American Council on Education for Journalism*

College of Nursing -- *National League for Nursing*

Chemistry Department -- *American Chemical Society*

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

Memberships include:

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

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

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

General Information

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

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

The Graduate Faculty is composed of the University President, Vice President for Academic Affairs, Vice President for Administrative Affairs, college deans, heads of departments in which graduate courses are given, and other faculty, chosen on the basis of their training and experience, in accordance with the policies of the Graduate School. All matters of policy and standards are acted on by the Graduate Faculty. In addition, Graduate Faculty are authorized to serve as adviser 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, available in the Admissions Office, Admin Bldg 200.

Admission Information

Admission to Graduate School

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

Admission Requirements

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

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

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

Application Procedure

Application Form -- A completed form supplied by the Graduate School must be submitted and accompanied by a non-refundable application fee of \$15. Students who have previously attended a state institution in South Dakota and paid the application fee are exempt from this fee. An application form is included in this Bulletin on page 135.

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 degree, the Bachelors 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 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 but must be followed by the certified degree during the first semester of graduate work.

Letters of Recommendation -- Two letters of recommendation from persons acquainted with the academic ability and professional competency of the applicant should be sent directly to the Graduate School. Forms are available with the application packet and on page 132. This requirement may be waived by the Dean of the Graduate School on recommendation of the department.

Application Procedure for International Students

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

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

Graduate Degrees Offered

Doctor of Philosophy

Agricultural Engineering
Agronomy
Animal Science
Animal and Range Sciences
Dairy Science
Atmospheric, Environmental and Water Resources
Biological Sciences, areas of study:
Animal and Range Sciences
Biology and Microbiology
Dairy Science
Plant Science
Veterinary Science
Wildlife and Fisheries Sciences
Chemistry
Sociology

Master of Arts

English

Master of Education

Curriculum and Instruction
Educational Administration

Master of Science

Agronomy
Animal Science
Biology
Chemistry
Communication Studies and Journalism
Counseling and Human Resource Development
Dairy Science
Economics
Engineering, areas of study:
Agricultural Engineering
Civil Engineering
Computer Science
Electrical Engineering
Mechanical Engineering
Physics
Entomology
Family and Consumer Sciences, areas of study:
Apparel Merchandising and Interior Design
Human Development, Consumer and Family Sciences
Nutrition and Food Sciences
Geography
Health, Physical Education and Recreation
Industrial Management
Mathematics
Microbiology
Nursing
Plant Pathology
Rural Sociology
Wildlife and Fisheries
Fisheries Option
Wildlife Option

Master of Science Teaching*

Biology
Chemistry
Mathematics
Physics

*Terminated, no new applicants accepted as of 7/1/96

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, Administration Building Room 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 immunizations for measles and 2 for rubella, signed by a doctor is required.

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

Application Process

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

Admission Status

Unconditional Admission

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

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

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

Conditional Admission

Conditional admission may be granted if:

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

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

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

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

Special Student (non-degree)

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

Change of Admission Status

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

Readmission

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

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

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

Course Numbering System

300-499 series -- Advanced undergraduate courses which may be used in meeting part of the requirements for graduate degrees in accordance with the policy on converted credit, page 106.

These courses are not listed in this bulletin, but are listed in the general catalog.

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.

Courses in the 500-599 and 600-699 series 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 for the Bachelor's degree.

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

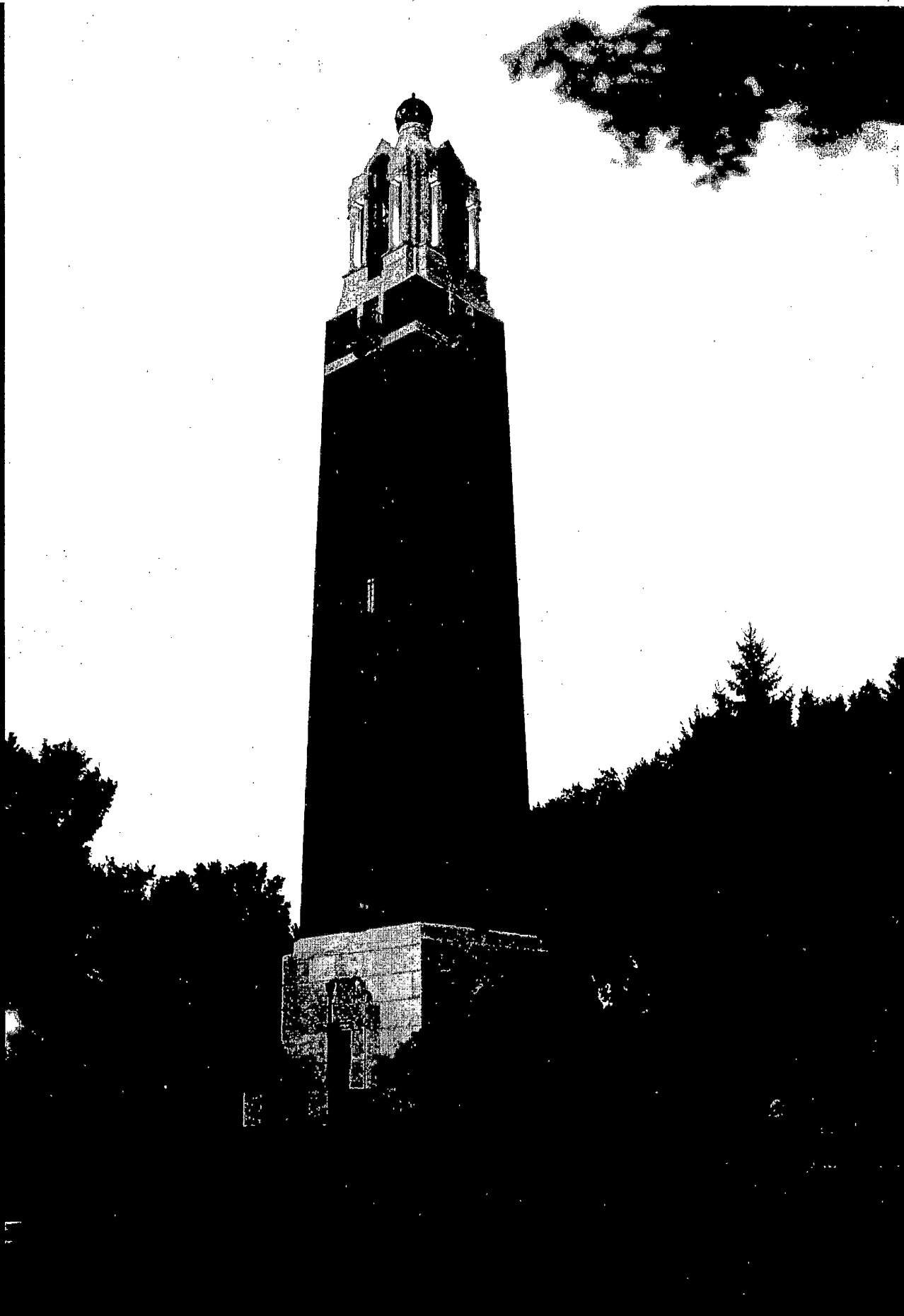
700-799 series -- Graduate level courses open only to graduate students.

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

900-999 series -- Post-baccalaureate courses not for degree credit.

Experimental Courses -- Courses ending in 97, 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.

Departments of Instruction



Department of Agricultural Engineering

Mailing address: SDSU Box 2120

Phone: 605/688-5141
 Fax: 605/688-4917

Acting Department Head: Professor Darrell W. DeBoer
 Graduate Coordinator: Professor Darrell W. DeBoer

Program Description

The Department of Agricultural Engineering offers coursework toward the Master of Science in Engineering. The M.S. in Engineering has a primary and secondary core requirement as defined in the College of Engineering section of this catalog. Areas of specialization include machine vision, bio-materials processing, soil and water engineering, structures and machine design.

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

Major Degrees Offered

- Master of Science: Agricultural Engineering (as of July 1, 1996, degree no longer available)
 Engineering, with coursework in Agricultural Engineering
- Doctor of Philosophy: Agricultural Engineering,
 cooperatively with Iowa State University

Available Options for Graduate Degrees

- Master of Science: Option A
 Option B

See page 110 for descriptions of available options.

Core Requirements

Refer to College of Engineering section, page 53, for specific details regarding Engineering, with an emphasis in Agricultural Engineering, Masters degree.

Additional Admission Requirements

- GRE: Not required
- TOEFL: Department requirement of 550

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Agricultural Engineering (AE) Course Offerings

- 503 Energy and Environment3
 F97, S99
 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.
- 512 Advanced Agricultural Tractors and Machines2
 F97, S99

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.

Graduate Faculty

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

Shu Tung Chu
 Professor
 Ph.D., University of Minnesota-
 Minneapolis/St. Paul, 1966
 Infiltration, Modeling

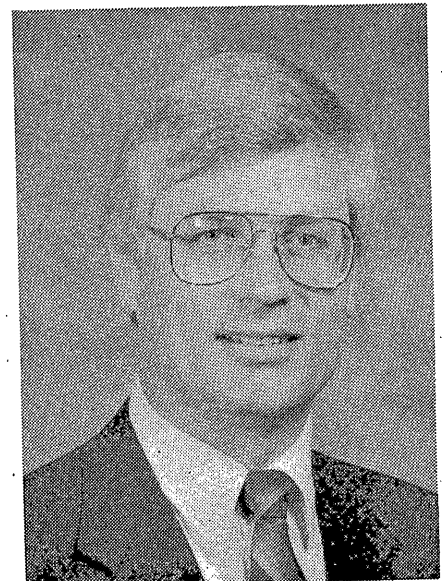
Darrell W. DeBoer
 Professor
 Ph.D., Iowa State University of Science and
 Technology, 1969
 Irrigation, Water Quality

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

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

James L. Julson
 Assistant Professor
 M.S., South Dakota State University, 1977
 Biological Materials

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



Darrell W. DeBoer, Acting Department Head
 Agricultural Engineering

Key to Course Descriptions

Course Number and NameCredits
 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.



Darrell W. DeBoer, Graduate Coordinator
 Agricultural Engineering

522 Bio-Environmental Engineering2
F97, F98
 Analysis of farm animals and their environment employing engineering principles combined with biological principles. Homeothermic mechanisms of animals and the influence of thermal environment upon growth and production. P, AE 324 or consent.

533 Advanced Irrigation Engineering3
F96, S98 (2,3)
 Basic soil-water-crop relationships. Theory and design of pumping plants, surface, sprinkler, and drip irrigation systems. P, AE 434 or consent.

544 Unit Operations of Biological Materials Processing4
S (3,2)
 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), solid-liquid separation processes (leaching), membrane separations (ultrafiltration, reverse osmosis), mechanical separation processes, extrusion. P, consent.

554 Advanced Unit Operations in Food/Biomaterial Processing4
F97, S99 (3,1)
 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 effects on food safety, freezing and refrigeration technology, high temperature short time extrusion processing, and aseptic processing. P, consent.

700-701 Seminar0-1

732 Advanced Hydrology in Agriculture2
S97, F98
 Small watershed hydrology principles. Unit hydrograph theory. Infiltration and evapotranspiration processes. Small watershed surface runoff simulation. Soil erosion principles. P, consent.

733 Ground Water Engineering in Agriculture3
F97, S99
 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.

752 Theoretical Micro-Climatology2
F97, S99
 Derivation and application of physical laws to air layer near the ground occupied by plants and animals. Instruments used to take measurements in layer near ground. P, Calculus, Physics, AE 353 or consent.

763 Instrumentation3
S (2,3)
 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.

770 Special Problems in Agricultural Engineering(on demand) 1-2
 Graduate students who wish to pursue detailed studies in one or several areas of the Agricultural Engineering field including meteorology and climatology.

771 Graduate Seminar1
F
 Discussion and reports of current topics and investigations in Agricultural Engineering. (Limit of 2 credits.)

772 Similitude2
S97, F98 (1,2)
 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.

73 Programming Agricultural Systems3
F96, S98 (2,2)
 The use of programs and computers in advanced engineering for the solution of problems occurring in Agricultural Engineering studies. Gathering, processing, evaluating mass engineering and scientific data. P, BASIC or FORTRAN.

790 Thesis, MS1-7

791 Thesis Sustaining, MS0

792 Research Report/Design Paper(on demand) 2

793 Research Report/Design Paper Sustaining0

795 Special Topics(on demand) 1-3

890 Dissertation, PhD1-12

891 Dissertation Sustaining, PhD0

Agricultural Systems Technology (AST) Course Offerings

512 Advanced Farm Machinery2
Su, even years (1,3)
 Operation, care, adjustment, new developments in farm machinery, with emphasis on field and farm machinery as related to needs of agricultural production.

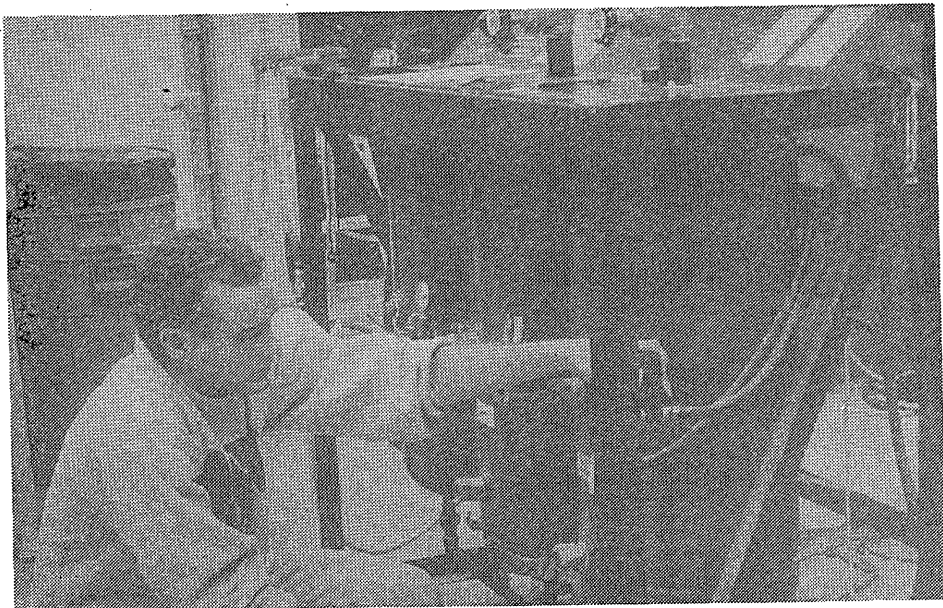
522 Advanced Farm Structures2
Su, even years (1,3)
 Materials for farm construction, construction methods and techniques, new developments in farm building.

562 Advanced Irrigation Mechanics and Practices2
Su, odd years (1,3)
 Sprinkler, surface and trickle irrigation systems and equipment. Irrigation scheduling, management, and economics. Water laws and irrigation program financing. Water quality and environmental impact of irrigation.

582 Advanced Farm Engines2
Su, odd years (1,3)
 Operation, selection, care, adjustment, and new development of internal combustion engines as applied to farm power units.

792 Special Problems1-3

793 Special Topics1-4



Department of Animal and Range Sciences

Graduate Faculty

Carl P. Birkelo
Associate Professor
Ph.D., Colorado State University, 1988
Ruminant Nutrition

David A. Bryant
Professor
Ph.D., University of Arizona, 1971
Range Science

W. J. Costello
Distinguished Professor
Ph.D., Oklahoma State University, 1963
Meat Science

F. Robert Gartner
Professor
Ph.D., University of Wyoming, 1967
Range Science

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

George W. Libal
Professor
Ph.D., South Dakota State University, 1974
Swine Nutrition

James R. Males
Professor
Ph.D., The Ohio State University, 1973
Ruminant Nutrition

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

Douglas C. McFarland
Associate 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
Associate Professor
Ph.D., Kansas State University of Agriculture
and Applied Science, 1983
Cow-Calf Management

John Romans
Professor
Ph.D., South Dakota State University, 1967
Meat Science

Mailing address: SDSU Box 2170

Phone: 605/688-5166

Department Head: Professor James Males
Graduate Coordinator: Professor James Males

Program Description

The Department of Animal and Range Sciences offers graduate programs leading to the Master of Science and Doctor of Philosophy degrees in Animal Science or the Doctor of Philosophy degree in Biological Sciences. Faculty and graduate students are actively involved in basic and/or applied research in the fields of nutrition, reproductive physiology, muscle biology, range science, animal breeding, meat science and animal production.

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

Major Degrees Offered

Master of Science: Animal Science

Doctor of Philosophy: Animal Science
Biological Sciences, with an area of study in Animal and Range Sciences

Available Options for Graduate Degrees

Master of Science: Option A

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

See pages 110 (M.S.) and 113 (Ph.D.) for descriptions of available options.

Core Requirements

M.S. students required to have 1 credit of Graduate Seminar.

Ph.D. students required to have 2 credits of Graduate Seminar.

All students required to present seminar on thesis or dissertation.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

Introductory Animal Science, plus 9 other credits of Animal Science

The department requires applicants to submit a current resume and a letter of application that outlines interests and goals in addition to materials required by the Graduate School.

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Animal Science (AS) Course Offerings

591 Research Problems	1-3
Investigation of problems in the following areas with results submitted as a technical paper: Animal Breeding, Nutrition, Meats, Livestock Production, Range Science, Reproductive Physiology, Wool Technology, Poultry. Maximum of 3 credits for student program.	
592 Special Topics	1-6
Advanced study of one or more selected topics: breeding, management, product technology, physiology, nutrition, research methods or marketing.	
711 Ruminology	3
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.	

F, odd years

72 Ruminant Nutrition	3
<i>S, even years</i>	
Principles of nutrition for ruminants in relation to growth, reproduction and lactation. P, AS 233, AS 323, Chem 361, Vet 223 or Zool 325.	
73 Population Genetics	3
<i>S, odd years</i>	
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.	
731 Experimental Procedure	2
<i>S, even years</i>	
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.	
732 Advanced Physiology of Reproduction	3
<i>S, even years (2,2)</i>	
Anatomical and physiological process of reproduction in domestic animals with special emphasis on research techniques and the findings of recent research. P, AS 433.	
733 Vitamins and Minerals	3
<i>S, odd years</i>	
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.	
734 Protein and Energy Nutrition	3
<i>S, odd years</i>	
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.	
736 Monogastric Nutrition	3
<i>F, even years</i>	
Nutrition principles for nonruminants related to reproduction, lactation and growth. P, AS 233, AS 323, Chem 361, Vet 223 or Zool 325.	
750 Animal Growth and Development	3
<i>S, even years</i>	
Growth of animals at the cellular level, including hormones, growth factors, receptors and signalling and growth at the whole animal level.	
753 Meat Science	3
<i>F, odd years (2,2)</i>	
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.	
781 Graduate Seminar	1
<i>F</i>	
Reports and discussion of current research in animal science. Maximum of two credits for M.S. and four credits for Ph.D.	
790 Thesis, MS	1-7
791 Thesis Sustaining, MS	0
890 Dissertation, PhD	1-12
891 Dissertation Sustaining, PhD	0

Range Science (Rang) Course Offerings

591 Research Problems in Range Science	1-3
Investigation of problems in Range Science with results submitted as a technical paper.	
592 Special Topics	1-3
Advanced study of one or more selected topics in Range Science.	

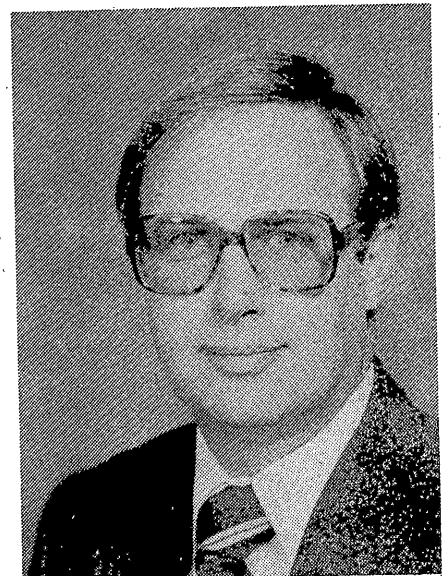
Arthur Lowell Slyter
 Professor
 Ph.D., Kansas State University of Agriculture
 and Applied Science, 1969
 Reproductive Physiology/Sheep Management

Key to Course Descriptions

Course Number and NameCredits
 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.



James Males, Department Head
 Animal and Range Sciences

Department of Apparel Merchandising and Interior Design

Graduate Faculty

Sandra Evers
Professor
Ph.D., Michigan State University, 1976
Interior Design

Mailing address: SDSU Box 2275A

Phone: 605/688-5196

Department Head: Professor Sandra Evers
Graduate Coordinator: Professor Sandra Evers

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.

Major Degrees Offered

Master of Science: Family and Consumer Sciences, with supporting courses in Apparel Merchandising or Interior Design

Doctor of Philosophy: Not available

Refer to College of Family and Consumer Sciences section, page 58, for specific details.

Apparel Merchandising (AM) Course Offerings

580 Travel Studies1-5

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.

592 Special Problems1-3

Problems for independent study selected according to special interests and needs. Arranged by contract with instructor.

593 Current Topics1-3

Discussion of current literature and issues. Investigation of topics for which there is a current need but are not part of any class. P, consent.

673 Costumes and Textiles Through the Ages3

A survey of the evolution of apparel arts from ancient to modern times emphasizing aesthetic, social, political and economic factors affecting dress and mores expressed through dress in each culture.

770 Seminar in Apparel Merchandising and Textiles1-2

Reports and discussion of current literature in various areas of apparel merchandising and interior design. Cross-listed with ID 770.

792 Special Problems1-3

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

573 Travel Studies1-5

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.

592 Special Problems1-3

Problems for independent study selected according to special interests and needs. Arranged by contract with instructor.

593 Current Topics1-3

Discussion of current literature and issues. Investigation of topics for which there is a current need but not part of any class. P, consent.



Sandra Evers, Graduate Coordinator
Apparel Merchandising and Interior Design

- 770 Seminar in Interior Design and Housing**1-2
Reports and discussion of current literature in various areas of interior design and housing. Cross-listed with AM 770.
- 792 Special Problems**1-3
Problems for advanced study selected according to student's specific interests, needs, or current research with which student is familiar. Credit arranged by professor in charge. Can be repeated.
- 793 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.

Key to Course Descriptions

Course Number and 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 of Biology and Microbiology

Graduate Faculty

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

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

Melvin R. Duvall
Assistant Professor
Ph.D., University of Minnesota/St. Paul, 1987
Molecular Evolution

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

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

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

Lois Haertel
Professor
Ph.D., Oregon State University, 1969
Aquatic Ecology

Michael Hildreth
Associate Professor
Ph.D., Tulane University of Louisiana, 1983
Parasitology

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

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

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

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

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

Mailing address: SDSU Box 2207BPhone: 605/688-6141

Department Head: Professor Charles R. McMullen
Graduate Coordinator: Professor Carl A. Westby

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.

Major Degrees Offered

Master of Science: Biology
Options in Biology, Botany, and Zoology
Microbiology

Master of Science Teaching (MST): Biology (as of 7/1/96, program discontinued)

Doctor of Philosophy: Biological Sciences, with an area of study in Biology/Microbiology

Available Options for Graduate Degrees

Master of Science: Option A (Microbiology)
Option B
Option C (M.S.T.) (as of July 1, 1996, no new students)

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

See pages 110 (M.S.) and 113 (Ph.D.) for descriptions of available options.

Core Requirements

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

Additional Admission Requirements

GRE: Required by all applicants.
TOEFL: Graduate School requirement of 525

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

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Biology (Bio) Course Offerings

515 Mycology	3
	<i>F, odd years (2,3)</i>
Comprehensive taxonomic survey of the Kingdom Fungi, reproductive biology, physiology, genetics, and ecology of fungal organisms; relationship of fungi to human affairs. Cross-listed with PS 515.	
525 Biology of Aging	3
	<i>F</i>
Physical, sensory, and physiological changes with age. Aging of cells and tissues. Cellular, developmental, endocrine and other theories of aging. Pathologies of aging. P, undergraduate physiology course.	
545 Histological Techniques	3
	<i>S (2,3)</i>
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.	

553 Advanced Genetics3
F, even years
 Procedures in genetic studies as they relate to molecular and classical genetic applications. Cross-listed with PS 553. P, Bio 371.

562 Prokaryotic-Eucaryotic Molecular Biology I2
F
 Charge, partitioning migration of molecules; protein structure, enzymes; DNA structure and properties, prokaryotic 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. P, Micr 436, Chem 361, or consent. Cross-listed with PS 562.

563 Prokaryotic-Eucaryotic Molecular Biology I Laboratory2
F (0,6)
 Isolation of plasmids; restriction analyses; DNA transfers and hybridization analyses; transformations of prokaryotic cells; amplification of DNA utilizing polymerase chain reactions (PCR); restriction fragment length polymorphism (RFLP) analyses; mRNA isolation; generation and amplification of bacteriophage cDNA libraries. P, Micr 436, Chem 361, or consent. Cross-listed with PS 563.

564 Prokaryotic-Eucaryotic Molecular Biology II2
S
 Structure of the nucleus; endocytosis; genome of mitochondria and chloroplasts; cell growth and division; cancer; immune system; pattern formation; homeoboxes; intracellular transport; gene expression and regulation. P, Bio/PS 562 or consent. Cross-listed with PS 564.

565 Prokaryotic-Eucaryotic Molecular Biology II Laboratory2
S (0,6)
 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/PS 562, 563, or consent. Cross-listed with PS 565.

597 Special Topics1-5
 Field Ecology, Human Ecology, Mammalian Developmental Genetics.

740 Metabolic Responses to Environmental Stress3
F, even years
 Mechanism by which plants and animals respond to environmental stress at the molecular level. P, Bio 343 and Chem 361 or Micr 436.

751 Biology of Algae4
F, odd years (2,6)
 Physiology, ecology, taxonomy and evolution of algae. Laboratory includes identification and field and laboratory techniques. P, two years of biological science and one year of chemistry or consent.

762 Eukaryotic Molecular Biology Laboratory1
S (0,3)
 Methods for detection and analysis of gene regulation in eukaryotes. Must be taken concurrently with Bio 562. P, Bio 343 or Bio 371 and Chem 361 or Micr 436.

773 Cytogenetics3
F, odd years (2,3)
 A comprehensive study of genetic mechanisms that direct and regulate fundamental processes of animal and plant (eukaryote) development. Topics of discussion include but are not limited to: (1) Nature of eukaryote DNA as distinguished from prokaryote DNA, (2) Transcription, RNA processing, and post-translational modifications unique to developmental aspects of eucaryotes, (3) Molecular strategies of development. Cross-listed with PS 773. P, Bio 343, Bio 371, Zool 383, Micr 436 or equivalent of above.

780 Developmental Genetics3
S
 A comprehensive study of genetic mechanisms that direct and regulate fundamental processes of animal development. Topics of discussion include but are not limited to: (1) Nature of DNA and techniques of DNA analysis, (2) Transcription, and RNA processing, and (3) Molecular strategies of development in nematodea (*C.elegans*), *Drosophila*, and the mouse (*Mus musculus*). P, Bio 343, Bio 371, Zool 383, Micr 436 or equivalent of the above or consent of the instructor.

782 Special Problems1-4
 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.

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

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

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

Christopher P. Sword
 Professor
 Ph.D., University of California-Los Angeles, 1959
 Medical Microbiology

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

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

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

Joint Appointments

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

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

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

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

Anne Fennell
 Assistant 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
 Ph.D., Oregon State University, 1966
 Food Safety

Paul Johnson
 Assistant Professor of Plant Science
 Ph.D., University of Wisconsin-Madison,
 1992

Insect Systematics

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

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



Charles R. McMullen, Department Head
 Biology and Microbiology

790 Thesis, MS	1-7
791 Thesis Sustaining, MS	0
792 Graduate Seminar	1
793 Biological Research Problems	1-3
Bio S 890 Dissertation, PhD	1-7
Bio S 891 Dissertation Sustaining, PhD	0
Bio S 892 PhD Seminar	1

Botany (Bot) Course Offerings

512 Morphology of Non-Vascular Plants	3
Morphology has been defined as philosophical anatomy. This course will address comparable features of different plant forms in light of biological descent and consequent relationships. Non-vascular morphology (Bot 512) surveys diversities in the bacteria, algae, fungi, mosses and liverworts. To gain insight into and unity from homeostasis and diversity through evolution. May be taken for variable credit depending upon groups surveyed.	
513 Morphology of Vascular Plants	3
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.	
705 Aquatic Plants	3
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.	
715 Advanced Plant Ecology	4
Analysis of the energy relationships of communities with emphasis on productivity. Literature readings. Laboratory work in techniques of community analysis. P, consent.	
727 Advanced Plant Physiology	4
Role of organic and inorganic compounds in plant nutrition. Emphasis on photosynthesis, respiration, metabolism, and other cellular processes. P, Bot 327, Chem 120.	
730 Plant Molecular Biology	3
Molecular mechanisms involved in regulation of subcellular assemblies and metabolism in higher plants. P, Bio 343 and Chem 361 or Micr 436.	
781 Plant Tissue Culture	3
Comparative studies in in vivo and in vitro cellular differentiation, organ formation, and plant development. P, Bot 421 or Bio 371 or Bot 327.	
782 Special Problems	1-4
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.	
785 Growth and Development	4
Relations of light, temperature, water, wind, growth regulators, nutrients and other factors to various stages of plant growth and development. P, Bot 327, Chem 120.	
797 Special Topics	1-5

Microbiology (Micr) Course Offerings

524 Medical and Veterinary Virology	4
Basic course discussing the characterization, structure, and replication of viruses and the pathogenesis of viral disease in man and animals. Laboratory exercises emphasize techniques in virus isolation, characterization, and detection by immunological assays. P, Micr 422 or consent. Cross-listed with Vet 524.	

537 Systematic Bacteriology4
F, even years (2,4)
 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.

597 Advances in Microbiology1-4
S
 In-depth study of selected areas of specialties within Microbiology to strengthen and expand the current knowledge and technical skills of graduate students in Microbiology. Prerequisites will vary with area studied. P, Micr 231, consent.

713 Industrial Microbiology4
F (2,4)
 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.

722 The Molecular and Cellular Biology of the Immune Response3
S, even years
 An in-depth examination of the molecular and cellular basis of immune function and regulation.

726 The Cell Physiology of Signal Transduction - a perspective using leukocyte models3
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.

738 Microbial Metabolism4
S (2,4)
 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.

742 Graduate Seminar1

782 Microbiology Problem1-4
 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.

790 Thesis, MS1-7

791 Thesis Sustaining, MS0

Zoology (Zool) Course Offerings

782 Special Problems1-4
 Independent study in specialized area of zoology. Objectives, scope of work and plan of study specified by professor and student(s). P, consent of instructor and department.

797 Special Topics in Zoology1-5
 Special Topics are taught as regular courses dependent upon student demand. Information about content, prerequisites and semester offered can be obtained from the department.

Adjunct Faculty

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

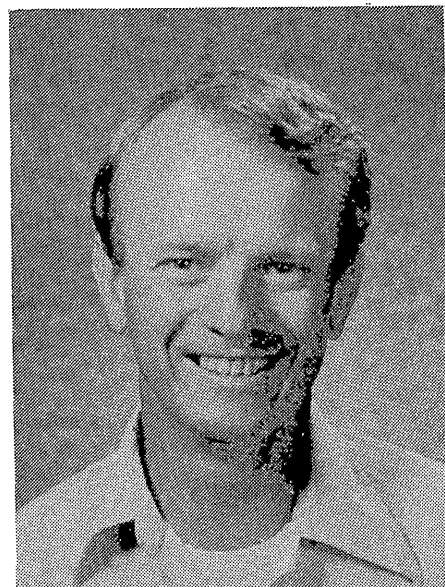
Carolyn Hull Sieg
 Assistant Professor of Biology and
 Microbiology
 Ph.D., Texas Tech University, 1991
 Fire Ecology

Key to Course Descriptions

Course Number and NameCredits
 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.



Carl A. Westby, Graduate Coordinator
 Biology and Microbiology

Department of Chemistry and Biochemistry

Graduate Faculty

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

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

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

Henry Gehrke, Jr.
Professor
Ph.D., University of Iowa, 1964
Inorganic Chemistry

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

Harry G. Hecht
Professor
Ph.D., University of Utah, 1962
Physical Chemistry

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

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

David E. Lewis
Professor
Ph.D., University of Adelaide, 1980
Organic 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

Ioan S. Palmer
Professor
Ph.D., Pennsylvania State University, 1960
Biochemistry

Laurence I. Peterson
Professor
Ph.D., Yale University, 1963
Industrial Organic Chemistry

Mailing address: SDSU Box 2202

Phone: 605/688-5151

Fax: 605/688-6364

Department Head: Professor Laurence I. Peterson
Graduate Coordinator: Professor James A. Rice

Program Description

The research and instructional programs of the Department cover a wide range of topics. Currently active research projects in the Department focus on various aspects of 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: a solution FT-NMR spectrometer; high-resolution solid-state NMR, a high-resolution magnetic sector mass spectrometer with EI and CI sources and GC, HPLC, pyrolysis and fast-atom bombardment capabilities; a FT-IR spectrometer with far-IR capabilities; near-IR reflectance scanning spectrophotometer; 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 through terminals in the Department. Individual groups maintain their own computer systems for molecular modeling, word processing or dedicated data manipulation.

Major Degrees Offered

Master of Science: Chemistry

Master of Science Teaching (MST): Chemistry (degree has been discontinued as of July 1, 1996)

Doctor of Philosophy: Chemistry

Available Options for Graduate Degrees

Master of Science: Option A
Option C (M.S.T.) (as of July 1, 1996, no new students)

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

See pages 110 (M.S.) and 113 (Ph.D.) for descriptions of available options.

Core Requirements

Master of Science:
(3 of the 5 courses listed)

Chem 622	Advanced Organic Chemistry I	.....3
Chem 632	Advanced Analytical Chemistry	.....3
Chem 642	Advanced Physical Chemistry	.....3
Chem 654	Advanced Inorganic Chemistry	.....3
Chem 662	Principles of Biochemistry	.....3

Doctor of Philosophy:

Chem 616	Chemical Literature	.....3
Chem 622	Advanced Organic Chemistry I	.....3
Chem 632	Advanced Analytical Chemistry	.....3
Chem 642	Advanced Physical Chemistry	.....3
Chem 654	Advanced Inorganic Chemistry	.....3
Chem 662	Principles of Biochemistry	.....3

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 580

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Chemistry (Chem) Course Offerings

616 Chemical Literature	3
	S
The course will present methods of searching the chemical literature including patents and government documents. Emphasis is placed on both traditional and computer assisted literature search procedures.	
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.	
632 Advanced Analytical Chemistry	3
	S
Theoretical treatment of principles involved in noninstrumental analytical chemistry including sampling and statistics. P, Chem 344.	
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.	
654 Advanced Inorganic Chemistry	3
	F
Inorganic systems including theoretical, representative group and transition metal topics. P, Chem 344 or Chem 352.	
662 Principles of Biochemistry	3
	F
Chemistry of biological processes occurring in plants and animals. P, Chem 361.	
691 Special Problems*	(0,*)
	FS
P, consent, Limited to a total of 4 credits.	
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.	
722 Synthesis of Natural Products	3
Synthetic strategies in pathways for the formation of natural products P, Chem 328.	
724 Structural Determination of Organic Compounds	3
	(2,3)
Determination of the structure of organic compounds primarily by spectroscopic techniques P, Chem 328. Alternate years.	
725 Polymer Chemistry	4
	(3,3)
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.	
726 Advanced Organic Chemistry II	3
Physical organic, reaction mechanisms, M.O. calculations, orbital symmetry, and E.S.R. spectroscopy. P, Chem 328 and Chem 344. Alternate years.	
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 224, Chem 662.	

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

Rolland R. Rue
Professor
Ph.D., Iowa State University of Science and
Technology, 1962
Physical Chemistry

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

Leo H. Spinar
Professor
Ph.D., University of Wisconsin-Madison, 1958
Physical Chemistry

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

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

Joint Appointment

Joel E. Houghlum
Professor of Pharmaceutical Sciences
Ph.D., University of Wisconsin, 1979
Analytical Chemistry

Courtesy Faculty Appointments

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

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

Adjunct Faculty Appointments

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

Key to Course Descriptions

Course Number and NameCredits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

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

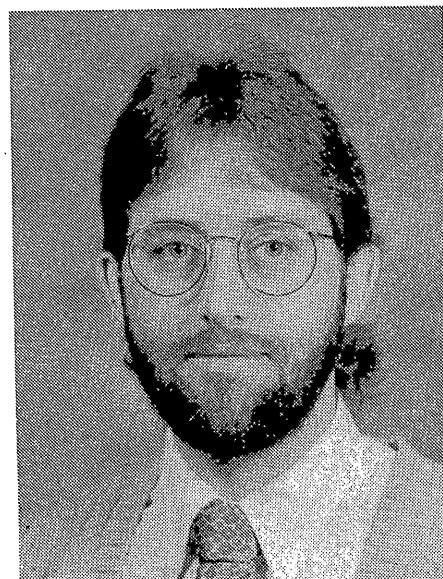
Course Description as written by department and approved by the Board of Regents. P = Prerequisite.



Laurence I. Peterson, Department Head
 Chemistry

- 730 Special Topics in Analytical Chemistry**1-6
 Individualized studies in mass spectrometry, electroanalytical, trace analysis, or instrumentation and electronics, P, consent.
- 732 Analytical Agricultural and Environmental Chemistry**4
 (3,3)
 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.
- 734 Analytical Spectroscopy**3
 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. Alternate years.
- 736 Chromatography and Separations**3
 Theory and practice of solvent extraction and paper, thin layer, gas and liquid chromatographic techniques. P, Chem 232. Alternate years.
- 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.
- 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.
- 741 Quantum Chemistry I**3
 The application of wave mechanics to simple atomic and molecular systems, properties of wave functions, and approximate methods. P, Chem 642, Math 321. Triennial years.
- 742 Quantum Chemistry II**3
 Continuation of Chem 741. P, Chem 741. Triennial years.
- 744 Chemical Thermodynamics**3
 Discussion of the laws and theories of classical and statistical thermodynamics as related to macroscopic chemical systems. P, Chem 344. Alternate years.
- 745 Statistical Thermodynamics**3
 Fundamental principles of statistical thermodynamics with applications to chemical systems. P, Chem 642, Chem 744. Triennial years.
- 746 Atomic and Molecular Structure**3
 Introduction to quantum mechanics and theoretical treatment of chemical structure and binding. P, Chem 328, Chem 344, or concurrent registration in Chem 344. Alternate years.
- 748 Chemical Kinetics**3
 Experimental methods and theoretical approaches to the study of reaction rates. P, Chem 328, Chem 344. Triennial years.
- 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.
- 752 Descriptive Inorganic Chemistry**3
 (2,3)
 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. Alternate years.
- 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.

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.	
760 Special Topics in Biochemistry	1-6
Selected concepts covering the more advanced concepts in the biochemistry field, new research techniques, etc. P, consent.	
764 Biochemistry I	3
Study of metabolism of carbohydrates and lipids. Includes aspects of enzyme kinetics and regulation as well as principles and characteristics of ATP-synthesizing complexes. P, Chem 662. Alternate years.	
766 Biochemistry II	3
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. Alternate years.	
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.	
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.	
769 Nutritional Biochemistry	3
Study of the biochemistry of systems that are significant in nutrition including metabolism, requirements and deficiencies.	
772-773 Seminar	1
Required of all graduate majors in chemistry.	
781 Bioinorganic Chemistry	3
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. Alternate years.	
782 Radioisotope Techniques	4
	<i>S</i> (3,3)
Theory and measurement of radioactivity. Techniques for the application of radioactive isotopes in chemical and biological experimentation. P, consent.	
790 Thesis, MS	1-7
791 Thesis Sustaining, MS	0
890 Dissertation, PhD	1-12
891 Dissertation Sustaining, PhD	0
The following Physics courses may be used in the graduate major plan of study. See complete descriptions under Department of Physics.	
Phys 637 Science of Solids	3
Phys 743 Statistical Mechanics	2
Phys 775 Tensors and General Relativity	3
Phys 779 Group Theory in Quantum Mechanics	3



James A. Rice, Graduate Coordinator
Chemistry

Department of Civil and Environmental Engineering

Graduate Faculty

Delvin DeBoer
Associate Professor
Ph.D., Iowa State University of Science and
Technology, 1990
Environmental Engineering

Nadim Hassoun
Professor
Ph.D., University of Michigan-Ann Arbor,
1968
Structural Engineering

Paul L. Koepsell
Professor
Ph.D., Oklahoma State University, 1965
Structural Engineering

Dwayne A. Rollag
Professor
Ph.D., Purdue University, 1975
Environmental Engineering

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

John C. Tracy
Associate Professor
Ph.D., University of California-Davis, 1989
Water Resources/Hydraulics

Mailing address: SDSU Box 2219

Phone: 605/688-5427

Fax: 605/688-5878

Department Head: Professor Dwayne Rollag
Graduate Coordinator: Professor Dwayne Rollag

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.

Major Degrees Offered

Master of Science: Engineering, with coursework in Civil Engineering

Doctor of Philosophy: Not available

Core Requirements

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

Additional Admission Requirements

GRE: Not required

TOEFL: Civil and Environmental Engineering requirement of 525

Refer to College of Engineering section, page 53, for specific details.

Civil and Environmental Engineering (CEE) Course Offerings

511 Bituminous Materials	3
	<i>F (2,3)</i>
Properties of bituminous materials including their compatibility with various types of aggregates. Asphalt mixes are designed and tested. Standard tests are performed on bituminous materials with emphasis on test results. Asphalt surface evaluation techniques. P, CEE 216. Alternate years.	
524 Industrial Waste Treatment	2
	<i>S</i>
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.	
527 Environmental Engineering Instrumentation	3
	<i>F (1,6)</i>
Analysis of water and waste water samples, using environmental laboratory instrumentation. Design of treatment facility process instrumentation and controls. P, CEE 423 or consent.	
528 Solid Waste Engineering and Management	3
	<i>S (2,3)</i>
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.	
535 Water Resources Engineering	3
	<i>S</i>
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.	

536 Foundation Engineering3
S (2,3)
 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.

543 Matrix Analysis of Structures.....3
F
 Theory and application of matrix methods in structural analysis. P, CEE 353.

544 Precast Concrete Structures3
 Advantages of precast concrete. Structural and architectural precast elements. Building systems. Design concepts and structural design. Connections, specifications, and detailing. P, CEE 456. Alternate years.

547 Advanced Soils Engineering3
S (2,3)
 Application to engineering problems. Stability, compaction, embankments, seepage, draining, and stabilization. P, CEE 446. Alternate years.

552 Prestressed Concrete3
F
 Theory and design of prestressed concrete including pre-tensioning and post-tensioning. P, CEE 456. Alternate years.

559 Advanced Structural Mechanics3
S (2,3)
 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. Alternate years.

593 Special Topics.....1-3
 P, consent.

623 Advanced Sanitary Engineering3
 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. Alternate years.

625 Environmental Engineering Planning3
S
 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. Alternate years.

632 Advanced Foundation Engineering.....3
S (2,3)
 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. Alternate years.

633 Open Channel Hydraulics3
S
 Energy and momentum principles in open channel flow, flow resistance, flow in uniform and non-uniform channels, flood routing, P, CEE 433. Alternate years.

634 Fluvial Hydraulics3
S
 Erosion, transportation and deposition of sediments by flowing water, bed load and suspended load movement, river behavior and control. P, CEE 433. Alternate years.

Key to Course Descriptions

Course Number and NameCredits
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.



Dwayne Rollag, Department Head
 Civil and Environmental Engineering

639 Geotechnical Testing Laboratory	3
	(1,6)
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. Alternate years.	
654 Advanced Design of Steel Structures	3
	S
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. Alternate years.	
656 Advanced Reinforced Concrete Design	3
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. Alternate years.	
664 Highway Capacity Analysis	3
	S(2,3)
Sizing road segments in terms of number of lanes based on traffic volume and level of service. Eliminating traffic conflict on road sections and intersections. Vehicle and pedestrian analysis. P, CEE 467. Alternate years.	
693 Special Topics	1-3
700-701 Seminar	0-1
Current, state-of-the-art, topics in civil engineering.	
721 Environmental Engineering	3
The relationship of man's environment to health and control of this environment from an engineering standpoint. P, consent. Alternate years.	
722 Hazardous and Toxic Waste Disposal	3
	(2,3)
Legislation, regulation, business aspects and technology related to the management and disposal of hazardous and toxic wastes. P, consent. Alternate years.	
724 Land Treatment of Wastes	3
	Su(2,3)
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. Alternate years.	
725 Biological Principles of Environmental Engineering	3
	F(2,3)
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.	
726 Physical/Chemical Principles in Environmental Engineering	3
	S(2,3)
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.	
727 Water Treatment Plant Design	3
	F(1,6)
Water supply sources, design of treatment plants, cost estimates of water supply systems. P, CEE 327 or consent. Alternate years.	
728 Waste Water Treatment Plant Design	3
	F(1,6)
Design of waste collection and disposal facilities, waste treatment plants, cost estimates of waste disposal and treatment systems. P, CEE 423; graduate standing. Alternate years.	

733 Advanced Water Resources Engineering	3
	<i>S</i>
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. Alternate years.	
734 Surface Water Quality Modeling	3
Modeling advective and dispersive mass transport in surface and engineered water systems. Analysis of reactions affecting the fate of dissolved oxygen, nutrients, toxic compounds and pathogens. Analytical and numerical solutions to deterministic modeling equations. Application and use of the QUALI-III and EPANET models. P, CEE 423, Math 321. Alternate years.	
737 Hydraulic Design	3
	<i>F</i>
Hydraulic design as applied to hydroelectric power development and turbine design, flood routing in reservoirs and natural channels, design of drainage structures, and energy dissipators. P, CEE 433; graduate standing. Alternate years.	
738 Advanced Hydraulics	3
	<i>S (2,3)</i>
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. Alternate years.	
749 Structural Dynamics	3
	<i>F</i>
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. Alternate years.	
756 Reinforced Masonry Design	3
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. Alternate years.	
762 Pavement Management and Rehabilitation	3
	<i>S (2,3)</i>
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. Alternate years.	
765 Pavement Design	3
	<i>S (2,3)</i>
Stresses in and design of flexible and rigid pavements including subgrades, bases and sub-bases. P, CEE 363. Alternate years.	
769 Design of Steel and Concrete Bridges	3
Determination of bridge loadings and bearings. Design of concrete and steel bridge systems. Specifications and detailing related to bridge. P, CEE 455, CEE 456. Alternate years.	
770 Engineering Research or Design Paper	2
Conduct a research or design project and write a report on the work done using thesis format.	
790 Thesis, MS	1-7
791 Thesis Sustaining, MS	0
792 Special Engineering Problems	1-3
793 Special Topics	1-3
795 Engineering Research or Design Paper Sustaining	0
797 Research	1-9

Department of Communication Studies and Theatre

Graduate Faculty

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

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

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

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

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

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

Mailing address: SDSU Box 2120

Phone: 605/688-6131

Department Head: Professor Michael Schliessmann
Graduate Coordinator: Professor Jerry Jorgensen

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.

Major Degrees Offered

Master of Science: Communication Studies and Journalism
(See also Journalism)

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Science: Option I: Communication Studies
Option II: Journalism

Option Descriptions

Option I: 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.

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

See page 110 for descriptions of available options.

Core Requirements

RTVF 792, Research Methods in Communication (taken by second semester)
SPCM 700, Instructional Communications (for Graduate Teaching Assistants)
GCom 605, Current Approaches to Communication

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525

Master of Science: Minimum of 20 semester hours of undergraduate credit in
Speech, Theatre, Journalism, or Communication.

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

General Communication (GCom) Course Offerings

605 Current Approaches to Communication	3
Major theories of communication, including media and interpersonal communication.	^s
793 Special Topics in Communication	1-3

Radio, Television, and Film (RTVF) Course Offerings

537 Educational and Corporate Television	3
Educational broadcasting with practical work in preparation and presentation of educational and instructional materials for radio, television, and film and their use in the classroom. Cross-listed with MCom 537.	<i>on demand</i>



*Michael Schliessmann, Department Head
Communication Studies and Theatre*

564 Film Studies3
 Film art forms, artists, and critics. Viewing and making films. Emphasis on major film theories. Alternate years.

762 Special Problems in Radio, TV, or Film1-2

792 Research Methods in Communications.....3
 Research Methods in Communication under Department of Journalism and Mass Communication.

Speech Communication (SpCm) Course Offerings

516 Rhetorical Criticism3
FSu
 Critical evaluation of American speakers from Colonial to contemporary. P, consent. Alternate years.

552 General Semantics3
F
 Relations between symbols; human behavior in reaction to symbols including unconscious attitudes, linguistic assumptions; and the objective systematization of language. Cross-listed with Ling 552. Alternate years.

700 Instructional Methods in Communication3
 Problems and issues in teaching the basic communication course, development of communication courses, and issues relevant to communication education.

707 Speech/English/Drama for Teachers1-3
 Designed to help teachers develop curriculum materials and curricular/co-curricular instruction of literature and drama.

766 Rhetorical Theory3
F
 Historical development of rhetorical theory from classical to modern times. Alternate years.

790 Thesis, MA1-7

791 Thesis Sustaining, MA0

792 Special Problems in Oral Interpretation1-2
 Directed research. May be repeated to a total of 4 credits in problems courses. P, consent.

794 Special Problems in Public Address1-2
 Directed research. May be repeated to a total of 4 credits in problems courses. P, consent.

Theatre (Thea) Course Offerings

510 Dramatic Literature3
F
 Analysis of important drama through present day. Alternate years.

560 History of Theatre3
S
 Periods, theatres, and representative dramatic literature from classical to present day. Alternate years.

792 Special Problems1-2
 Directed research; may be repeated to total of 4 credits in problems courses. P, consent.

Key to Course Descriptions

Course Number and NameCredits
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.



*Laurie Haleta, Graduate Coordinator
 Communication Studies and Theatre*

Department of Computer Science

Graduate Faculty

Gerald Bergum
 Professor
 Ph.D., Washington State University, 1969
 Numerical Analysis

Bin Cong
 Associate Professor
 Ph.D., University of Texas, 1991
 Parallel Processing and Networking

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

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

Mailing address: SDSU Box 2201

Phone: 605/688-5719
 Fax: 605/688-5878

Department Head: Professor Gerald Bergum
 Graduate Coordinator: Professor Gerald Bergum

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.

Major Degrees Offered

- Master of Science: Engineering, with coursework in Computer Science
- Doctor of Philosophy: Not available

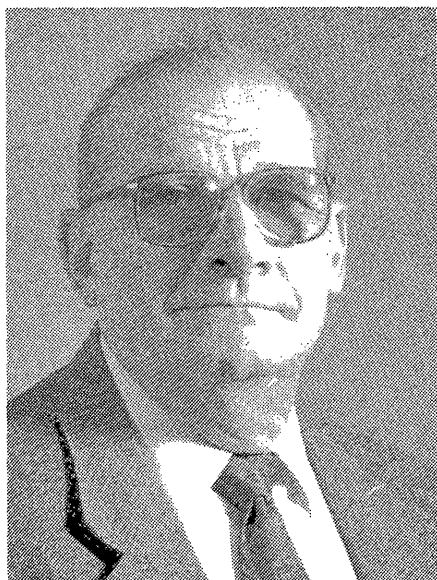
Additional Admission Requirements

- GRE: Not required
- TOEFL: Department requirement of 525

Refer to College of Engineering section, page 53, for specific details.

Computer Science (CSc) Course Offerings

- 572 Artificial Intelligence**3
F
 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.
- 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, Math 381 or Stat 341.
- 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, Math 224.
- 593 Special Topics in Computer Science**.....1-3
 Individualized problems determined by mutual agreement between instructor and student. Programming language optional. P, consent of department head.
- 630 Principles of Data Base System Design**3
F
 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.
- 643 System Analysis and Design**3
F
 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.
- 700/701 Seminar**0-1
 Current state-of-the-art topics in Computer Science. P, permission of instructor.



Gerald Bergum, Department Head
 Computer Science

705 Design and Analysis of Computer Algorithms	3
	<i>S</i>
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.	
710 Structure and Design of Programming Languages	3
	<i>F</i>
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 610.	
720 Theory of Computation	3
	<i>S</i>
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.	
740 Management Information Systems	3
	<i>S</i>
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.	
750 Recent Advances in Parallel Processing	3
	<i>F</i>
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.	
770 Software Engineering Management	3
	<i>F</i>
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.	
790 Thesis, MS	1-7
791 Thesis Sustaining, MS	0
792 Research Report/Design Paper	2
Conduct an approved research or design project and complete an approved research report or design paper in Computer Science.	
793 Special Topics in Computer Science	1-3
Individual topics determined by mutual agreement between the instructor and the student. Programming language optional. P, consent of Department Head.	
794 Special Problems in Computer Science	1-3
Independent study in specialized areas of computer science. Problems for advanced study selected according to students' specific interests, needs, or current research. Maximum of 6 credits. P, consent of instructor.	
795 Computer Science Research or Design Paper Sustaining	0
797 Research	1-9
Individualized research. Repeatable P/F. Credits cannot be used on Plan of Study. P, consent.	

Key to Course Descriptions

Course Number and NameCredits
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
 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

Department of Counseling and Human Resource Development

Graduate Faculty

Ruth Harper
 Assistant Professor
 Ph.D., Kansas State University, 1987
 Student Personnel Service Setting

Marla Muxen
 Associate Professor
 Ph.D., University of Minnesota-Minneapolis/
 St. Paul, 1990
 Agency Setting

Richard L. Roberts
 Associate Professor
 Ph.D., University of North Texas, 1991
 Agency Setting

Jill Schoen
 Assistant Professor
 Ed.D., University of South Dakota, 1991
 Agency Setting

Nona Wilson
 Assistant Professor
 Ph.D., Ohio University, 1993
 Agency Setting

Mailing address: SDSU Box 507

Phone: 605/688-4190

Fax: 605/688-6074

Department Head: Associate Professor Richard L. Roberts
 Graduate Coordinator: Associate Professor Richard L. Roberts

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.

Major Degrees Offered

Master of Science: Counseling and Human Resource Development

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Science: Option A
 Option B
 Option C

See page 110 for descriptions of available options.

Core Requirements

EdER 761 Research and Writing	3
CHRD 601 Introduction to Counseling	3
CHRD 610 Pre-Practicum	3
CHRD 661 Theories of Counseling	3
CHRD 721 Counseling through the Life Span	3
CHRD 736 Appraisal of the Individual	3
CHRD 742 Career Counseling and Planning	3
CHRD 766 Group Counseling	3
CHRD 787 Counseling Practicum	3

Additional Admission Requirements

GRE: Not required
 TOEFL: Department requirement of 525
 See side box on page 33.

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Counseling and Human Resource Development (CHRD) Course Offerings

601 Introduction to Counseling 3

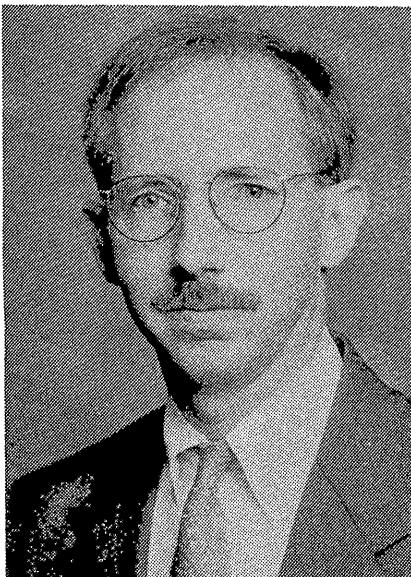
F, Su

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.

603 School Counseling 3

F

A study of the role and function of a K-12 school counselor including individual counseling, small group counseling, classroom guidance, and consultation with parents, teachers, administrators.



Richard L. Roberts, Department Head
 Counseling and Human Resource Development

610 Pre-Practicum3
 Developing basic human relations and helping skills; self-awareness and self-examination of the interpersonal communications process; emphasis on understanding self and others. Introduction to basic counseling and helping skills.

630 Gender Issues in Counseling3
F Su
 Emphasis on increasing the counselor's knowledge and awareness of facts and factors in gender specific experiences which are relevant to the counseling situation.

651 Mental Health and Personality Development3
on demand
 The nature of personality and developmental theory, mental health issues of children, adolescence and adults with emphasis on programs/strategies for positive mental health. Various personality assessment methods are used. On demand.

661 Theories of Counseling3
 An overview of major theories, the methods employed and appropriate applications. Assist beginning counseling students in comprehending the scope of various approaches in dealing with clients.

671 Counseling in Gerontology3
on demand
 This course will provide a broad foundation in the interdisciplinary study of gerontology by discussing the developmental, psychological, physical, cognitive, and personality changes that occur with normal aging. Psychopathology in the elderly will also be addressed. A variety of individual and group interventions will be examined.

681 Workshop.....1-3
 Special topics are comprehensively explored in an intensive time framework. Designed to increase specific skills and understandings in a current topic area.

682 Seminar1-3
 Selected area of education including special investigation, reports, and discussion.

690 Special Topics.....1-3
 Advanced courses taught upon demand covering such topics as crisis intervention, counseling special groups, cross cultural counseling, various counseling approaches, chemical dependency, etc.

706 Counseling the Victim3
S Su, 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.

713 Administration and Management of Mental Health Care Organizations3
S
 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.

716 Human Resource Management in Business and Industry3
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.

721 Counseling Through the Life Span3
F Su
 Provides an understanding of the developmental needs of humans across the life span and adolescents and appropriate intervention methods to be used in counseling.

REQUIREMENTS FOR ADMISSION TO THE PROGRAM

Step 1. Acceptance by the Graduate School. (see page 5 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 adviser for these students. No more than ten credits under Special Student status may be applied toward a degree. The last statement is important in that it will limit the number of credits you can take in our department before being formally accepted. The formal acceptance process is outlined in Step 2.

Step 2. Admission to the Counseling and Human Resource Development Department.

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

- 1) A one or two page, typewritten goal statement including one or more of the following:
 - a. Your 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 two pages will not be considered.

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

3) Two completed Reference Evaluation Forms. These forms should be completed by a current or recent employer, and/or a current or recent professor (non-CHRD), and/or one other individual who is professionally acquainted with the applicant's work.

b. Applicants are required to attend an orientation and group interview held approximately one month after the October and May deadline. The purpose of this personal interview is to provide you with an overview of the program. You will be asked to participate in some exercises and be evaluated. If your application is complete by the deadline, please contact the departmental secretary at 605/688-4190 to obtain the specific date and place of the interview.

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

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

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

Additional Requirements

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

Counseling in an Agency Setting
 CHR723 Counseling the Family3
 CHR755 Mental Pathology3
 CHR789 Counseling Internship:
 Agency Setting6
 EPsy 762 Testing Practicum:
 Personality Assessment2

Counseling in a School Setting
 CHR603 School Counseling3
 CHR789 Counseling Internship:
 School Setting6
 CHR722 Administration and
 Management of School
 Counseling Programs3
 CHR755 Mental Pathology3
 OR
 CHR723 Counseling the Family3

Counseling in a Student Personnel Services Setting
 CHR770 Student Development:
 Theory and Practice3
 CHR771 Student Personnel Services ...3
 CHR772 Administration and
 Leadership in Student
 Affairs3
 CHR789 Counseling Internship:
 Student Personnel6

Advanced Education courses are listed within the Department of Educational Leadership section, beginning on page 42.

722 Administration and Management of School Counseling Programs3
 Developing and managing a comprehensive counseling program in a school setting. Emphasis on the planning process, management, budgeting, organizational structure, supervision, evaluation and consultation.

723 Counseling The Family3
 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.

736 Appraisal of the Individual3
 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.

742 Career Counseling and Planning3
 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.

755 Mental Pathology3
 F
 Focuses on the various abnormalities in personalities, behaviors and levels of functioning in society. Specific attention given to the behavioral disorders which are most commonly seen in our society. P, Abnormal Psychology, consent.

756 Counseling the Addictive Client3
 Counseling the addictive client is a course which describes how one can identify and treat addictive behaviors. Emphasis is on preventive and remedial action.

766 Group Counseling3
 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, CHR760, 610, 661, EdER 761. Written permission. P, consent.

770 Student Development: Theory and Practice3
 F
 Develops an understanding of college student personnel functions and their interrelatedness in a coordinated effort to provide student services. Focuses on the personnel administrator's role in understanding and incorporating concepts to student development.

771 Student Personnel Services3
 S
 Focuses on legal cases and precedents that have a major impact on higher education and the field of student personnel administration, the development of conflict management skills, control theory, transactional analysis, and other communication concepts.

772 Administration and Leadership in Student Affairs3
 S
 Provides an overview of administrative and leadership practice in Student Affairs work. The course focuses on the theoretical foundations of Student Affairs administration and the utilization of those foundations in the daily management of Student Affairs units. Student will gain both knowledge and experience in applying theory to the administration of Student Affairs operations. Cross-listed with AHED 772.

787 Counseling Practicum3-5
 Eligibility for this course requires the completion of a minimum of 20 semester credit hours including EdER 761, CHR760, 610, 661, 766, with a grade of "B" or above in CHR760 and 766. Students must also have proof of professional liability insurance prior to enrollment. This course is where students begin to apply their skills with clients and the faculty reserve the right to deny admission to CHR787 if they have reason to suspect that the student's personal limitations might impair their ability to deliver quality services to clients. Written permission. P, consent.

788 Group Counseling Practicum2-4
 Supervised practicum in conducting small group counseling sessions. P, CHRD 766, consent.

789 Internship.....2-6
 Eligibility for Internship requires that the student have completed CHRD 787 Counseling Practicum with the grade of "B" or better, and a substantial amount of their course work. Ideally, all course work would be completed prior to enrollment. Students must have proof of professional liability insurance that is in force for the duration of this experience. Internships must be in appropriate settings under the direct supervision of a qualified and appropriately credentialed professional. Due to the nature of this course (students working directly with clients) the faculty reserve the right to deny admission to CHRD 789 if they have reason to suspect that the student's personal limitations might keep them from rendering competent services. P, consent, approval from Internship Committee.

790 Thesis, MS1-6

791 Thesis Sustaining, MS0

792 Research Problems2
 A problem is selected, analyzed, and reported in form approved by the research adviser. *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.

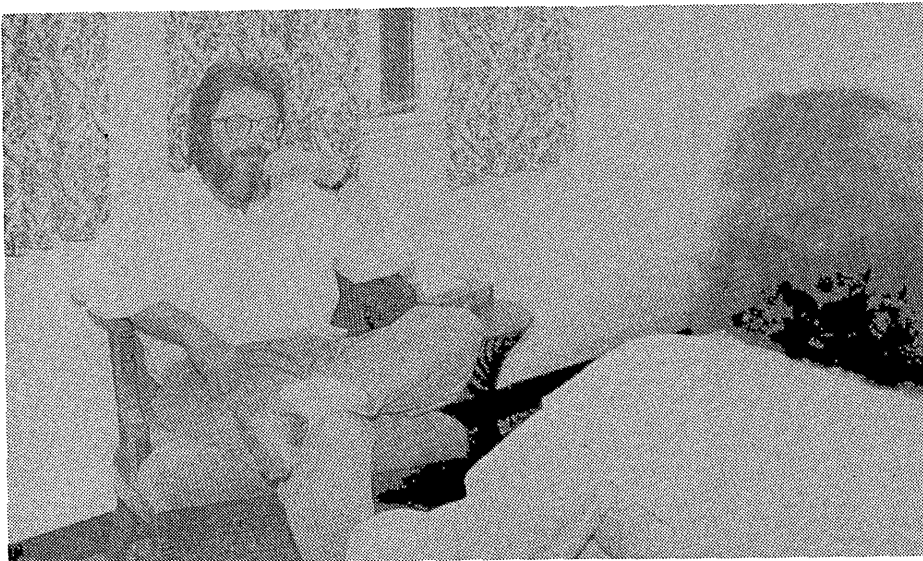
793 Problems1-3
 Directed reading and research in selected individual guidance and counseling topics.

Key to Course Descriptions

Course Number and NameCredits
 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.



Department of Dairy Science

Graduate Faculty

Robert J. Baer
Professor

Ph.D., University of Georgia, 1983
Sensory Evaluation of Dairy Products, Dairy
Chemistry

Sharon Franklin
Assistant Professor

Ph.D., Iowa State University, 1993
Nutritional Immunology/Dairy Farm
Management

David Henning

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

Vikram Mistry
Professor

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

John G. Parsons
Professor

Ph.D., Pennsylvania State University, 1968
Dairy Chemistry, Flavor Analysis

David J. Schingoethe
Professor

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



John Parsons, Department Head
Dairy Science

Mailing address: SDSU Box 2104

Phone: 605/688-4116

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

Program Description

The Dairy Science Department invites applications to graduate programs leading to a Master of Science degree with a major in Dairy Science and a Doctor of Philosophy degree with a major in Animal Science or Biological Sciences. The department offers M.S. programs in Dairy Manufacturing and both M.S. and Ph.D. programs in Dairy Cattle Nutrition and Management. A Ph.D. degree is available through the Biological Sciences program with an area of study in Dairy Manufacturing.

Major Degrees Offered

Master of Science: Dairy Science

Doctor of Philosophy: Animal Science
Biological Sciences, with an area of study in Dairy Science

Available Options for Graduate Degrees

Master of Science: Option A

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

See pages 110 (M.S.) and 113 (Ph.D.) for descriptions of available options.

Core Requirements

None

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Dairy Science (DS) Course Offerings

513 Physiology of Lactation	3
<i>S, odd years</i>	
Anatomy, physiology, and biochemistry of mammary glands. Factors affecting quality and quantity of milk. P, Vet 223 or equivalent. Alternate years.	
702 Seminar	1
<i>S</i>	
Research report writing, oral reports and discussion of current research in dairy production, dairy manufacturing, and related sciences. Maximum of 2 credits will be allowed for Master of Science or 4 credits for Doctor of Philosophy degree.	
711 Ruminology	3
<i>F, odd years</i>	
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.	
722 Advanced Dairy Microbiology	3
<i>S, even years (2,3)</i>	
Role of microorganisms in manufacture and spoilage of dairy products. Emphasis on starter culture technology. P, DS 301 or Micr 311.	
731 Laboratory Techniques in Dairy Science	2
<i>F, even years (0,6)</i>	
Research design, laboratory techniques, and data management and presentation in Dairy Science. Laboratory procedures include photometry, gas chromatography, and microbiological (aerobic and anaerobic) assays.	

780 Dairy Science Problems1-4
 Investigation of problems in dairy production or dairy manufacturing. Results submitted as a technical paper. P, consent.

790 Thesis, MS1-7

791 Thesis Sustaining, MS0

890 Dissertation, PhD1-12

891 Dissertation Sustaining, PhD0

Key to Course Descriptions

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 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

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

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



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 newly constructed dairy production research and training facility where it maintains a herd of 160 dairy cows for teaching and research. 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.

Department of Economics

Graduate Faculty

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

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

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

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

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

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

William E. Kamps
Professor
Ph.D., Washington State University, 1974
Macroeconomic Theory; History of Economic Thought; Industrial Organization

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

Gene Murra
Professor
Ph.D., The Ohio State University, 1963
Livestock Marketing

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

Mailing address: SDSU Box 504A

Phone: 605/688-4141
Fax: 605/688-6386

Department Head: Professor Richard Shane
Graduate Coordinator: Professor Charles Lamberton

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 such as computer science, statistics, or engineering. Many courses are offered in the evening. A limited number of research and teaching assistantships are available for qualified students. The Economics Department participates in the Master of Science in Industrial Management program. Many Economics Department courses satisfy the requirements for the MSIM degree.

Major Degrees Offered

Master of Science: Economics
J.D./M.S. in Econ, cooperatively with USD

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Science: Option A
Option B

See page 110 for descriptions of available options.

Core Requirements

Econ 701 Research Methods	2
Econ 703 Advanced Macroeconomics	3
Econ 704 Advanced Microeconomics	3
Econ 705 Econometrics	3
Econ 624 Advanced Mathematical Economics	3

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

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

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

General Requirements begin on page 106. 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.

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

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

Agricultural Economics (AgEc) Course Offerings

571 Advanced Farm and Ranch Management3 S

Leasing arrangements, capital investment, computerized accounting and budgeting. Linear programming as a tool for planning and organizing the farm business. P, AgEc 271, Econ 202, 2 credits of CSc or consent.

630 Advanced Agricultural Marketing and Prices3

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

690 Special Problems1-3

Advanced work or special problems with focus on agriculture. Open to graduate students. P, consent.

Economics (Econ) Course Offerings

504 History of Economic Thought3 F

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

520 Economics of the Public Sector3

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

531 Managerial Economics3

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

540 Economics of the International Sector3

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

550 Industrial Organization3

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

560 Economic Development3

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



*Richard Shane, Department Head
Economics*

Key to Course Descriptions

Course Number and NameCredits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

Courses with no FSSu notation, are offered either FS, FSSu, or on demand.

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



Charles Lamberton, Graduate Coordinator
Economics

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 202.	
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.	
610 Financial Management	3
Advanced techniques for managing working capital, capital budgeting, analysis of financial structure and cost of capital, valuation, financial planning and control. P, BAdm 310, Stat 341 or Math 381, or consent.	
690 Special Problems	1-3
Advanced work in special problems in economics. Open to graduate students by consent.	
701 Research Methods	2
Planning and conducting empirical research in economics; the organization of research; the philosophy and aim of science. P, two statistics courses or consent.	
703 Advanced Macroeconomics	3
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.	
704 Advanced Microeconomics	3
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.	
705 Econometrics	3
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.	
724 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.	
753 Advanced Market Research	3
Strategic marketing and decision making with emphasis on utilizing both qualitative and quantitative techniques as well as marketing models. P, Econ 301, Econ 353, and Stat 341 or Math 381.	
760 Operations Management	3
Product planning, demand forecasting and management, capacity planning, scheduling, inventory planning and timing, materials management, quality, work standards and measurement. P, BAdm 360, Econ 301 and Stat 341 or Math 381.	

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.

790 Thesis, MS(as arranged)1-5

791 Thesis Sustaining, MS0

792 Research Paper, MS2

793 Graduate Special Topics1-4
 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.

Key to Course Descriptions

Course Number and NameCredits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

Courses with no FSSu notation, are offered either FS, FSSu, or on demand.

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

Department of Educational Leadership

Graduate Faculty

Carl E. Edeburn
Professor
Ph.D., University of North Dakota, 1973
Leadership, Foundations, Assessment

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

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

Darrell M. Jensen
Professor
Ph.D., University of Iowa, 1971
Leadership

Michael N. Johnson
Associate Professor
Ph.D., University of Illinois-Urbana, 1981
Leadership, Foundations, Elementary/Middle

Charles Lingren
Professor
Ph.D., University of Iowa, 1975
Leadership, Effective Schools, Teaching

Jon Marshall
Professor
Ed.D., University of Kansas, 1966
Research, Assessment

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

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

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

Gary Steinley
Professor
Ph.D., University of Utah, 1970
Reading, Teaching

Lois Widvey
Professor
Ed.D., University of Nebraska-Lincoln, 1971
Learning Styles, Curriculum

Mailing address: SDSU Box 507

Phone: 605/688-6365

Fax: 605/688-6074

Department Head: Professor R.L. Erion
Graduate Coordinator: Professor R.L. Erion

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 and 4-year college instructors. Within this major, the following emphases are available:

- A. Adult and Higher Education
- B. Computer Education
- C. Content Areas (English, mathematics, social studies, etc.)
- D. Gifted Education
- E. Middle School Education
- F. Reading Education
- G. Instructional Enhancement
- H. Vocational/Technical Education
- I. Agricultural Education

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 following emphases are presently available:

- A. Elementary Administration
 - B. Secondary Administration
 - C. Vocational/Technical Administration*
 - D. Adult and Higher Education*
- *May not lead to certification (see advisor)

Major Degrees Offered

Master of Education: Curriculum and Instruction
Educational Administration
Vocational Technical Education (degree no longer available as of July 1, 1996)

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Education: Option B
Option C

See page 110 for descriptions of available options.

Core Requirements

Curriculum and Instruction, see page 47
Educational Administration, see page 44

Additional Admission Requirements

GRE: Not required
TOEFL: Department requirement of 550

Applicants must provide a resume, goal statement, and two letters of professional reference to the Department. Once all material is received by the Department, it is

reviewed by the Admissions Committee consisting of two faculty members and the Department Head. The Committee assigns an admission status to each application; "unconditional", "conditional" or "not admitted".

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Agricultural Education (AgEd) Course Offerings

- 606 Problems**1-3
Directed reading and research in selected Agricultural Education topics.
- 705 Seminar**1-2
Selected areas of Agricultural Education including special investigation, reports, and discussion.
- 706 Adult Education in Agriculture**2
Su
Policies, methods, materials and organization of adult education program in vocational agriculture/agri-business; course planning, procedures, media, follow-up and evaluation in adult program. P, graduate student in Agricultural Education.
- 707 Supervised Occupational Experiences and Student Groups in Agricultural Education**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.
- 776 Curriculum in Agricultural Education**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. Cross-listed with VTE 776.
- 792 Research Problems in Agricultural Education**2
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

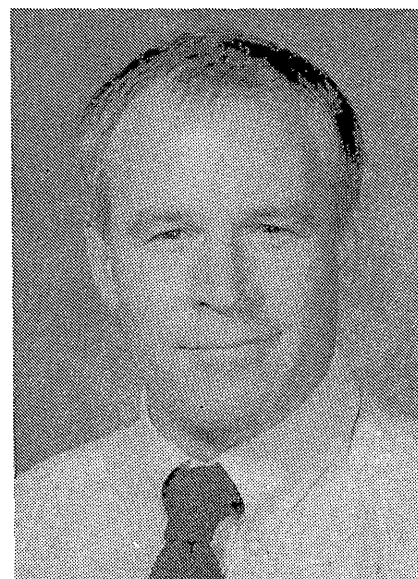
- 600 Special Problems in Extension**2-6
Individually assigned investigative problems in Extension. Individual conference with laboratory and/or field work. Arrangements with Extension staff must be made prior to registration.
- 681 Workshop in Adult and Continuing Education**1-3
Special areas in adult and continuing education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understanding in a current area.
- 691 Problems**1-3
Directed reading and research in selected individual adult and continuing education topics.
- 710 Adult Curriculum and Instruction**3
F
Adult learning theory and instructional methods. Principles of adult curriculum design. Social and cultural factors and their effects on the learning process.
- 711 Organization and Administration of Adult Education**3
S
Organization and implementation of adult education programs. Particular emphasis on curriculum development, financing, staffing, marketing, and evaluation of adult programs.

Key to Course Descriptions

Course Number and NameCredits
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.



R.L. Erion, Department Head
Educational Leadership

**Educational Administration
Requirements**

Required Core

EdAd 700 Public School Administration3
 EdAd 715 Supervision3
 EdFn 725 Education in a Pluralistic Society3
 EdFn 727 Group Processes3
 EdER 711 Educational Assessment3
 EdER 761 Research and Writing3
 EdFn 782 Seminar: Capstone1

**Elementary and Secondary Program
Specialization**

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

**Adult & Higher Education Program
Specialization***

AHEd 710 Adult Curriculum and Instruction3
 AHEd 711 Organization and Administration of Adult Education3
 CHRd 771 Student Personnel Services3
 OR
 EdAd 735 School Law3
 HDCF 614 Adult Development3
 OR
 CHRd 770 Student Development: Theory into Practice3
 AHEd 789 Internship2

**Vocational/Technical Education Program
Specialization***

VTE 710 Curriculum Design in Vocational Education3
 VTE 731 Administration and Supervision of Vocational Education3
 VTE 789 Internship2-6

*Will not lead to Elementary/Secondary Principal Certification

751 Principles of College Teaching3

An analysis of teaching methodologies, planning procedures, evaluation techniques, and professional relationships. Emphasis will be on learning and using strategies suitable for teaching.

772 Administration and Leadership in Student Affairs3

Provides an overview of administrative and leadership practice in Student Affairs work. The course focuses on the theoretical foundations of Student Affairs administration and the utilization of those foundations in the daily management of Student Affairs units. Student will gain both knowledge and experience in applying theory to the administration of Student Affairs operations. Cross-listed with CHRd 772.

782 Seminar1-3

Study in selected areas of adult and continuing education including special investigation, reports and discussion.

789 Internship2

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.

792 Research Problems2

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

Educational Administration (EdAd) Course Offerings

700 Public School Administration3

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.

710 Elementary School Administration3

Emphasis is on the elementary principal as an instructional leader. Major topics focusing on staff recruitment, supervision and evaluation of Student Services, rights and responsibilities, research on effective schools, parent and community relationships and the principal's role in dealing with current issues facing our schools.

711 Secondary School Administration3

Emphasis is on the secondary 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.

715 Supervision3

A study of leadership styles and the effects different styles have on motivating people. Emphasis on utilizing and developing human potential.

730 School Finance2

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.

732 School Buildings and Grounds2

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.

735 School Law3
S, Su
 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.

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

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

789 Internship1-6
 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.

792 Research Problems2
 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.

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

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

Education Evaluation and Research (EdER) Course Offerings

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

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

711 Educational Assessment3
S, Su
 Examines the theory and principles of standardized group tests. Aptitude, achievement, career, and personality assessment instruments are also examined. Practice in administration, scoring, and interpretation of results.

761 Research and Writing3
 Main objectives are: a) understanding standard and new research procedures in education, b) acquaintance with up-to-date research on present-day educational problems, and c) understanding and using evaluation standards for educational research. Required of most graduate majors in education.

Education Foundations (EdFn) Course Offerings

527 Middle School: Affective Applications2
S, Su
 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, an adolescent psychology/development course of 3 credits.

528 Middle School Curriculum and Instruction	3
<i>S, Su</i>	
The essential methods and materials of judging high/middle school instruction. Method 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, an adolescent developmental/psychology course of 3 credits.	
551 Curriculum and Instruction in Gifted Education	3
<i>Su</i>	
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.	
590 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 Public Law 94-142 and other topics not regularly taught in the program.	
605 Computers in the Classroom	2
<i>Su</i>	
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.	
648 Learning Styles	3
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.	
700 Working With Exceptional Children	3
<i>S</i>	
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.	
720 History and Philosophy of Education	3
<i>F, Su</i>	
An overview of the history of education coupled with the development and application of educational philosophy in contemporary practice.	
725 Education in a Pluralistic Society	3
<i>S, Su</i>	
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.	
727 Group Processes	3
<i>S, Su</i>	
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.	
744 Research on School Improvement	3
<i>F, Su</i>	
Addresses the extensive research relating to the effective school movement. Pertinent conceptualizations and research related to school climate, instructional leadership, focus, and the establishment of school/teacher expectations will be discussed. Research based tools and skills will be employed.	

745 Effective Teaching: Theory Into Practice.....3
S,Su
 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.

751 Teaching Reading Across Disciplines.....3
 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. Alternate years.

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

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

754 Clinical Practice in Reading2
(1,4)
 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. On demand.

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

789 Internship in Gifted Education1-6
 This internship provides an opportunity to develop, refine, and practice skills and theories in an applied setting focusing on gifted education. It is to be completed near the end of course work on teaching gifted persons. Students should contact the Department Head a semester in advance of the Internship.

Elementary Education (ElEd) Course Offerings

581 Workshop.....1-3
 Special areas in elementary education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understanding in a current area.

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

Educational Psychology (EPsy) Course Offerings

526 Psychology of the Early Adolescent Learner3
F,Su
 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- to 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.

Curriculum and Instruction Requirements

Required
 EdER 761 Research and Writing3
 EdFn 720 History and Philosophy of Education3
 EdFn 725 Education in a Pluralistic Society3

Elementary and Secondary Program Additional Requirements
 EdFn 745 Effective Teaching: Theory into Practice3
 ElEd 773 Elementary School Curriculum3
 OR
 SeEd 740 Secondary School Curriculum3
 EPsy 740 Advanced Educational Psychology3
 EdFn 744 Research on School Improvement3
 EdFn 727 Group Processes3
 EdER 711 Educational Assessment3
 EdFn 782 Seminar: Capstone1

Adult and Higher Education Additional Requirements
 AHed 710 Adult Curriculum and Instruction3
 AHed 711 Organization and Administration of Adult Education3
 AHed 751 Principles of College Teaching3
 HDCF 614 Adult Development Theory ...3
 EdFn 727 Group Processes3
 EdER 711 Educational Assessment3
 EdFn 782 Seminar: Capstone1

Vocational Technical Education Additional Requirements*
 EPsy 740 Advanced Educational Psychology3
 OR
 HDCF 614 Adult Development Theory ...3
 VTE 625 Development of Vocational Education Thought and Practice3
 VTE 700 Technology in Vocational Education3
 VTE 710 Curriculum Design in Vocational Education3

*Note that the VTE program is under review at this time and that the course work will likely change considerably during the period covered by this catalog. Please contact the department for current information if you are interested in this program.

550 Gifted and Talented	3
<i>Su</i>	
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.	
552 Enhancing Creativity	3
<i>Su</i>	
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.	
630 Learning Disabilities	3
<i>S,Su</i>	
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. Alternate years.	
740 Advanced Educational Psychology	3
<i>F,Su</i>	
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.	
761 Testing Practicum: Intellectual Assessment	2
<i>F,Su</i>	
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.	
762 Testing Practicum: Personality Assessment	2
<i>F,Su</i>	
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.	
763 Testing Practicum: Projective Techniques	2
<i>F,Su</i>	
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.	

Secondary Education (SeEd) Course Offerings

581 Workshop	1-3
Special areas in secondary education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understanding in a current area.	
590 Special Topics	1-3
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.	
672 Motivation and Discipline	3
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.	
682 Seminar	1-3
Study in selected areas of education including special investigation, reports, and discussion.	
691 Problems	1-3
Directed reading and research in selected individual education topics.	

40 Secondary School Curriculum3
F, Su
 A study of the nature and principles of curriculum and 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.

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

92 Research Problems2
 A problem is selected, analyzed, and reported in a form approved by the research advisor. *Required* of all graduate students in education qualifying for the degree under Option B. Can be *elected* under Option C if desired. P, consent.

Vocational Technical Education (VTE) Course Offerings

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

590 Special Topics1-3
 Advanced courses taught on demand covering such topics as computer applications, state and federal rules and regulations, new curriculum development, etc.

525 Development of Vocational Education, Thought and Practice3
Su
 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.

700 Technology in Vocational Education3
 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.

710 Curriculum Design in Vocational Education3
 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.

720 Entrepreneurship in Vocational Education3
 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 plan, government regulations, site locations, record keeping, financing, legal consideration, business promotion, managing human resource, 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.

730 Cooperative Education Coordination Techniques3
 This course emphasizes the organization and coordination of cooperative work experience in vocational education programs: agriculture, marketing education, health occupational, home economics, 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.

731 Administration and Supervision of Vocational Education	3
<p style="text-align: right;"><i>54</i></p> <p>Organization, administration of vocational-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.</p>	
743 Special Topics	1-3
Advanced courses taught upon demand.	
751 Curriculum in Home Economics Education	2
Cross-listed with FCSE 751.	
761 Evaluation in Home Economics	2
Cross-listed with FCS 761.	
776 Curriculum in Agricultural Education	2
For teachers, administrators and supervisors of vocational agriculture/programs at secondary, post secondary and adult levels; principles and procedures in course building, courses of study, and curriculum. Cross-listed with AgEd 776.	
782 Seminar	1-3
Study in selected areas of vocational education including special investigation, reports, and discussion.	
789 Graduate Internship	1-3
Students apply and contract for structured learning and skills training opportunities in industry or business. Individual contracts must describe specific training and development to be accomplished during the internship. Enrollment requires instructor's prior approval of the internship contract. Requires committee approval.	
790 Thesis, MS	1-5
791 Thesis Sustaining	0
792 Research Problems	2
Significant action research in an area related to the student's technical specialty. A problem is selected, analyzed and reported in a form approved by the research advisor. Required of all graduate students in education qualifying for the Master's of Education degree under the Research Option. Requires advisor's approval.	
793 Problems	1-3
Directed reading and research in selected vocational education topics.	

Department of Electrical Engineering

Mailing address: SDSU Box 2220

Phone: 605/688-4526

Fax: 605/688-5880

Department Head: Associate Professor Lewis F. Brown

Graduate Coordinator: Professor Robert G. Finch

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, materials science, communications, and RF electronics. Each of these areas of study is strengthened by on-going research work conducted by the department's faculty. Additional courses are offered through EE 693 and EE 793 Special Topics in Electrical Engineering, and individualized instruction is available through EE 690 Special Electrical Problems.

Major Degrees Offered

Master of Science: Engineering, with coursework in Electrical Engineering

Doctor of Philosophy: Not available

Additional Admission Requirements

GRE: Required starting Spring 1997.

TOEFL: Department requirement of 550

Refer to College of Engineering section, page 53, for specific details.

Electrical Engineering (EE) Course Offerings

510 Passive and Active Filters3 (3,0) or (2,3)

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.

515 Microprocessor Controls3

Analysis and Design of control systems based on microprocessors. Both linear and non-linear systems are considered. P, EE 447.

524 RF Electronics3

Performance analysis and design methods for the functional blocks of radio frequency systems operating below the microwave bands. P, EE 321, EE 316.

533 Computer Analysis of Power Systems3

Concepts used in formulating load flow and fault study problems for computer solution. P, EE 430, FORTRAN or consent.

547 Advanced Microprocessor System Design3

Details of microcomputer hardware design, DMA, multiprocessing, memory management and testing strategies. Advanced microprocessor architectures. P, EE 447.

550 Biomedical Signal Processing3

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.

552 Biomedical Systems Analysis3

Engineering concepts applied to the study of biological systems. Modeling of representative biological systems and analysis using techniques developed in the engineering disciplines. P, EE 316 or equivalent.

Graduate Faculty

Alfred S. Andrawis
Associate Professor

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

Madeleine Andrawis
Associate Professor

Ph.D., Virginia Polytechnic Institute and
State University, 1991
Electromagnetics; VLSI

Lewis F. Brown

Associate Professor

Ph.D., Iowa State University, 1988
Electronic Materials, Biomedical Engineering

Virgil G. Ellerbruch
Professor

Ph.D., University of Wyoming, 1969
Circuits, Electronics

Robert G. Finch

Professor

Ph.D., Purdue University, 1974
Digital Signal Processing, Data Compression

David W. Galipeau

Associate Professor

Ph.D., University of Maine, 1992
Electronic Devices, Materials, Microsensors

Dennis Helder

Associate Professor

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

Douglas B. Miron

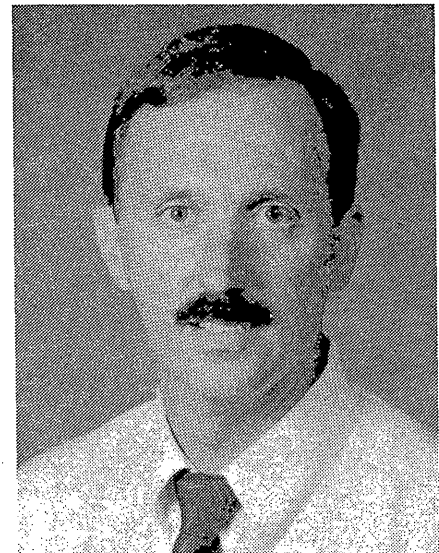
Professor

Ph.D., University of Connecticut, 1977
Analog Electronics and Systems

Duane E. Sander

Professor

Ph.D., Iowa State University, 1964
Biomedical Engineering, Industrial
Management



Lewis F. Brown, Department Head
Electrical Engineering

Key to Course Descriptions

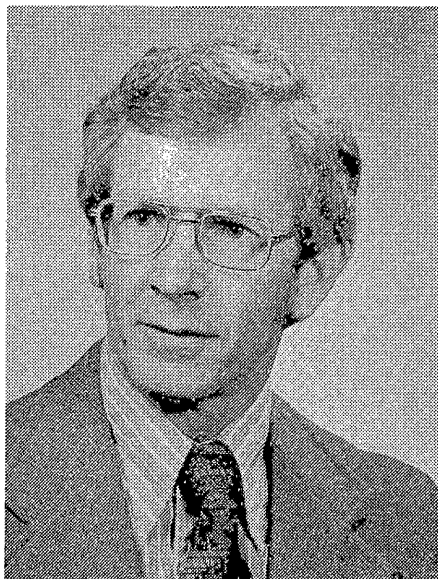
Course Number and NameCredits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

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.

**Electrical Engineering
 Core Requirements**

EE 615 Linear Systems Theory	3
EE 665 Electrical Properties of Materials	3
EE 670 Information and Signal Processing	3
EE 685 Microwave Theory	3
EE 700 Seminar	0
EE 701 Seminar	1



Robert G. Finch, Graduate Coordinator
 Electrical Engineering

554 Biomedical Instrumentation and Electrical Safety	3
Methods for designing instrumentation for measurement and safety, analysis of instrument dynamics, interpretation of electrical codes and facility safety. Provides background material for engineers working with architects, consultants, and contractors. P, EE 321.	
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.	
571 Optical Fiber Communications	3
Theory and application of optical fibers and communications systems. Topics include fundamentals of optical fiber waveguides, electroluminescent sources, single-mode and multimode, propagation, coupling consideration photodetectors, signal degradation, fabrication and cabling, and transmission link analysis. P, EE 316 or consent.	
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.	
593 Special Topics in Electrical Engineering	1-3
Current topics in selected areas of engineering.	
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.	
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.	
665 Electrical Properties of Materials	3
Topics covered will be concerned with electromigration, diffusion, theory of rate processes, relaxation effects, phase transformations, physics of dielectrics, and other topics associated with the physics of failure in electrical circuit applications. P, Math 331, Phys 331, EE 360 or consent.	
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.	
685 Microwave Theory	3
Transmission lines, resonant cavities, waveguide junctions, and components. Active devices, lasers, masers. P, EE 385.	
690 Special Electrical Problems	1-3
693 Special Topics in Electrical Engineering	1-3
<i>P, consent</i>	
700-701 Seminar	0-1
790 Thesis, MS	1-7
791 Thesis Sustaining, MS	0
792 Research or Design Paper, MS	2
793 Special Topics in Electrical Engineering	1-3
795 Engineering Research and Design Paper Sustaining, MS	0
797 Research	1-9

Mailing address: SDSU Box 2219

Phone: 605/688-4161

Fax: 605/688-5878

Dean: Professor Duane E. Sander

Assistant Dean: Professor Virgil G. Ellerbruch

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.

Master of Science in Industrial Management

The purpose of this program is to provide the knowledge, skills, techniques, and analytical tools necessary to effectively manage and understand the financial and technical aspects of a complex operation. Participants in this program will be those who have recently assumed positions of management responsibility or those experienced managers who want to develop new management styles and techniques. Studies may concentrate in manufacturing areas such as quality control, inventory management, materials handling, reliability, testing or production equipment design. Human resource management, product planning and design, safety, liability and product promotion, management leadership styles, motivation, etc., could also be areas of special emphasis.

Doctor of Philosophy in Atmospheric, Environmental and Water Resources

The purpose of this program is 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.

Major Degrees Offered

Master of Science: Engineering
Areas of coursework include:
 Agricultural Engineering
 Civil and Environmental Engineering
 Computer Science
 Electrical Engineering
 Mechanical Engineering
 Physics
 Industrial Management

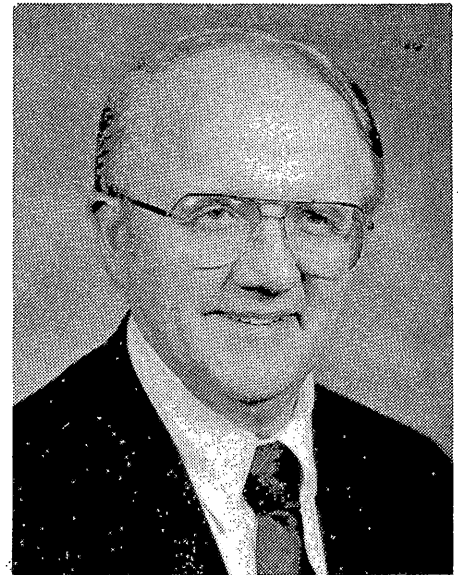
Doctor of Philosophy: Atmospheric, Environmental and Water Resources

Available Options for Graduate Degrees

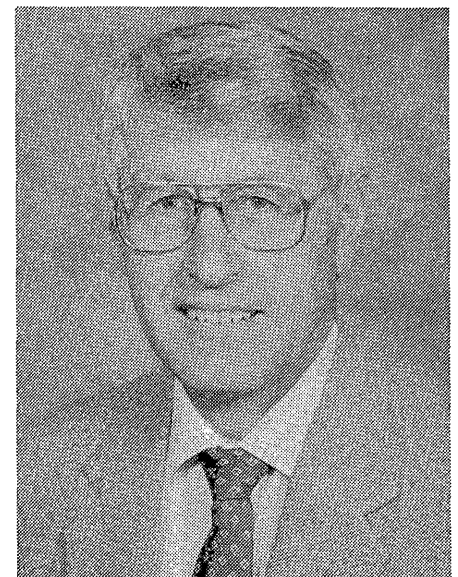
Master of Science: Option A
 Option B
 Option C

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

See pages 110 (M.S.) and 113 (Ph.D.) for descriptions of available options.



*Duane E. Sander, Dean
 College of Engineering*



*Virgil G. Ellerbruch, Assistant Dean, College
 of Engineering and Coordinator of Master of
 Science in Industrial Management*

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/Biomaterial 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 and 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 665 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

Core Requirements for MS 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 in the left column. 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 adviser.

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.

Core Requirements for MSIM

This twelve (12) credit core consists of at least three (3) semester credit hours of work chosen from four (4) out of the five (5) following topic areas: Finance; Management; Manufacturing; Quantitative Analysis Tools; and Management Information Systems.

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Department of English

Mailing address: SDSU Box 504

Phone: 605/688-5191

Department Head: Professor George West
Graduate Coordinator: Associate Professor Mary Ryder

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. Within the first year of study, each graduate student will take a written qualifying examination based on a reading list of representative literary works.

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

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

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

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

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

Major Degrees Offered

Master of Arts: English

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Arts: Option A
Option C

See page 110 for descriptions of available options.

Core Requirements

Engl 706, Research Tools in the Humanities
Reading knowledge of a modern foreign language or two years of undergraduate credit on the transcript.

Additional Admission Requirements

GRE: Required
TOEFL: Department requirement of 600

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Graduate Faculty

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

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

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

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

David Evans
Professor
M.F.A., University of Arkansas, 1976
Creative Writing

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

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

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

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

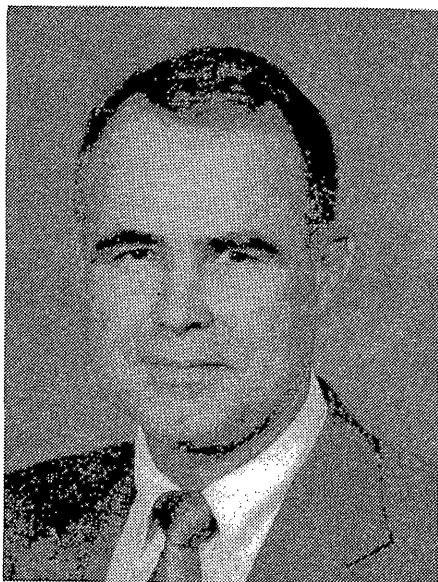
Mary Ryder
Associate Professor
Ph.D., University of Illinois-Urbana, 1987
American Literature

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

George A. West
Professor
Ph.D., University of Nebraska-Lincoln, 1972
English Medieval Literature

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



George West, Department Head
English

English (Eng) Course Offerings

522 Chaucer	3
Major works of Chaucer, with some attention to his sources and his language. Alternate years.	
527 Advanced Shakespeare	3
Selected plays of Shakespeare and significant Shakespearean criticism. Alternate years.	
528 Milton	3
Selected works of Milton, particularly <i>Paradise Lost</i> . Alternate years.	
532 English Romantic Literature	3
English Romantic poetry and prose from 1789 to 1850. Alternate years.	
536 English Victorian Literature	3
English poetry and prose from 1840 to 1900. Alternate years.	
540 Contemporary English Literature	3
English poetry and prose from World War II to the present. Alternate years.	
553 American Renaissance Literature	3
American literature of the mid nineteenth-century, including the Transcendentalists and Romantics. Alternate years.	
554 American Realist and Naturalist Literature	3
American literature of the realist and naturalist movements of the late 19th and early 20th centuries. Alternate years.	
560 Contemporary American Literature	3
American literature since WWII. Alternate years.	
585 Advanced Creative Writing	3
A course allowing students with experience in creative writing to specialize in a particular genre (poetry, fiction, etc.). P, Engl 383 or consent. Alternate years.	
655 Studies in Minority Literature	3
American literature of specific cultural or ethnic minorities other than Native American (African American, Asian American, Hispanic, Jewish, or women writers, for example). May be repeated once with different content.	
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.	
706 Research Tools in the Humanities	3
Survey of reference and research materials of special value and interest to students of the Humanities. <i>Required of all candidates for the M.A. degree in English.</i>	
707 Speech/English/Drama for Teachers	1-3
Workshop sessions in various areas of English: linguistics, composition or literature. This is a concentrated course; it may not be taken concurrently with any other course. P, teaching experience or consent.	
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.	
724 Seminar in English Literature to 1660	3
Intensive study of a selected type, theme, author, or period of English Literature from the beginning to 1660. Alternate years.	
725 Seminar in English Literature since 1660	3
Intensive study of a selected type, theme, author, or period of English literature since 1660. Alternate years.	

728 Seminar in American Literature to 19003
 Intensive study of a selected type, theme, author, or period of American literature to 1900. Alternate years.

729 Seminar in American Literature since 19003
 Intensive study of a selected type, theme, author, or period of American literature since 1900. Alternate years.

742 Seminar in American Indian Literature3
 Intensive study of American Indian literature of the past or present with concentration on the Plains Indians. Alternate years.

784 Seminar in Literary Criticism3
 The tradition of literary criticism from Plato to the present. Alternate years.

790 Thesis, MA(pass/fail) 1-7

791 Thesis Sustaining, MA(pass/fail) 0

795 Independent Research and Study1-3
 Directed independent research. May be repeated to a total 6 credits. P, consent of instructor and graduate advisor.

797 Special Topics in Composition and Literature1-3
 Special Studies in various areas of writing grammar, and literature. May be repeated to a total 6 credits. Given only with the permission of the Head of the Department of English.

Linguistics (Ling) Course Offerings

520 The New English3
 Diverse new theories and applications in English linguistics: lexicography, pragmatics, stylistics, socio-semantics, semiotics, discourse theory, and feminist paradigms.

543 Development of the English Language3
 Historical survey of the phonology, grammar, syntax, and lexicon of English leading to an understanding of the present state of the language and future developments. Alternate years.

552 General Semantics3
 Relations between symbols; human behavior in reaction to symbols including unconscious attitudes, linguistics assumptions; and the objective systematization of language. Cross-listed with SpCm 552. Alternate years.

Key to Course Descriptions

Course Number and NameCredits
 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.



Mary Ryder, Graduate Coordinator English

College of Family and Consumer Sciences

Mailing address: SDSU Box 2275A

Phone: 605/688-6181

Fax: 605/688-4439

E-Mail: nicholsl@mg.sdstate.edu

Dean: Professor Laurie Stenberg Nichols

Master of Science in Family and Consumer Sciences

The mission of the graduate program in Family and Consumer Sciences is to provide an in-depth, specialized program of study in Human Development, Consumer and Family Sciences; or Nutrition and Food Science. Graduate courses are occasionally offered in Apparel Merchandising and Interior Design to support the FCS graduate program. 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.

Major Degrees Offered

Master of Science: Family and Consumer Sciences

Areas of study include:

Apparel Merchandising and Interior Design

Human Development, Consumer and Family Sciences

Nutrition and Food Science

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Science: Option A

Option B

Option C

See page 110 for descriptions of available options.

Additional Admission Requirements

GRE: Not required

TOEFL: Department Requirements of 525

Core Requirements

FCS 700 Research Methods in Family and Consumer Sciences	3
FCS 601 Seminar in Family and Consumer Sciences	1
*FCS 790 Thesis in Family and Consumer Sciences	5
<i>or</i>	
FCS 795 Individual Research and Study: Area of Concentration	2

Additional Requirements

STAT 341 Statistical Methods I (or equivalent) 3

*STAT 541 Statistical Methods II is strongly recommended if student is completing Option A, Thesis.

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Family and Consumer Sciences (FCS) Course Offerings

500 Practicum in Family and Consumer Sciences 2-6
Provides an opportunity for students to gain experience in an applied setting related to their subject specialization. A learning plan is developed by the student and faculty member prior to the practicum. Consent of department and instructor is required.

592 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.



Laurie Stenberg Nichols, Dean
College of Family and Consumer Sciences

593 Current Topics1-3
 For students needing additional study of a topic or experience not offered as part of a regular class.

501 Seminar in Family and Consumer Sciences1
 Reports and discussion of research in various areas of Family and Consumer Sciences. Required of graduate majors.

511 History and Philosophy of Family and Consumer Sciences2
 Analysis of historical developments impacting on the profession and field of family and consumer sciences; critical investigation of various concepts of family and consumer sciences.

700 Research Methods in Family and Consumer Sciences3
 Empirical methods of solving problems in Family and Consumer Sciences. Formulation of a research problem and plan. Evaluation of research reports. P, Stat course and consent.

761 Evaluation in Family and Consumer Sciences2
 Methods and techniques used in evaluating programs in family and consumer sciences. Cross-listed with VTE 761.

790 Thesis, MS1-5

791 Thesis Sustaining, MS0

792 Special Problems1-3
 Individual research and study in Family and Consumer Sciences. P, consent of instructor.

793 Current Topics1-3
 Study of contemporary issues and concerns in the Family and Consumer Sciences profession. Focus on topics related to FCS as an integrated profession and not included within the departments of the college. P, consent.

794 Graduate Internship1-7

795 Individual Research and Study1-7

796 Individual Research Paper Sustaining0
 This course designation allows students to remain enrolled at SDSU while finishing reports associated with work completed for a Research Paper in Family and Consumer Sciences. P, FCS 795.

Key to Course Descriptions

Course Number and NameCredits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

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

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

Family and Consumer Sciences Education (FCSE) Course Offerings

592 Special Problems1-3
 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.

593 Current Topics1-3
 For students needing additional study of a topic or experience not offered as part of a regular class.

601 Trends in Family and Consumer Sciences Education2

741 Supervision in Family and Consumer Sciences Education2

751 Curriculum in Family and Consumer Sciences Education2
 Cross listed with VTE 751.

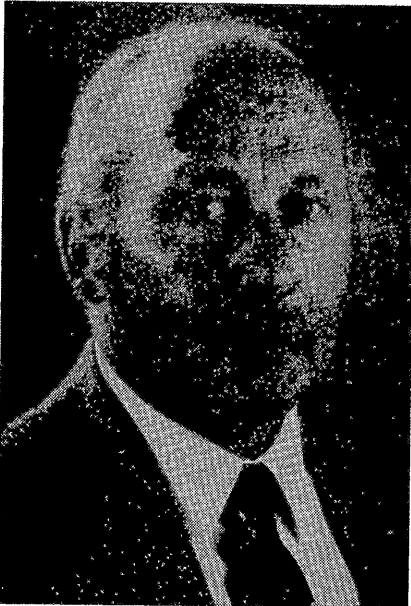
792 Special Problems1-3

793 Current Topics1-3

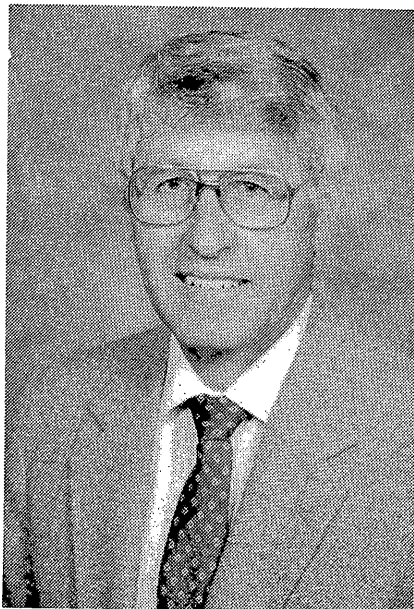
Department of General Engineering and Technology

Graduate Faculty

Jerry Sorensen
 Professor
 M.Ed., University of Illinois, 1967
 Electronics Engineering Technology



*Jerry Sorensen, Acting Department Head
 General Engineering*



*Virgil Ellerbruch, Graduate Coordinator
 General Engineering*

Mailing address: SDSU Box 507

*Phone: 605/688-6417
 Fax: 605/688-5878*

Acting Department Head: Professor Jerry Sorensen
 Graduate Coordinator: Professor Virgil Ellerbruch

Program Description

The Master of Science in Industrial Management degree is offered through the College of Engineering as an integrated but multidisciplinary program designed to provide knowledge, skills, techniques and analytical tools necessary to effectively manage and understand the human, financial and technical aspects of complex operations within today's manufacturing and industrial organizations.

Studies may concentrate in manufacturing areas such as quality control, inventory management, materials handling, reliability, testing or production equipment design. Human resource management, product planning and design, safety, liability and product promotion, management leadership styles, motivation, etc., could be areas of special emphasis.

Major Degrees Offered

Master of Science: Industrial Management

Doctor of Philosophy: Not available

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
Management	Quantitative Analysis Tools
Management Information Systems	

Suggested courses for each specific core topic area:

Management

Soc 533	Leadership and Group Organization	.....3
EdAd 715	Supervision	.....3
CHRD 716	Human Resource Management in Business and Industry	.....3
Econ 753	Advanced Market Research	.....3
Econ 782	Personnel and Labor Relations3
GE 543	Project Management3

Finance

Econ 710	Financial Management3
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Manufacturing

GE 610	Human Factors in Engineering and Design3
GE 620	Industrial Safety3
GE 525	Risk/Loss Control Management	.....2
Econ 760	Operations Management	.....3
ME 662	Quality Control	.....3
HSc 533	Industrial Hygiene	.....3

Quantitative Analysis Tools

Stat 581	Statistics for the Physical Sciences	.....3
ME 661	Operations Research	.....3
Econ 705	Econometrics	.....3

Management Information Systems

CSc 572	Artificial Intelligence	.....3
CSc 576	Computer Graphics	.....3
CSc 630	Principles of Data Base Systems Design	.....3
CSc 710	Structure and Design of Programming Languages	.....3
CSc 740	Management Information Systems	.....3

Additional Admission Requirements

GRE: Not required

TOEFL: Industrial Management requirement of 550

Refer to College of Engineering section, page 53, for specific details.

General Engineering (GE) Course Offerings

525 Risk/Loss Control Management2
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.

543 Project Management3
S
 Topics to be covered will include: Organization, Management Functions, Time Management, Scheduling, Trade-Off Analysis, Planning, Information Systems, Cost Controls, and International PM.

592 Special Engineering Problems1-3
 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.

593 Special Topics in General Engineering1-3
 Timely topics relating to Physical Science and Engineering. P, junior or senior standing in Engineering and consent of instructor.

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.

603 Designing the Workplace for Productivity3
 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.

610 Human Factors in Engineering and Design3
 Human factors engineering (HFE), sometimes called ergonomics, deals with optimizing working and living conditions through designing for human use. The central approach of HFE involves the systematic application of relevant information about user characteristics, behavior and expectations in the design of man-made products, equipment, facilities, and environments. The objectives of HFE are (1) to enhance the effectiveness and efficiency of work and other human activities; and (2) to enhance the product user's comfort, safety, health and satisfaction. P, Math 102, junior standing or consent of instructor.

620 Industrial Safety3
 Safety requirements and standards common to all industries and processes are reviewed. Attention is focused on legal safety requirements, particularly the Occupational Safety and Health Administration (OSHA) Standards. Emphasis is placed on how to recognize, evaluate, and control safety hazards associated with common industrial methods and technologies.

692 Special Problems in Engineering1-3
 Problems in engineering of mutual interest to graduate students and faculty. P, consent.

693 Special Topics in Engineering1-3
 Current topics in selected engineering areas. P, consent.

700-701 Seminar0-1

790 Thesis, MS1-7

791 Thesis Sustaining, MS0

792 Research Report/Design Paper, MS2

793 Special Topics.....1-3

795 Research Report/Design Paper Sustaining, MS0

797 Research1-9

Key to Course Descriptions

Course Number and NameCredits
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 of Geography

Graduate Faculty

Donald J. Berg
Associate Professor
Ph.D., University of California, Berkeley,
1976
Physical and Human Geography

Charles F. Gritzner
Distinguished Professor
Ph.D., Louisiana State University, 1969
Cultural Geography

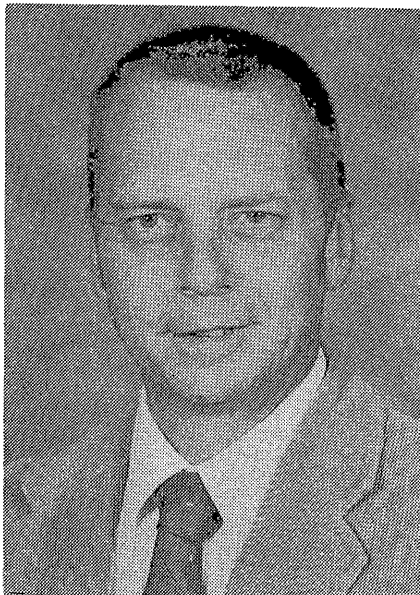
Janet Gritzner
Professor
Ph.D., Louisiana State University, 1978
Geographic Information System

Edward P. Hogan
Professor
Ph.D., St. Louis University, 1969
Social Geography

Darrell Napton
Associate Professor
Ph.D., University of Minnesota, 1987
Environmental Geography

Lee A. Opheim
Professor
Ph.D., St. Louis University, 1971
Physical Geography

Roger Sandness
Professor
Ph.D., University of Iowa, 1986
Quantitative and Physical Geography



Roger Sandness, Department Head
Geography

Mailing address: SDSU Box 504

Phone: 605/688-4511

Fax: 605/688-4030

Department Head: Professor Roger Sandness
Graduate Coordinator: Distinguished Professor Charles F. Gritzner

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, internships, experiences and supervised research, is designed to prepare students for positions in such professional areas as planning, remote sensing, geographic information systems, government service, research, business and teaching. The program is also designed to provide students with the training 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 by courses outside the department. Areas outside the department beneficial to the student include History, Economics, Education, Biology, Engineering, Plant Science, Sociology, Wildlife and Fisheries, and others.

Special programs are offered for students interested in unique educational experiences; among them are interdisciplinary minors in Planning and Geographic Information Systems. Other special programs can be taken through educational experiences provided for in the Alternatives and Options Programs of the College of Arts and Science, and a cooperative program with the EROS Data Center. Internships generally are available with planning districts, governmental agencies, business, and industry.

Major Degrees Offered

Master of Science: Geography

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Science: Option A
Option B

See page 110 for descriptions of available options.

Core Requirements

Students are expected to take the following courses:

Geog 710 Evolution of Geographic Thought	2
Geog 712 Introduction to Graduate Study	2
Geog 714 Research and Writing	2

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Geography (Geog) Course Offerings

506 Seminar in Systematic Geography: (Topical) 1-4

Addresses one or more aspects of human, economic, physical, population and historical geography or techniques. May be repeated for credit. Topics vary each semester.

610 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.

620 Advanced Regional Studies in Geography: (Topical)1-4
 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.

700 Seminar in Geography: (Topical).....1-4
 Studies in selected geography fields. This course may be repeated for credit. The specific topic to be studied will change each semester.

710 Evolution of Geographic Thought2
every third semester
 The history and development of geography and its theories, schools of thought, and current ideas.

712 Introduction to Graduate Study2
every third semester
 Introduction to the nature, scope, and applications of geography as a discipline and to numerous practical concerns including geographic literature, schools of thought, and vocational opportunities.

714 Research and Writing2
S
 Development of geographic research and writing skills including a survey of data sources and literature, and preparation of reports, papers, articles, and the masters thesis. Alternate semesters, alternate years.

732 Geomorphology.....3
S, odd years
 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.

734 Climatology3
S, even 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.

742 Cultural Geography3
every third semester
 Consideration of culture in a geographic context including such concepts as cultural origins and diffusion, ecology, landscapes, and regions.

752 Urban Geography3
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.

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.

770 Advanced Geographic Techniques: (Topical)1-4
 Selected geographic techniques such as cartography, aerial photograph interpretation, remote sensing, information systems and map interpretation.

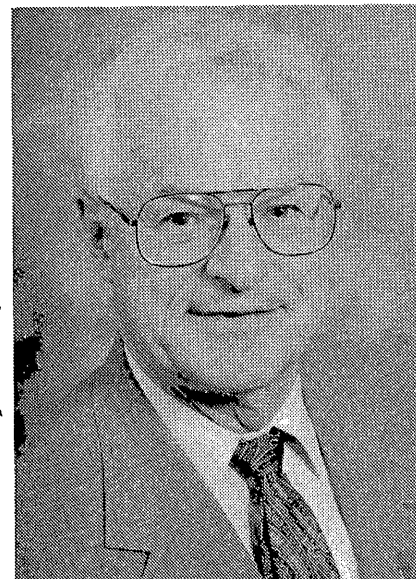
785 Quantitative Methods in Geography3
F
 Descriptive and Inferential Statistics will be studied in this course. The traditional regression and correlation routines will be addressed as well as probabilities. Statistical routines on the mainframe computer will be utilized in problem solving involving real-world geographic-sociological situations.

Key to Course Descriptions

Course Number and NameCredits
 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.



Charles F. Gritzner, Graduate Coordinator Geography

**Geographic Information Systems
Core Requirements**

Geog 506 Seminar in Systematic Geography: (Topical)	3
Geog 700 Seminar in Geography: (Topical)	3
CSc 630 Principles of Data Base System Design	3

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.	
790 Thesis, MS	1-6
791 Thesis Sustaining, MS	0
792 Special Problems in Geography: (Topical)	1-4
Selected studies in geography to meet the needs of advanced students. Written permission of department head.	
793 Internship	1-3
Internship activity which promises to contribute significantly to the education of the student. Student will intern with various agencies such as the EROS Data Center, various planning agencies, etc. P, availability of internship openings.	
794 Research Paper in Geography	1-3
P, written permission of department head.	

Planning (Plan) Course Offerings

571 Principles of State, Regional and Community Planning	3
F	
Purpose, structure, and dynamics of the planning process. Identification of different types of planning. Interdependencies 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.	
572 Techniques of State, Regional and Community Planning	3
S	
Brief review of basic approaches, procedures and methods employed within different phases of the planning process. Coordination required among persons trained in separate academic disciplines in order to carry out these basic techniques. Exercises in the practical application of selected techniques and review of their applications in on-going to completed planning efforts. P, Plan 571.	

Also refer to specialized courses in planning within departmental listings in: Economics; Education; Engineering; Geography; Horticulture, Forestry, Landscape and Parks; Political Science; and Sociology.

Gerontology

Mailing address: SDSU Box 2275A

Phone: 605/688-6418

Dean of Family and Consumer Sciences: Professor Laurie Stenberg Nichols
 Coordinator: Assistant Professor Renee Oscarson

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.

Major Degrees Offered

Master of Science: Not available

Doctor of Philosophy: Not available

Minors offered: Gerontology

Core Requirements

Bio	525	Biology of Aging	.....3
HDCF	614	Adult Development	.....3
NFS	761	Nutrition of the Aged	.....3
Nurs	655	Health and the Older Adult	.....2
Pha	722	Therapeutics-The Geriatric Patient	.....2
CHRD	671	Counseling in Gerontology	.....3

Key to Course Descriptions

Course Number and NameCredits
 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.



Renee Oscarson, Coordinator
 Gerontology

Department of Health, Physical Education and Recreation

Graduate Faculty

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

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

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

Mailing address: SDSU Box 2820

Phone: 605/688-5625

Department Head: Professor Fred Oien
Graduate Coordinator: Associate Professor Patty Hacker

Program Description

The HPER Graduate Program exists to provide post-baccalaureate study opportunities leading to a Master of Science degree in Health, Physical Education, and Recreation. The department philosophy is that graduate study at the master's level should be somewhat general with all students taking a common core of courses. However, in keeping with the guidelines of our national accrediting agencies (the National Association for Sport and Physical Education, and the National Council for the Accreditation of Teacher Education), students are afforded the opportunity to concentrate their studies in one of three areas of emphasis: 1) exercise physiology, 2) sports medicine, 3) sport pedagogy: (administration/management or teaching/coaching). Our goal is to provide students with knowledge and experiences which will make them better professionals or which will prepare them for advanced study at the doctoral level.

Major Degrees Offered

Master of Science: Health, Physical Education and Recreation

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Science: Option A
Option B
Option C

See page 110 for descriptions of available options.

Core Requirements

HPER 783	Research Methods in HPER.....	3
STAT 541	Statistical Methods II	3
HPER 780	Seminar in HPER I and II	2

Additional Admission Requirements

GRE: Required - Department requirement of 900 combined scores.
(verbal and quantitative)
TOEFL: Department requirement of 525

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Health, Physical Education and Recreation (HPER) Course Offerings

581 Workshops in HPER	1-3
Lectures, conferences, field experiences designed to increase or supplement knowledge in a specific area. Writing experience and oral examination required. Maximum of 2 credits allowed. P, consent.	
682 Seminar in HPER	2
Courses designed to address current topics or issues in the discipline.	
742 Psychological Aspects of Sport and Exercise	3

F, even years
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.



Fred Oien, Department Head
Health, Physical Education and Recreation

743 Basic Issues in HPER2
Su
 Seminar-style course which addresses current topics and issues in the discipline and profession. Directed reading and critical analysis of current literature in the field. P, consent. Alternate years.

745 Sports Medicine2
S, even years; Su, odd years
 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. Alternate years.

760 Motor Learning and Development3
 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. Alternate years.

765 Athlete Profiling2
S
 Application of current assessment techniques to understand the physiological, psychological, sociological, and motor dimensions of elite athletes. Case study approach. Laboratory work. Alternate years.

780 Seminar in HPER1
 Two credits are required. Exploration of current research in HPER. Development of research ideas/proposals. Sharing and critiquing of proposals and findings. Development of critical thinking skills will be emphasized. Pass/Fail.

783 Research Methods in HPER3
F
 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, consent.

790 Thesis, MS1-5

791 Thesis Sustaining, MS0

792 Individual Research and Study in HPER.....1-3
 Opportunity for students to investigate specific problems or areas not covered by coursework. Written report and oral examination required. Written proposal must be submitted before enrolling. P, consent.

Physical Education (PE) Course Offerings

550 Clinical Exercise Physiology2
S, Su
 Clinical exercise physiology assessment and prescription techniques appropriate to special populations. P, consent. Alternate years.

730 Physical Education Teacher Education.....2
S, odd years
 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.

731 Curriculum Development in Physical Education2
S, Su
 Practical application of physical education curriculum theory and philosophy to construction and evaluation of curriculum in physical education. Includes in-depth study of current research, program models, legal implications and issues. P, consent. Alternate years.

732 Analysis and Strategies of Teaching and Supervising PE and Sport3
S, even years, Su, odd years
 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. Alternate years.

Key to Course Descriptions

Course Number and NameCredits
 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.



*Patty Hacker, Graduate Coordinator
 Health, Physical Education and Recreation*

733 Middle Level Physical Education	2
<i>S,Su</i>	
Reading and discussion leading to application of current research in middle level education to teaching middle level physical education. P, consent. Alternate years.	
750 Applied Exercise Physiology	3
<i>F</i>	
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.	
751 Laboratory Techniques in Exercise Physiology	2
Provides the student with knowledge and skills required to perform standard physiological procedures utilized in a Human Performance Laboratory. P, consent. Alternate years.	
770 Advanced Administration of Interscholastic Athletics	2
<i>S (even years), Su (odd years)</i>	
Budgets, public relations problems, subsidization, objectives of athletics, staff organization, control of athletics, both interscholastic and intercollegiate, and general policies of athletics. P, consent. Alternate years.	
771 Current Trends in Athletics	3
<i>S, odd years, Su odd years, (2,1)</i>	
The study of trends in athletics that affect the performance, safety, and attitude of athletes; administrative practices; and public perception and support of athletics. Alternate years.	
772 Seminar: Financial Aspects of Sports Management	2
<i>F,Su</i>	
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. Alternate years.	

Department of History

Mailing address: SDSU Box 504

Phone: 605/688-4311

Department Head: Professor Rodney Bell
 Graduate Coordinator: Professor Rodney Bell

Major Degrees Offered

- Master of Science: Not available
- Doctor of Philosophy: Not available
- Minors offered: History

History (Hist) Course Offerings

560 Topics in History 1-4

An intensive examination of major historical themes, issues, or problems. Topics will include, but are not limited to, the following: War and Society; The Hero in History, Republics and Self Government, The Early Church and Rome.

592 Special Problems in History 1-3

Selected studies for advanced students.

Graduate Faculty

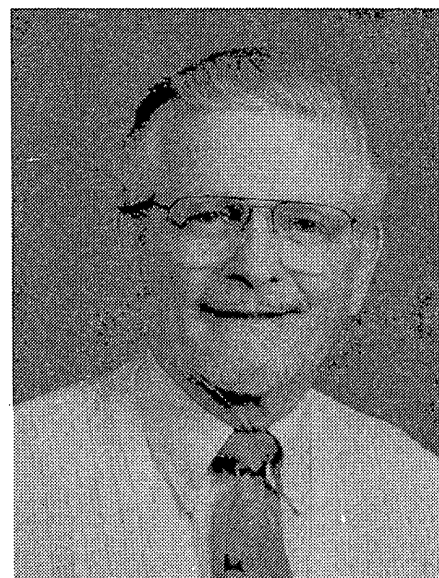
Rodney Bell
 Professor
 Ph.D., University of Michigan-Ann Arbor, 1975
 Ancient, Medieval

David Crain
 Professor
 Ph.D., Indiana University-Bloomington, 1972
 Latin America, Germany

Michael Funchion
 Professor
 Ph.D., Loyola University-Chicago, 1973
 England, Immigration

John Miller
 Professor
 Ph.D., University of Wisconsin-Madison, 1973
 Recent United States

Jerry Sweeney
 Professor
 Ph.D., Kent State University, 1970
 Diplomatic, Military



*Rodney Bell, Department Head
 History*

Department of Human Development, Consumer and Family Sciences

Graduate Faculty

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

Linda Good
Associate Professor
Ph.D., University of Minnesota, 1990
Early Childhood Education

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

Delores Kluckman
Associate Professor
Ed.D., Oregon State University, 1979
Education

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

Gail Dobbs Tidemann
Associate Professor
Ph.D., University of Alabama, 1986
Human Development, Extension Education



*Mary Kay Helling, Department Head
Human Development, Consumer and Family
Sciences*

Mailing address: SDSU Box 2275A

Phone: 605/688-6418
Fax: 605/688-4888

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

Program Description

Courses offered in Human Development, Consumer and Family Sciences support the Master of Science in Family and Consumer Sciences degree program. Students may emphasize Early Childhood Education, Family and Consumer Sciences Education or Human Development and Family Studies as their area of emphasis or a general departmental emphasis.

Major Degrees Offered

Master of Science: Family and Consumer Sciences, with an area of study in Human Development, Consumer and Family Sciences

Doctor of Philosophy: Not available

Refer to College of Family and Consumer Sciences section, page 58, for specific details.

Consumer Affairs (CA) Course Offerings

592 Special Problems	1-3
Problems selected according to students' special needs and interests. Consent of instructor.	
593 Current Topics	1-3
For students needing additional study of a topic or experience not offered as part of a regular class.	
792 Special Problems	1-3
793 Current Topics	1-3

Human Development, Consumer and Family Sciences (HDCT) Course Offerings

592 Special Problems	1-3
Individual study for qualified students. P, consent.	
593 Current Topics	1-3
Study of current issues and concerns in human development, family therapy, and family studies. Focus on topics not included in other graduate courses in the department. P, consent. Can be repeated.	
614 Adult Development	3
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.	
665 Parent Education: Theory and Issues	3
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. Alternate years.	

676 Early Childhood Education, Administration and Practicum	1-4
<i>on sufficient demand</i>	
Field experience with early childhood education (teaching, supervising, and administration). P, HDCF 327, 361, 362, 364, departmental consent.	
702 Seminar	1-3
<i>on sufficient demand</i>	
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.	
711 Child Development Theory and Application	3
<i>Su</i>	
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.	
742 Family Relations	3
<i>F</i>	
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.	
753 Family Public Policy	3
<i>F or S</i>	
The impact of the professional in shaping family policy and effecting positive family policy formation; study of family policy priority issues and alternative strategies. Alternate years.	
777 Child and Family Counseling	3
<i>S or Su</i>	
Theory and philosophy of counseling and therapy with children and families using a family systems approach. P, instructor consent.	
792 Special Problems	1-3
Individual study for qualified students. P, consent.	
793 Current Topics	1-3
Study of current issues and concerns in human development, family therapy, and family studies. Focus on topics not included in other graduate courses in the department. P, consent. Can be repeated.	

Key to Course Descriptions

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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.

Department of Journalism and Mass Communication

Graduate Faculty

Richard W. Lee
Professor
Ph.D., University of Iowa, 1972
Media Law, Media History, Community Newspapers

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

Mailing address: SDSU Box 2235

Phone: 605/688-4171

Department Head: Professor Richard Lee
Graduate Coordinator: Professor Lyle D. Olson

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 mass communication.

Major Degrees Offered

Master of Science: Communication Studies and Journalism
(see also Communication, Studies and Theatre)

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Science: Option I: Communication Studies
Option II: Journalism

Option Descriptions

Option I: 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.

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

See page 110 for descriptions of available options.

Core Requirements

- MCom 792 Research Methods in Communications
- GCom 605 Current Approaches to Communication
- SPCM 700 Instructional Methods in Communications (for teaching assistants)

Additional Admission Requirements

- GRE: Not required
- TOEFL: Department requirement of 550

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

General Communication (GCom) Course Offerings

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

Journalism and Mass Communication (MCom) Course Offerings

505 Theories of Communications	3
Major theories of communication, including media and interpersonal communication.	s



*Richard Lee, Department Head
Journalism and Mass Communication*

506 Public Opinion and Propaganda3
S
 Formation and measurement of public opinion; the role of the media; propaganda techniques, agencies, theories. P, consent.

515 Editorial Writing and Policy2
F
 Opinion function of periodicals; great editorials and editorial writers; writing editorials; shaping policy.

516 Mass Media in Society3
S
 Rights and responsibilities of the press; relation of the media to individuals and society; role of media in a free society.

537 Educational Radio and Television3
 Preparation, presentation of educational and instructional materials for radio, TV, and film and classroom use. Cross-listed with RTVF 537.

575 Public Relations3
S
 Interpreting institutional and industrial policies and programs to the public.

581 Media Administration and Management3
F
 Business practices, newspaper, magazine and broadcast management.

653 Workshop in Communications1-4
Su
 Understanding and using media in the classroom; supervising school publications. For high school or college instructors and publication advisers.

751 Special Problems in Communications1-3
 Individual research and study in communication. May be repeated to a total of four credits in problems courses. P, consent.

790 Thesis, MS1-7

791 Thesis Sustaining, MS0

792 Research Methods in Communications3
S
 Application of social science research methods and techniques to the study of interpersonal and mass communication. Elementary statistical procedures.

Key to Course Descriptions

Course Number and NameCredits
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.



**Lyle D. Olson, Graduate Coordinator
 Journalism and Mass Communication**

Department of Mathematics and Statistics

Graduate Faculty

Larry F. Bennett
 Professor
 Ph.D., University of Oklahoma, 1970
 Mathematical Analysis, TEX

Ross Kindermann
 Professor
 Ph.D., University of Illinois-Urbana, 1978
 Probability, Stochastic Processes

Robert J. Lacher
 Professor
 D.A., University of Northern Colorado, 1971
 Topology, Statistics, Quality

Jan Vandever
 Professor
 Ph.D., University of North Dakota, 1976
 Measurement and Statistics

Kenneth Yocom
 Professor
 Ph.D., University of Wyoming, 1972
 Number Theory, Abstract Algebra

Mailing address: SDSU Box 2220

Phone: 605/688-6196

Fax: 605/688-5880

E-mail: lacherr@mg.sdstate.edu

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

Program Description

The Master of Science in Mathematics prepares graduates for positions in industry, teaching, or doctoral programs. The Master of Science Teaching in Mathematics prepares graduates for teaching mathematics and science at the secondary level.

Major Degrees Offered

Master of Science: Mathematics

Master of Science Teaching (MST): Mathematics (as of 7/1/96 no new students)

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Science: Option A
 Option B
 Option C (M.S.T.)

See page 110 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

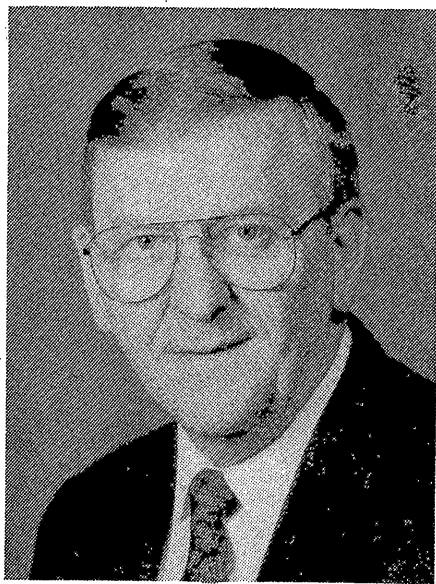
Additional Admission Requirements

GRE: Not required
 TOEFL: Department requirement of 550

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Mathematics (Math) Course Offerings

521 Advanced Calculus I	3
Elementary topology of \mathbb{R} and \mathbb{R}^n , continuity, differentiation and integration in \mathbb{R} and \mathbb{R}^n , infinite series of real numbers, uniform convergence. P, Math 225.	F
522 Advanced Calculus II	3
Power series, improper integrals, calculus of transformations from \mathbb{R}^n to \mathbb{R}^n , differential forms, vector analysis. P, Math 521.	S
561 Intro to Topology	3
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.	S



Kenneth Yocom, Department Head
 Mathematics and Statistics

Key to Course Descriptions

Course Number and NameCredits
 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.

566 Projective Geometry3
S, on demand
 A synthetic and/or analytic approach to geometric properties invariant under projective transformations: Theorems of Desargues, Pascal, Brianchon and applications. P, Math 224 or consent of instructor.

571 Numerical Analysis3
F, Su
 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.

593 Special Topics1-3
 Topics of current interest not included in regular course offerings.

672 Numerical Analysis3
S
 Continuation of Math 571 including approximation theory, matrix iterative methods and boundary value problems for ordinary and partial differential equations. P, Math 571.

700 Seminar1
 Current Topics in Mathematical Research. Pass/Fail grading.

716 Theory of Algebraic Structures I3
F
 Abelian Groups, homomorphisms, permutation groups, Sylow theorems, group representations and characters. P, Math 313.

717 Theory of Algebraic Structures II3
S
 Rings, Modules, Fields, Galois theory, solvable groups, commutative rings and modules. P, Math 716.

726-727 Real Variables I, II3
F, 726; S, 727
 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.

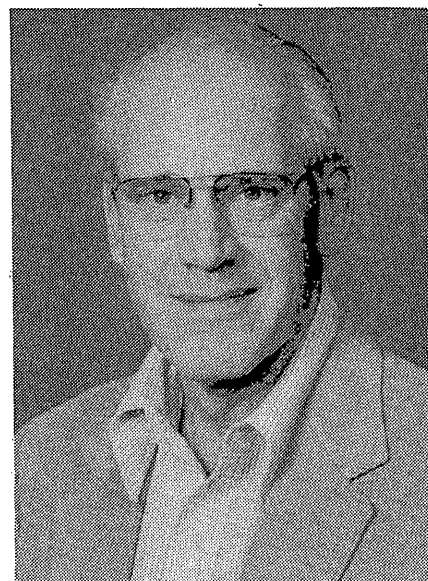
728 Complex Variables I3
F
 Algebra of complex numbers, classifications of functions, differentiation, integration, mapping, transformations, infinite series. P, Math 225.

729 Complex Variables II3
S
 Continuation of Math 728, Laurent series, calculus of residues, conformal mapping, analytic continuation, Riemann surfaces, infinite products, special functions. P, Math 728.

731 Ordinary Differential Equations3
S
 Existence theorems for solutions of ordinary differential equations, theory of linear differential equations and systems of linear differential equations oscillation theory. P, Math 321.

732 Partial Differential Equations3
F
 Series, solutions, total differential equations, simultaneous equations, approximate solutions, partial differential equations of first and second orders, application. P, Math 321.

770 Numerical Linear Algebra3
S
 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.



Robert Lacher, Graduate Coordinator
 Mathematics and Statistics

784 Applied Probability Theory	3
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.	
790 Thesis, MS	1-7
791 Thesis Sustaining, MS	0
792 Research Paper	2
793 Advanced Topics	1-3
794 Research Paper Sustaining	0
795 Special Problems	1-3
797 Research	1-9

Statistics (Stat) Course Offerings

541 Statistical Methods II	3
Analysis of variance, various types of regression, and other statistical techniques and distributions. Sections offered in the areas of Biological Science and Social Science. P, Stat 341 or Math 381. Credit not given for both Stat 541 and Stat 581.	
545 Nonparametric Statistics	3
Covers many standard nonparametric methods of analysis. Methods will be compared with one another and with parametric methods where applicable. Attention will be given to: (1) analogies with regression and ANOVA; (2) emphasis on construction of tests tailored to specific problems; and (3) logistic analysis. P, Stat 341 or Math 381.	
581 Statistics for the Physical Sciences	3
Analysis of variance, various types of regression, and other statistical techniques and distributions. P, Math 381. Credit not given for both Stat 541 and Stat 581.	
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. P, Stat 341 or Math 381. Cross-listed with ME 662.	
751 Interpretation of Statistical Software Output	2
Interpretation of statistical software package(s) include statistics such as correlation, means, standard deviation, standard error, t-test, chi-square, simple and multiple linear and curvilinear regression, and balanced and unbalanced analysis of variance. P, Stat 541 or Stat 581, CSc 210 or 410 or consent of instructor.	
761 Experimental Design	3
Experimental designs involving confounding, factorial experiments, incomplete block, lattice, incomplete latin square designs, combining experiments, and discriminant analysis. P, Stat 541 or Stat 581.	
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. Max of 6 students. P, Stat 541 or Stat 581.	

Department of Mechanical Engineering

Mailing address: SDSU Box 2219

Phone: 605/688-5426
Fax: 605/688-5878

Department Head: Professor Don Froehlich
Graduate Coordinator: Professor Don Froehlich

Program Description

The Mechanical Engineering Department offers courses for the degree Master of Science in Engineering. Also, course offerings can be used in co-major or minor programs for students of other departments. The graduate program in engineering with a study area of M.E. emphasizes advanced study, including design and research, in such areas as thermofluid science, solid mechanics and dynamics, and industrial and quality control engineering. Students are encouraged to broaden their education by participating in supporting programs in established departments such as mathematics, computer science and other fields of engineering.

Major Degrees Offered

Master of Science: Engineering, with coursework in Mechanical Engineering

Doctor of Philosophy: Not available

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 540

Refer to College of Engineering section, page 53, for specific details.

Mechanical Engineering (ME) Course Offerings

- 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 or consent.
- 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.
- 540 Computer-Aided Design**3
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. Emphasis on extending the designer's potential and not on automating activities. P, competence in FORTRAN programming and consent.
- 590 Special Problems**1-5
- 593 Special Topics**1-3
- 603 Thermo-Fluid Energy Systems**3
Review of viscous fluid, basic modes of heat transfer, and thermo-dynamic 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.
- 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.

Graduate Faculty

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

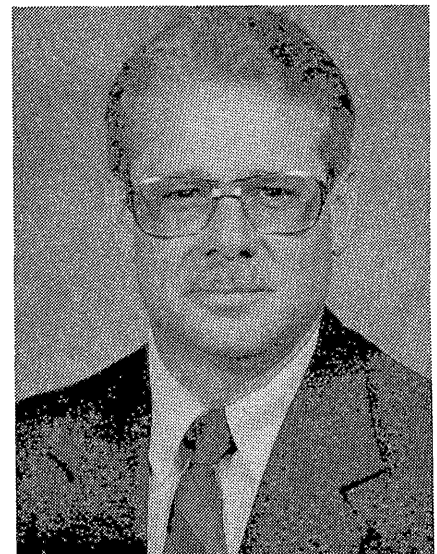
Donell Froehlich
Professor
Ph.D., Cornell University, 1976
Industrial, Mechanical Design

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

Hamid Hamidzadeh
Professor
Ph.D., Imperial College, 1978
Mechanics, Dynamic Systems

Alexandros Moutsoglou
Professor
Ph.D., University of Missouri-Rolla, 1977
Fluids, Thermodynamics

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



*Don Froehlich, Department Head
Mechanical Engineering*

Key to Course Descriptions

Course Number and NameCredits
 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.

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.	
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.	
621 Viscous Flow Theory 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.	
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.	
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.	
635 Modeling and Simulation of Dynamic Systems	3
(2,3) 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.	
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.	
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.	
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.	
661 Introduction to 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.	
662 Quality Control	3
Application of statistical techniques to the control of quality and the development of economical inspection methods. Collection analysis, and interpretation of operations data; control charts and sampling procedure. Cross-listed with Stat 662.	

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.	
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.	
667 Decision Theory	3
Examination and evaluation of modern techniques of decision making. Mathematical models and measurement theory. Certainty, risk, and uncertainty.	
690 Special Problems	1-5
Provides an opportunity for study or investigation of special problems or project at graduate level. P, or consent.	
695 Special Topics	1-3
700/701 Seminar	0-1
790 Thesis, MS	1-7
791 Thesis Sustaining, MS	0
792 Research Report/Design Paper	2
793 Research Report/Design Paper Sustaining	0
794 Special Problems	1-3
795 Special Topics	1-3
797 Research	1-9

Department of Music

Graduate Faculty

Corliss Johnson
Professor
D.M.A., University of Colorado-Boulder,
1972
Music Literature and History, Clarinet,
Saxophone

Key to Course Descriptions

Course Number and NameCredits
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.

Mailing address: SDSU Box 2212

Phone: 605/688-5187

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

Major Degrees Offered

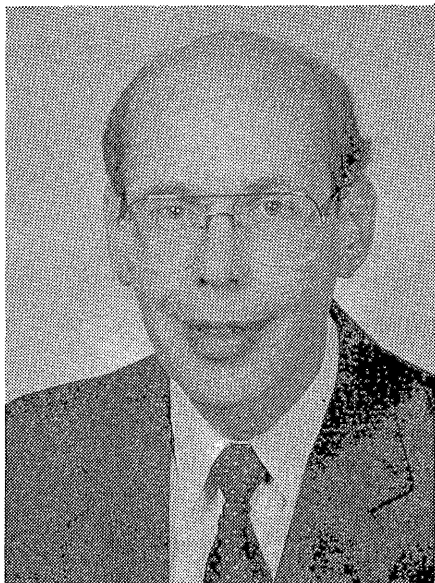
Master of Science: Not available

Doctor of Philosophy: Not available

Minors offered: Music

Music (Mus) Course Offerings

592 Independent Studies	1-3
593 Course Specials	1-5



Corliss Johnson, Department Head
Music

Mailing address: SDSU Box 2275

Phone: 605/688-4114

Dean: Professor Roberta K. Olson

Graduate Nursing Department Head: Professor Barbara S. Heater

Master of Science in Nursing

The purpose of graduate education in nursing is to prepare professional leaders with specialized knowledge and skills to meet the nation's needs in clinical practice, nursing administration, and nursing education. The aim of the program is to prepare nurses to practice at an advanced level in nursing in the functional roles of either nurse educator, administrator, or clinician which includes clinical nurse specialist or family nurse practitioner. Achievement of this aim includes study in related fields and the use of research in the examination of nursing problems. Students focus on the clinical tracks of adult/gerontology or family/parent-child.

Available Options for Graduate Degrees

Master of Science: Option A
 Option B

See page 118 for descriptions of available options.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 525.

In addition to meeting basic requirements for admission to the Graduate School, applicants for graduate study in nursing must have:

1. Applicants for the M.S. in Nursing must also submit an additional application to the Nursing program and the Immunization and Physical Examination Form. These documents may be requested from the College of Nursing, SDSU Box 2275, (605) 688-4114.
2. Bachelor's degree in nursing from an NLN accredited program with an upper division major in nursing with a "B" average (3.0 or higher on a 4.0 point grading system).
3. Current licensure as an RN in South Dakota or eligibility for licensure.
4. Professional nursing liability insurance.
5. One year of nursing practice experience.
6. A course in physical assessment or documented skills in this area (evidenced by test or transcript).
7. A course in statistics, including descriptive and inferential statistics.

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

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. Practice at an advanced level in the role of clinical nurse specialist, educator, family nurse practitioner or administrator.
3. Evidence competency in evaluation, conduct and utilization of research in advanced nursing practice.
4. Use leadership, administrative, and teaching strategies to change nursing practice and health care.
5. Assume accountability to influence health policy, improve health care delivery, and advance the nursing profession.

Graduate Faculty

Kay Foland

Assistant Professor

Ph.D., University of Texas-Austin, 1989

Barbara S. Heater

Professor

Ph.D., St. Louis University, 1984

Margaret Hegge

Distinguished Professor

Ed.D., University of South Dakota, 1983

Sharon Hofland

Professor

Ph.D., South Dakota State University, 1976

William McBreen

Associate Professor

Ph.D., University of Texas-Austin, 1989

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

Assistant Professor

Ph.D., University of Washington, 1994

Dianna Sorenson

Associate Professor

Ph.D., University of Arizona, 1990

Required Courses for All Students

- Nurs 610 *Advanced Nursing Practice: Role Introduction and Issues*
- Nurs 623 *Physiological Response Patterns in Health and Illness*
- Nurs 631 *Advanced Assessment Across the Lifespan*
- Nurs 670 *Health Policy, Legislation, Economics and Ethics*
- Nurs 695 *Special Topics: Advanced Nursing Research*
- Nurs 760 *Advanced Nursing: Health and Communication*
- Nurs 765 *Advanced Practice: Complex Health Problems*

Elective Support Courses

- Nurs 645 *Management of Acute and Chronic Pain*
- Nurs 710 *Curriculum Development in Nursing*
- Nurs 725 *Patient Care Management*

Functional Role Courses

- Nurs 770 *Clinical Nursing Specialization*
- Nurs 771 *Clinical Specialization for Family Nurse Practitioner*
- Nurs 775 *Nurse Role Practicum Nursing Education Section Management Section Nurse Practitioner Practicum in Ambulatory Care*

Required Courses, 2 Research Options

- Nurs 790 *Thesis*
or
- Nurs 792 *Problems in Nursing Research*
- Nurs 791 *Thesis Sustaining*
or
- Nurs 795 *Problems in Nursing Research Sustaining*

Elective Support Courses

- Nurs 625 *Human Sexuality in Health Care*
- Nurs 635 *Death and Dying: Principles and Practice of Care*
- Nurs 640 *Legal and Ethical Accountability in Health Care*
- Nurs 655 *Health and the Older Adult*
- Nurs 665 *Health Care for Victims of Abuse*
- Nurs 692 *Special Problems*
- Nurs 695 *Special Topics*
- Nurs 780 *Seminar in Advanced Nursing*
- Nurs 785 *Self Care of the Older Adult*

Core Requirements

- Nurs 610 *Advanced Nursing Practice: Role Introduction and Issues*
- Nurs 623 *Physiological Response Patterns in Health and Illness*
- Nurs 631 *Advanced Assessment Across the Lifespan*
- Nurs 670 *Health Policy, Legislation, Economics and Ethics*
- Nurs 695 *Special Topics: Advanced Nursing Research*
- Nurs 760 *Advanced Nursing: Health and Communication*
- Nurs 765 *Advanced Practice: Complex Health Problems*

Functional Role Courses

- Educator** Nurs 710, Curriculum Development in Nursing
Nurs 775, Nurse Role Practicum, Nursing Education Section
- Administrator** Nurs 725, Patient Care Management
Nurs 775, Nurse Role Practicum, Administrative Section
- Clinical Specialist** Nurs 645, Management of Acute and Chronic Pain
Nurs 770, Clinical Nursing Specialization
- Family Nurse** Pha 645, Pharmacotherapeutics:
Application to Advanced Practice
- Practitioner** Nurs 771, Clinical Specialization for FNP's
Nurs 775, Nurse Role Practicum, Family Nurse Practitioner Section

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Health Science (HSc) Course Offerings

533 Industrial Hygiene3

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

610 Advanced Nursing Practice: Role Introduction and Issues3

Introduction to advanced nursing practice. Theoretical bases for education, management and clinical practice roles and research as a basis for advanced practice will be emphasized. Health care delivery systems, economic impacts, work management, ethics and leadership will be addressed. Change theory and application, and communication skills with professionals and consumers (individuals and groups) will be included.

623 Physiological Response Patterns in Health and Illness4

(CNS, FNP, and ED required; Admin can take as elective) Normal developmental physiology and pathophysiology will be covered with emphasis on clinical nursing problems of the major body systems. Normal growth and development throughout the life span will be studied. Interruptions due to disease processes are emphasized.

625 Human Sexuality in Health Care3

Provides the opportunity to identify, study and discuss those areas in human sexuality which concern human interaction and in particular the work with clients and their families in health care. P, graduate student in nursing; graduate student in other disciplines with consent of instructor.

631 Advanced Assessment Across the Lifespan.....2

This course builds upon basic skills of individual health assessment. It includes assessment of physiological and psychosocial processes relevant to all age groups. (1,3)

635 Death and Dying: Principles and Practice of Care3
 Provides an opportunity to identify and discuss issues surrounding death and ways in which health professionals may provide appropriate care for the dying person and family.

640 Legal and Ethical Accountability in Health Care2
 Study of the ethical positions and legal factors influencing behavior and decision making in health care. Emphasis on developing a justifiable ethical framework with consequent rights, responsibilities and conflicts. P, graduate students in nursing and other health professionals with instructor's consent.

645 Management of Acute and Chronic Pain3
 Provides opportunity to identify and discuss management principles of acute and chronic pain with noninvasive and invasive measures. P, graduate nursing student, other graduate students with instructor's consent.

655 Health and the Older Adult2
 Issues and factors affecting the older adult will be analyzed for their implications in planning and implementing health care for this group. A guided study approach to a conventional course. P, senior or graduate nursing student, graduate or senior student of other health disciplines, or consent of the instructor. Required for Gerontology Emphasis.

665 Health Care for Victims of Abuse3
 Opportunities to study the historical perspectives of health care for the victim; to assess the current physical, psychological and emotional health care needs of the victim; to plan and implement intervention procedures and to evaluate the treatment modes in appropriate health care facilities. P, Psyc 101, Soc 100, senior or graduate nursing student, graduate or senior student of other health disciplines or consent of instructor.

670 Health Policy, Legislation, Economics and Ethics3
 Legal, ethical, and political issues related to health policy that impact advanced nursing practice will be studied. Rural and urban health care issues will be emphasized. Change agent strategies designed to impact current state and national legislation will be applied. Utilization of professional associations will be included. Philosophical principles of biomedical ethics will be introduced for advanced nursing practice.

690 Seminar: Guided Study in Nursing1-4
 Investigation of a selected problem in nursing theory or practice. May be repeated for two semesters for variable credit.

692 Special Problems1-3
 Directed study, analysis and/or research of selected problems related to clinical practice in nursing. May be a combination of discussion/conference and clinical experience. Open to qualified nursing graduate students by consent. Limit of 4 credits of special problems Nurs 692/792 can be applied to a degree.

695 Special Topics1-3
 Review and discussion of special concerns, issues or trends in the nursing profession, such as, but not limited to, legislation, ethics, administration, education. Topics will be of a non-clinical nature. Open to qualified nursing graduate students by consent. Limit of 3 credits can be applied to a degree.

710 Curriculum Development in Nursing2
 Principles of curriculum development and their application to nursing curricula. Selection, organization and evaluation of learning experiences. P, or concurrent, Nurs 610, or consent of instructor.

725 Patient Care Management3
 Identification and analysis of management theories influencing middle management nursing roles in a variety of patient care situations. P, or concurrent, Nurs 765, Nurs 782, or consent of instructor.

Key to Course Descriptions

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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.



*Roberta K. Olson, Dean
 College of Nursing*

- 760 Advanced Nursing: Health and Communication**4
(2,6)
The development of nursing practice by application of scientific principles, generalization and concepts to complex nursing problems. Particular attention directed toward management of client relationship with the changed environment determined by his/her health status. P, or concurrent, Nurs 610.
- 765 Advanced Practice: Complex Health Problems**4
(2,6)
Concepts relevant to nursing focused on acute and chronic health deviations among individuals, families and groups are examined. Pathophysiology content and principles of ethics will be incorporated with advanced nursing role utilization for clinical application. Student goals relevant to selected functional and specialty areas will be basis for clinical experience. P, or concurrent, Nurs 610.
- 770 Clinical Nursing Specialization**6
(3,9)
Extension and refinement of professional expertise in a clinical field of the student's choice. P, completion of core requirements.
- 771 Clinical Specialization for Family Nurse Practitioner**6
(3,9)
Clinical diagnostic and therapeutic knowledge and skill through application of preventive, epidemiologic, pharmaceutical and nursing theory in clinical practice with families. Case management of a variety of clients in a collaborative health care practice is examined through classroom and clinical experiences. Gerontology content and patient care experiences are included. P, completion of core requirements.
- 775 Nurse Role Practicum**6-12
Supervised experience in nursing role:
Nursing Education Section. Teaching in classroom and/or clinical services, 6 (1,15). P, completion of core requirements.
Administrative Section. Nursing middle management in selected patient care settings, 6 (1,15). P, completion of core requirements.
Nurse Practitioner Practicum in Ambulatory Care. Supervised experience in nursing role. Application of clinical knowledge and skills in various health care settings by working interdependently with nurse and/or physical preceptors, 12 (3,27). P, Nurs 771.
- 780 Seminar in Advanced Nursing**1-3
Discussion and reports of current literature, practices, or research in nursing. P, consent. Limit of 3 credits applied to Master's degree.
- 785 Self Care of the Older Adult**3
Analysis of various factors which alter the self care of the older adult. A guided study approach to a conventional course. P, or concurrent, Bio 525. P, Nurs 695, Nurs 760, Nurs 655 (Required for Gerontology Emphasis).
- 790 Thesis, MS**1-5
P, Nurs 610, Nurs 695, Advanced Nursing Research.
- 791 Thesis Sustaining, MS**0
- 792 Problems in Nursing Research**1-2
Application of the nursing research process with particular emphasis on problems of inquiry in the health care system (Project or non-thesis option). P, Nurs 695, Advanced Nursing Research, regular admission status. P, or concurrent, Nurs 610. May be repeated up to two times for a maximum of two (2) credits.
- 795 Problems in Nursing Research Sustaining**0



Barbara S. Heater, Department Head
Graduate Nursing

Department of Nutrition and Food Science

Mailing address: SDSU Box 2275A

Phone: 605/688-5161

Department Head: Professor Marilyn A. Swanson
 Graduate Coordinator: Professor Marilyn A. Swanson

Program Description

Courses offered in Nutrition and Food Science support the Master of Science in Family and Consumer Sciences degree program. Students may select courses in Nutrition and Food Science as their area of study.

Major Degrees Offered

Master of Science: Family and Consumer Sciences, with an area of study in Nutrition and Food Science

Doctor of Philosophy: Not available

Refer to College of Family and Consumer Sciences section, page 58, for specific details.

Nutrition and Food Science (NFS) Course Offerings

- 590 Seminar in Food and Nutrition**1-2
 This seminar is designed to explore in depth topics related to the role of nutrition in health promotion and disease prevention in the community.
- 592 Special Problems**1-3
 Special study in food and nutrition. P, consent.
- 593 Current Topics**1-3
 Special course offerings on a topical basis stressing current state of knowledge on various topics. May be repeated for credit.
- 634 Techniques in Nutrition Research**3
 (1,6)
 Laboratory experience using methods, measurements and instruments for obtaining nutritional data. P, Chem 361 or consent.
- 660 Maternal and Infant Nutrition**3
 Fundamental principles of nutrition during pregnancy, lactation, infancy, and early childhood. Topics include stages of fetal development, maternal physiological and anatomical alterations, nutritional guidance in prenatal care, normal growth and development, food intake and its regulations. P, NFS 321 or consent.
- 662 Sociocultural Aspects of Nutrition**2
 The study of diverse dietary patterns and their impact on nutritional health including food attitudes, socioeconomic structures, cultural patterns of food intake and their effect on nutrient composition of the diet. P, NFS 221 or NFS 321 or consent.
- 725 Nutrition and Human Performance**3
 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.
- 760 Child Nutrition**3
 An intensive study of the nutrition of the human organism, beginning with prenatal nutrition and extending through adolescence. An evaluation of the factors affecting height and weight for age, muscular development, and the nutritional status. P, NFS 321 or consent.
- 761 Nutrition of the Aged**3
 Physiological and behavioral changes associated with aging and their impact on nutrition. Effect of nutrition on aging and lifespan. Common health problems of the aged and their implications. P, NFS 321 or consent.
- 792 Special Problems**1-3
 Special studies in Nutrition and Food Science. Consent.
- 793 Current Topics**1-3
 Special course offerings on current issues in the fields of Nutrition and Food Science. Consent.

Graduate Faculty

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

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

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

Madeleine S. Rose
 Associate Professor
 Ph.D., Texas Woman's University, 1985
 Nutrition/Dietetics

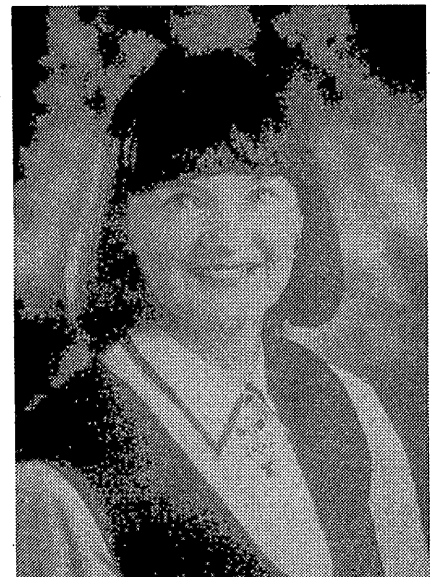
Marilyn A. Swanson
 Professor
 Ph.D., Washington State University, 1987
 Nutrition Education

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

Key to Course Descriptions

Course Number and NameCredits
 F = Fall
 S = Spring
 Su = Summer
 (Lecture Hours, Lab Hours)

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



*Marilyn A. Swanson, Department Head
 Nutrition and Food Science*

College of Pharmacy**Graduate Faculty**

Joye Billow
Professor
Ph.D., Temple University, 1972
Communications

Gary Chappell
Professor
Ph.D., University of Kansas, 1968
Medicinal Chemistry

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

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

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

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

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

Jane Mort
Professor
Pharm.D., University of Nebraska-Medical
Center, 1985
Geriatrics

James Powers
Professor
Pharm.D., University of Minnesota, 1983
Internal Medicine

Yadhu Singh
Associate Professor
Ph.D., University of Strathclyde, 1979
Pharmacology

Michael W. Smar
Associate Professor
Ph.D., The Ohio State University, 1988
Medicinal Chemistry

Mailing address: SDSU Box 2202C

Phone: 605/688-6198

Fax: 605/688-6232

Dean: Professor Danny Lattin
Pharmaceutical Sciences Department Head: Professor Gary Chappell
Clinical Pharmacy Department Head: Professor Brian Kaatz
Coordinator for Graduate Studies: Professor Chandradhar Dwivedi

Master of Science in Pharmaceutical Sciences

The purpose of the Graduate Program in Pharmaceutical Sciences is to provide the student an opportunity to gain high quality graduate and research experience in preparation for doctoral studies. For those students who choose not to continue further graduate studies, there are opportunities in pharmaceutical industry and government and research laboratories. Inactive status. As of July 1, 1996, admission for this program is discontinued.

Doctor of Pharmacy

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

Post-B.S. Degree Program: A Professional Degree for students who have completed the B.S. in Pharmacy degree. Students interested in this program should consult the undergraduate catalog for information. Admission for this program will be discontinued after Fall 1996.

Courses offered and applied towards this degree are listed on page 87.

Major Degrees Offered

Master of Science: Pharmaceutical Sciences (as of 7/1/96 no new students)

Doctor of Philosophy: Not available

Available Options for Graduate Degrees

Master of Science: Option A

See page 110 for descriptions of available options.

Additional Admission Requirements

GRE: Required

TOEFL: Department requirement of 550

Core Requirements

B.S., or equivalent, in Pharmacy, Physical, or Biological Sciences who have completed two semesters of general and organic chemistry and one semester of biochemistry. Minimum GPA is 3.0 on a 4.0 scale.

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Pharmacy (Pha) Course Offerings

645 Pharmacotherapeutics: Application to Advanced Practice	4
Current drug therapy principles with emphasis on drugs and pharmacotherapeutics used in Family Nurse Practitioner practice. P, FNP program enrollment.	
720 Advanced Medicinal Chemistry	3
Qualitative and quantitative aspects of the design of therapeutic agents. P, Pha 341 or consent.	
725 Topics in Medicinal Chemistry	3
Selected areas covering more advanced concepts in medicinal chemistry, new research techniques. P, Pha 341 or consent.	

- 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.
- 745 Topics in Pharmacology**3
A study of current advanced theories in pharmacology. P, Pha 443 or consent.
- 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.
- 765 Topics in Pharmaceutics**3
Selected areas covering more advanced concepts in pharmaceutics, new research techniques. P, Pha 415 or consent.
- 780 Seminar**1
(0,1)
Contemporary topics in the pharmaceutical sciences. Required of all graduate students in pharmaceutical sciences. Maximum of two credits.
- 790 Thesis in Pharmaceutical Sciences, MS**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.

**Pharmacy (Pha) Graduate Courses
offered and applied to the Doctor of Pharmacy program**

700 Directed Studies Clerkship	4	733 Therapeutics-Gastrointestinal and Nutrition	3
701 Home Health Care/Hospice Clerkship	4	734 Therapeutics-Endocrine/Reproduction	3
702 Indian Health Service Clerkship	4	735 Therapeutics-Infectious Disease	2
703 Pharmacy Administration Clerkship	4	736 Therapeutics-Neurology/Psychiatry	3
704 Nutrition Clerkship	4	737 Therapeutics-Cardiopulmonary	4
705 Clinical Research Clerkship	4	738 Therapeutics-Hematology/Oncology	3
706 Critical Care Clerkship	4	739 Therapeutics-Rheumatology/Skin/Skeletal	2
707 Infectious Disease Clerkship	4	741 Drug Utilization and Quality Assurance	1
708 Surgery Clerkship	4	742 Adverse Drug Reactions	2
709 Nephrology Clerkship	4	751 Immunotherapeutics	2
710 Pharmacokinetics Clerkship	4	752 Drugs of Abuse	2
711 Oncology Clerkship	4	753 Women and Children's Health	2
712 Nuclear Pharmacy Clerkship	4	755 Research Design and Drug Information	4
713 Managed Care Clerkship	4	760 Clinical Pharmacokinetics	3
714 Community Pharmacy	6	770 Pediatrics Clerkship	4
715 Pharmacy Physical Assessment	2	771 Geriatrics Clerkship	4
716 Institutional Pharmacy	6	772 Internal Medicine I Clerkship	4
718 Advanced Clinical Lab	3	773 Internal Medicine II Clerkship	4
719 Physical Assessment Lab	1	774 Ambulatory Care/Family Practice Clerkship	4
721 Immunotherapy	2	775 Psychiatry Clerkship	4
722 Therapeutics: The Geriatric Patient	2	784 Seminar I	1
723 Ethics in Healthcare Practice	2	785 Seminar II	1
724 Pharmacoeconomics	2	791 Directed Studies	1-3
728 Current Issues in Pharmacy Practice	3		
729 Pharmaceutical Marketing	2		
730 Advanced Pharmacotherapeutics I	6		
731 Advanced Pharmacotherapeutics II	6		
732 Therapeutics-Renal/Fluid and Electrolytes	3		



**Danny Lattin, Dean
College of Pharmacy**

Department of Physics

Graduate Faculty

John Kitterman
Associate Professor
Ph.D., Colorado State University, 1970
Condensed Matter

O. W. Leisure
Professor
M.S., South Dakota State University, 1966
Nuclear Physics

Oren Quist
Professor
Ph.D., University of Denver, 1973
Condensed Matter

Joel Rauber
Professor
Ph.D., University of North Carolina-Chapel
Hill, 1985
General Relativity, Computational Physics

Stephen J. Schiller
Associate Professor
Ph.D., University of Calgary, 1986
Astrophysics

Mailing address: SDSU Box 2219

Phone: 605/688-5428

Fax: 605/688-5878

Acting Department Head: Professor Oren Quist

Graduate Coordinator: Professor Oren Quist

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 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, remote sensing, image processing, condensed matter, materials science, and nuclear physics.

In addition, course work is offered in cooperation with the Biology, Mathematics and Statistics, and Chemistry Departments which leads to a Master of Science Teaching (MST) degree. This is a 35-credit, non-thesis program designed for secondary teachers who may be teaching in one or more of these four areas. The majority of course work is offered in the summer and teachers can complete the program in 3 summer sessions. As of July 1, 1996, this program is discontinued.

Major Degrees Offered

Master of Science: Engineering, with coursework in Physics

Master of Science Teaching (MST): Physics (as of 7/1/96 no new students)

Doctor of Philosophy: Not available

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

Refer to College of Engineering section, page 53, for specific details.

Physics (Phys) Course Offerings

533 Nuclear and Elementary Particle Physics3
F

Radioactivity, nuclear spectra and structure, nuclear models, elementary particle theories and high energy physics. P, Phys 471 or consent.

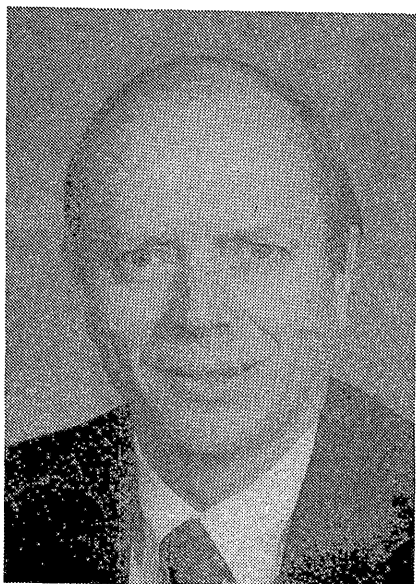
541 Science of Solids3
F

Topics covered to satisfy student interests in areas such as magnetism, semi-conductors, super-conductors, 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.

693 Special Topics1-3

700 Seminar0-1

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.



Oren Quist, Acting Department Head
Physics

721 Electrodynamics I	3
	<i>F</i>
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.	
723 Electrodynamics II	3
	<i>S</i>
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 magnetohydrodynamics. P, Phys 721.	
743 Statistical Mechanics	3
	<i>S</i>
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.	
751 Theoretical Mechanics	3
	<i>S</i>
Further development of Lagrangian and Hamiltonian methods, canonical transformations, rigid body motion, relativistic mechanics. P, Phys 351.	
771 Quantum Mechanics I	3
	<i>F</i>
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.	
773 Quantum Mechanics II	3
	<i>S</i>
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.	
775 Tensors and General Relativity	3
Covariance in physics, basic tensor algebra and calculus, affine connections, the Riemann tensor, field equations, linear approximations. The Schwarzschild solution. P, Phys 421 or consent.	
779 Group Theory in Quantum Mechanics	3
Symmetry transformations, continuous groups, finite groups, applications to valence theory, Lorentz group, fundamental particles. P, Phys 471.	
790 Thesis, MS	1-7
791 Thesis Sustaining	0
792 Research or Design Paper	2
793 Special Topics	1-3
795 Research or Design Paper Sustaining	0
797 Research	1-9

Key to Course Descriptions

Course Number and Name	Credits
	<i>F</i> = Fall
	<i>S</i> = Spring
	<i>Su</i> = Summer
	(Lecture Hours, Lab Hours)

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

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

**Physics
Core Requirements**

Phys 721	Electrodynamics I	.....3
Phys 723	Electrodynamics II	.....3
Phys 743	Statistical Mechanics	.....3
Phys 751	Theoretical Mechanics	.....3
Phys 771	Quantum Mechanics I	.....3
Phys 773	Quantum Mechanics II	.....3
Phys 700	Seminar	.....1

Department of Plant Science

Graduate Faculty

W. Eugene Arnold
Professor
Ph.D., North Dakota State University, 1970
Weed Control

Aroid 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

Tom Chase
Associate Professor
Ph.D., University of Vermont, 1986
Pathology - Row Crops

Fred Cholick
Professor
Ph.D., Colorado State University, 1977
Breeding - Spring Wheat

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

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

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

Paul Evenson
Professor
M.S., University of Nebraska-Lincoln, 1959
Statistics

Billy Fuller
Associate Professor
Ph.D., Louisiana State University, 1987
Entomology - Field Crops

Dale Gallenberg
Professor
Ph.D., Cornell University, 1984
Pathology - Extension

Ron Gelderman
Associate Professor
Ph.D., North Dakota State University, 1987
Soil /Plant Analysis

Mailing address: SDSU Box 2207A

Phone: 605/688-5121

Fax: 605/688-4602

E-Mail: evensonp@mg.sdstate.edu

WWW: <http://www.sdstate.edu/~wpls/http/pscihome.html>

Department Head: Professor Dale Gallenberg
Graduate Coordinator: Professor Paul Evenson

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.

Major Degrees Offered

Master of Science: Agronomy
Entomology
Plant Pathology

Doctor of Philosophy: Agronomy
Biological Sciences, with an area of study in Plant Science

Available Options for Graduate Degrees

Master of Science: Option A (Agronomy, Entomology, Plant Pathology)
Option B (Agronomy, non thesis)

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

See pages 110 (M.S.) and 113 (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: Department requirement of 525

Students must be accepted by an advisor before admission is granted.

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Plant Science (PS) Course Offerings

512 Soil Chemistry	3
Chemical interactions which influence transport, transformation, and plant availability of nutrients, biocides, and wastes/toxins in soils; sorption phenomena, chemical equilibria, ion selectivity, and more. P, PS 213 and Chem 120 or consent.	<i>S, odd years</i>
515 Mycology	3
Comprehensive taxonomic survey of the Kingdom Fungi; reproductive biology, physiology, genetics, and ecology of fungal organisms; relationship of fungi to human affairs. Cross-listed with Bio 515.	<i>F, odd years (2,3)</i>

520 Biological Control of Arthropods3*F, odd years (2,2)*

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, PS305 or equivalent, or consent of instructor.

531 Applied Insect Ecology3*S, odd years (2,2)*

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, PS305 or equivalent, or consent of instructor.

546 Agroecology3*S, 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, PS213 and Bio101 or consent.

553 Advanced Genetics3*F, even years*

Procedures in genetic studies as they relate to molecular and classical genetic applications. P, Bio 371. Cross-listed with Bio 553.

562 Prokaryotic-Eucaryotic Molecular Biology I2*F*

Charge, partitioning, migration of molecules; protein structure, enzymes; DNA structure and properties, prokaryotic 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. P, Micr 436, Chem 361, or consent. Cross-listed with Bio 562.

563 Prokaryotic-Eucaryotic Molecular Biology I Laboratory2*F (0,6)*

Isolation of plasmids; restriction analyses; DNA transfers and hybridization analyses; bacterial transformations of eucaryotic cells; amplification of DNA utilizing polymerase chain reactions (PCR); restriction fragment length polymorphism (RFLP) analyses; mRNA isolation; generation and amplification of bacteriophage cDNA libraries. P, Micr 436, Chem 361, or consent. Cross-listed with Bio 563.

564 Prokaryotic-Eucaryotic Molecular Biology II2*S*

Structure of the nucleus; endocytosis; genome of mitochondria and chloroplasts; cell growth and division; cancer; immune system; pattern formation; homeoboxes; intracellular transport; gene expression and regulation. P, Bio/PS 562 or consent. Cross-listed with Bio 564.

565 Prokaryotic-Eucaryotic Molecular Biology II Laboratory2*S (0,6)*

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/PS 562, 563, or consent. Cross-listed with Bio 565.

700 Special Topics1-6*(1-3 per topic)*

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
Phytopathology	Soil Mineralogy	Weed Science
Quantitative Genetics	Soil Physics	

704 Virus and Bacterial Disease of Plants4*F, even years (2,4)*

Plant diseases caused by viroids, viruses, bacteria and mycoplasma-like organisms including identification, development, symptoms, and control. Advanced laboratory research methods used in isolation, transmission, culture, purification, microscopy, serology and investigation of the nature and properties of important plant pathogens. P, consent. Alternate years.

Scott Haley

Assistant Professor

Ph.D., Colorado State University, 1992

Breeding - Winter Wheat

Yue Jin

Assistant Professor

Ph.D., North Dakota State University, 1990

Pathology - Small Grains

Paul Johnson

Assistant Professor

Ph.D., University of Wisconsin-Madison, 1992

Entomology - Systematics

Kevin Kephart

Associate Professor

Ph.D., Iowa State University of Science and

Technology, 1986

Forage Physiology

Robert Kohl

Professor

Ph.D., Utah State University, 1962

Soil Irrigation and Physics

Marie Langham

Associate Professor

Ph.D., Texas A&M University, 1986

Plant Pathology - Viruses

Douglas Malo

Professor

Ph.D., North Dakota State University, 1975

Soil Genesis/Classification

Murdick McLeod

Associate Professor

Ph.D., The Ohio State University, 1990

Entomology - Extension

Dale Reeves

Professor

Ph.D., Colorado State University, 1969

Breeding - Oats

Diane Rickerl

Professor

Ph.D., Auburn University, 1986

Agroecology

Jackie Rudd

Assistant Professor

Ph.D., Kansas State University, 1992

Breeding - Spring Wheat

Tom Schumacher

Professor

Ph.D., Michigan State University, 1982

Soil Physics and Conservation

Roy Scott

Associate Professor

Ph.D., Kansas State University of Agriculture

and Applied Science, 1987

Breeding - Soybeans

James Smolik
 Professor
 Ph.D., South Dakota State University, 1973
 Plant Pathology - Nematodes

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

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

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

Adjunct Faculty

Laurence Chandler
 Professor
 Ph.D., Texas A & M University, 1986
 Research Entomology

Michael Ellsbury
 Associate Professor
 Ph.D., University of Arizona, 1979
 Research Entomology

Paul Fixen
 Professor
 Ph.D., Colorado State University, 1979
 Soil Fertility

Leslie Hammack
 Assistant Professor
 Ph.D., University of Wisconsin-Madison, 1974
 Research Entomology



**Dale Gallenberg, Department Head
 Plant Science**

713 Host-Plant Pathogen Interactions3
S, odd years (2,2)
 Physiology and genetics and host-parasite interactions. Disease resistance. P, consent. Alternate years.

720 Insect Anatomy and Physiology3
S, odd years (2,2)
 Introduction to the internal anatomy of insects, and the principles of the physiology of insect cells, tissues, organs and systems. P, PS305, or equivalent or consent of instructor.

721 Integrated Crop Pest Management3
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.

722 Behavioral Management of Insects3
F, even years (2,2)
 Principals of insect behavior stressing the role of behavior in designing management tactics. Topics include direct exploitation of behavior for control, sub-lethal behavioral effects of pesticides, and the use of semiochemicals for population monitoring and mating disruption. Methods for sampling, measuring and evaluating insect behaviors will be examined. P, PS305, or equivalent or consent of instructor.

732 Field Studies in Pedology2
Su, even years
 Field techniques used in soil classification will be learned by studying soils developed in a variety of geological materials and surface formations 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. Students will share transportation, room and board costs. The class may be repeated for a maximum of 4 credits. P, PS/Geog 310 or consent of instructor. Physiographic divisions used as study areas will be rotated so that activities are unique each year.

733 Advanced Soil Genesis3
S, even years
 Detailed study of the processes of soil genesis and an examination of soil and ecosystems with respect to the soil forming factors of time, parent material, topography, climate and organisms. P, consent. Alternate years.

741 Crop Breeding Techniques1
Su, even years (0,3)
 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. Alternate years.

743 Physical Properties of Soils3
F, even years
 The exchange of energy and water at soil surfaces, infiltration and redistribution of water and soil physical properties related to plant growth. Emphasis on applications in development and utilization of soil and water resources in a manner consistent with preservation of environmental quality. P, consent. Alternate years.

744 Soil N, P, & K3
S, odd years
 Plant-soil nutrient relationships including nutrient sink development, uptake, transport to roots, labile soil sources, nutrient deficiencies, and their correction. Emphasis on nitrogen, phosphorus and potassium. P, consent. Alternate years.

745 Soil Secondary/Micronutrients2
S, even years
 Forms and reactions of secondary and micronutrients in soils, their plant functions and requirements, as well as deficiency correction. P, consent. Alternate years.

746 Plant Breeding3
 Plant Breeding applied to field crops and horticultural varieties with particular emphasis on the relationship of genetics and allied subjects. Cross-listed with HO 746. P, PS 103, Bio 371, or consent.

753 Genetics of Plant Disease Resistance3
S, even years
 Detailed examination of genetics and molecular biology of host-pathogen interactions and disease resistance; breeding plants for disease resistance; biotechnological applications to disease resistance; discussion of current topics in host-pathogen genetics. Alternate years.

754 Chemical Properties of Soils3
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. Alternate years.

756 Quantitative Genetics3
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, Bio371 and Stat641, or equivalent, or consent.

761 Taxonomy of Insects4
F, odd years (3,3)
 Collection, identification and classification of insects. Techniques of identifying the groups of economic insect pests that affect the production of feed, food and fiber. Alternate years.

763 Environmental and Physiological Aspects of Crop Production2
S, odd years
 Systems analysis of factors which limit or increase crop production and the potential for qualitative and quantitative adjustments. P, Bot 427 and consent of instructor. Alternate years.

773 Cytogenetics3
F, odd years (2,3)
 The nature and behavior of chromosomes in relation to heredity. P, Bio 371 or 343. Alternate years. Cross-listed with Bio 773.

780 Advanced Special/Research Problems1-2
 Advanced study and research in crops, plant pathology, and soils. P, consent.

781 Graduate Seminar1
F,S
 Reports and discussions of current investigations in crops, entomology, plant pathology, and soils. (2 credits required for M.S.; 3 credits for Ph.D.)

783 Crop-Water Relationships2
F, odd years
 An examination of the role of water on crop productivity with an emphasis on environmental and physiological factors affecting the absorption, movement and use of water in crops. Water associated stresses will be analyzed in terms of agronomic and physiological mechanisms of adaptation. P, Bot 427 and consent. Alternate years.

790 Thesis, MS1-7

791 Thesis Sustaining, MS0

797 Soil and Plant Analysis3
F, odd years (2,2)
 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. Alternate years.

890 Dissertation, PhD1-7

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.

891 Dissertation Sustaining, PhD0

BioS 890 Dissertation, PhD1-7

BioS 891 Dissertation Sustaining, PhD0

BioS 892 PhD Seminar1
F, S

Alex Kahler
 Professor
 Ph.D., University of California, 1973
 Molecular Biology

Robert W. Kieckhefer
 Professor
 Ph.D., University of Wisconsin-Madison, 1962
 Research Entomology

Gary Lemme
 Professor
 Ph.D., University of Nebraska, 1979
 Soils

Walter Riedell
 Associate Professor
 Ph.D., Southern Illinois University, 1984
 Plant Physiology

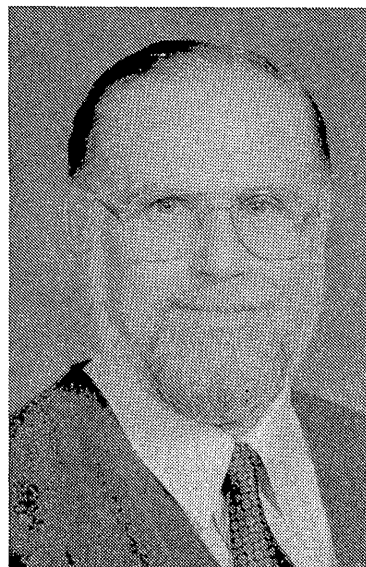
W. David Woodson
 Assistant Professor
 Ph.D., Oklahoma State University, 1990
 Research Entomology

Joint Appointment

Donald Evenson
 Professor of Station Biochemistry
 Ph.D., University of Colorado, 1968
 Cell Biochemistry

R. Neil Reese
 Associate Professor of Biology and Microbiology
 Ph.D., University of Idaho, 1984
 Plant Physiology

Peter Schaefer
 Professor of Horticulture, Forestry, Landscape,
 and Parks
 Ph.D., Michigan State University, 1983
 Forest Genetics



Paul Evenson, Graduate Coordinator
 Plant Science

Department of Political Science

Graduate Faculty

Robert V. Burns
Distinguished Professor
Ph.D., University of Missouri-Columbia,
1973
Public Law

Herbert E. Cheever, Jr.
Professor
Ph.D., University of Iowa, 1967
American Politics and Legislation

Gordon Tolle
Professor
Ph.D., University of Colorado-Boulder, 1978
Political Philosophy

Key to Course Descriptions

Course Number and NameCredits
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.

Mailing address: SDSU Box 504

Phone: 605/688-4909

Department Head: Distinguished Professor Robert V. Burns
Graduate Coordinator: Distinguished Professor Robert V. Burns

Major Degrees Offered

Master of Science: Not available

Doctor of Philosophy: Not available

Minors offered: Political Science

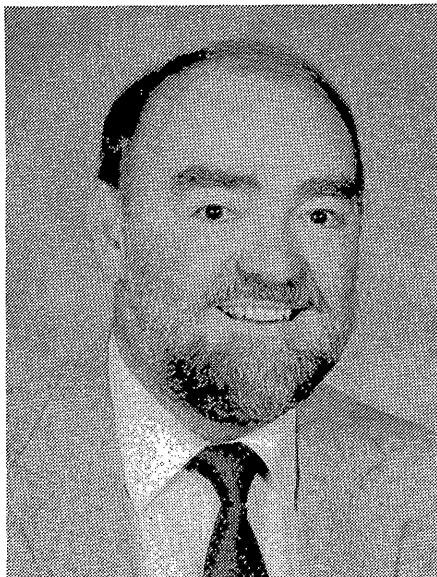
Political Science (PoIS) Course Offerings

560 Topics in Political Science1-4

An intensive examination of significant political themes, issues, or problems. Topics will include, but are not limited to, the following: Republics and Self-Government; the Constitution and Civil Liberties; Parties, Elections and Campaigns; Presidential-Congressional Relationships.

592 Special Problems1-3

Individual guided research culminating in formal research paper. May be repeated until 6 credits are earned.



*Robert V. Burns, Department Head
Political Science*

Department of Rural Sociology

Mailing address: SDSU Box 504

Phone: 605/688-4132

FAX: 605/688-6354

E Mail: satterlj@mg.sdstate.edu

Department Head: Professor James Satterlee
 Graduate Coordinator: Professor James Satterlee

Program Description

The Master of Science program is designed to prepare students to continue their academic careers in advanced doctoral programs, enter such applied fields as planning, demography, criminal justice, and research or enter into the teaching profession.

The Ph.D. program in Sociology is designed to prepare students for professional careers in teaching, research and creative activity in academic, government and related areas. Areas of emphasis for a major in the Ph.D. program include demography, family studies, human ecology, social deviance and social organization.

Major Degrees Offered

Master of Science: Rural Sociology

Doctor of Philosophy: Sociology

Available Options for Graduate Degrees

See Page 97 for Options in the Master of Science degree in Rural Sociology.

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

See pages 110 (M.S.) and 113 (Ph.D.) for descriptions of available options.

Core Requirements

Master of Science: Social Theory, 6 hrs.
 Research Methods, 6 hrs.

Doctor of Philosophy: Social Theory, 9 hrs.
 Research Methods, 9 hrs.
 Profession of Sociology, 3 hrs.
 Graduate Statistics, 3 hrs.

Additional Admission Requirements

GRE: Not required

TOEFL: Department requirement of 550

Both M.S. and Ph.D. candidates need a minimum of 24 credits of social science courses, of which 18 need to be in Sociology.

Master of Science: Courses in Research Methods, Social Theory, and Statistics must be completed as part of the previous work, or made up as deficiencies.

Doctor of Philosophy: Students seeking entrance must have an approved Bachelor's and Master's degree, not necessarily in Sociology.

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Anthropology (Anth) Course Offerings

590 Special Problems1-3
 Open to undergraduate and graduate students with sufficient background. P, consent.

597 Topics in Anthropology1-3

Selected topics pertaining to theory and methods in cultural, physical anthropology and archaeology. P, consent.

Criminal Justice (Cjus) Course Offerings

516 Problems in Criminal Justice3

An examination of selected contemporary problems in the administration of criminal justice.

Graduate Faculty

Donald Arwood
 Associate Professor
 Ph.D., South Dakota State University, 1989
 Research Methods, Demography

Donna Hess
 Professor
 Ph.D., Michigan State University, 1974
 Research Methods, Comparative Sociology

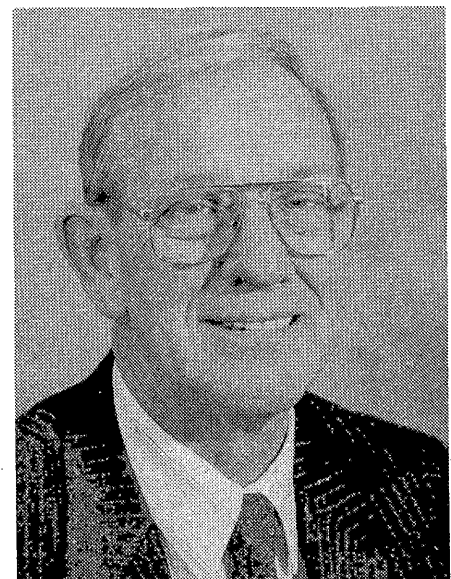
Diane Kayongo-Male
 Professor
 Ph.D., Michigan State University, 1974
 Social Theory, Demography

Robert Mendelsohn
 Professor
 Ph.D., Western Michigan University, 1973
 Social Theory, Social Deviance

James Satterlee
 Professor
 Ph.D., South Dakota State University, 1970
 Comparative Sociology, Demography

Ronald Stover
 Professor
 Ph.D., University of Georgia-Athens, 1975
 Anthropology, Industrial Sociology

Robert T. Wagner
 Professor
 Ph.D., South Dakota State University, 1972
 Demography, Social Organization



James Satterlee, Department Head
 Rural Sociology

Key to Course Descriptions

Course Number and NameCredits
 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.

Topic will change each semester. May be repeated for credit. Course descriptions available prior to term course is offered

Sociology (Soc) Course Offerings

502 Social Deviance3
 F
 This course will examine the nature of negatively evaluated behaviors and the processes by which customs, rules and normative structures of society are constructed. A primary goal of the development of a coherent interpretation of contemporary theories and empirical investigations of social deviance. P, consent.

533 Leadership and Group Organization.....3
 Emergence of leadership patterns. Emphasis on group dynamics, small groups, and leadership in management. P, consent of instructor.

551 Juvenile Delinquency3
 Causes of delinquency; patterns of delinquent behavior, juvenile and alternate solutions currently in operation throughout the U.S. which attempt to reduce the incidence of juvenile delinquency.

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. Alternate years.

560 Advanced Criminology3
 F
 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. Alternate years.

580 Sociology of Law3
 S
 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, Soc351. Alternate years.

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.

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.

630 Social Change3
 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.

640 Rural Community Planning3
 Changes occurring in rural areas and their effects upon rural communities. Basic concepts, procedures, and processes for planning in a rural environment. Some alternative approaches to rural planning. National and International perspectives. P, consent of instructor.

709 Evaluation Research3
 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. Alternate years.

710 Research Methods3_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 309, 310 or consent.

711 Qualitative Research Methods3_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 underpinnings and limitation of qualitative research. P, consent.

712 Sociological Theory I3_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.

713 Sociological Theory II3_S
 Sociological theories and issues from World War II to present. P, Soc 401 or consent.

714 Theory Construction3
 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. Alternate years.

716 Symbolic Interaction3
 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. Alternate years.

720 Profession of Sociology3_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.

762 Demographic Resources and Materials3
 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. Alternate years.

764 Modern Demographic Theory3
 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. Alternate years.

766 World Population Issues3
 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. Alternate years.

780 Special Problems1-3
 Advanced work or special problems in such areas as population, marriage and family, rural sociology, criminology, social organization or urban sociology. P, open to graduate students with sufficient background and consent.

781 Internship in Planning1-6
 P, Major and Planning option. P/F grade.

790 Thesis, MS1-5
791 Thesis Sustaining, MS0

792 Seminars in Sociology(on demand) 1-4
 1. Sociology of Religion
 2. Advanced Social Psychology
 3. Advanced Criminology
 4. Domestic Violence
 5. Victimology
 6. Extra-Ordinary Groups

890 Dissertation, PhD1-variable
891 Dissertation Sustaining, PhD0

Master of Science Program*

Option A, Thesis

Traditional masters degree program designed to prepare students to enter post-secondary teaching and/or continuation toward the doctorate.

Option B, Research/Design Paper

Designed to prepare students to enter such applied fields of research, criminal justice, demography, family studies, or planning and development.

Option C, Non-Thesis

Designed for elementary- and secondary-level teachers and social service personnel not in need of the research emphasis offered in Options A and B.

Doctor of Philosophy Program*

Areas of concentration:

- Demography*
- Social Deviance*
- Social Organization*
- Family Studies*
- Human Ecology*

*See department Graduate Guide for detailed information and course scheduling.

Department of Veterinary Science

Graduate Faculty

David Benfield
 Professor
 Ph.D., University of Missouri-Columbia,
 1979
 Molecular Virology

Christopher Chase
 Associate Professor
 D.V.M., Iowa State University, 1980
 Virology/Immunology

Alan Erickson
 Assistant Professor
 Ph.D., North Dakota State University, 1989
 Biochemistry

David Francis
 Professor
 Ph.D., University of Missouri-Columbia,
 1978
 Bacteriology

Eric Nelson
 Assistant Professor
 Ph.D., South Dakota State University, 1993
 Molecular Virology

John Thomson
 Professor
 D.V.M., Iowa State University of Science and
 Technology, 1967
 Epidemiology

David Zeman
 Professor
 D.V.M., Oklahoma State, 1980
 Pathology



John U. Thomson, Department Head
 Veterinary Science

Mailing address: SDSU Box 2175

Phone: 605/688-5172

Department Head: Professor John U. Thomson
 Graduate Coordinator: Professor David Francis

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.

Major Degrees Offered

Master of Science: Not available

Doctor of Philosophy: Biological Sciences, with an area of study in Veterinary Science

Available Options for Graduate Degrees

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

See page 113 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 106. Graduate students should consult with their advisor before registering for graduate work.

Veterinary Science (Vet) Course Offerings

524 Medical and Veterinary Virology	4
Basic course discussing the characterization, structure, and replication of viruses and the pathogenesis of viral disease in man and animals. Laboratory exercises emphasize techniques in virus isolation, characterization, and detection by immunological assays. P, Micr 422 or consent. Cross-listed with Micr 524.	
590 Problems in Veterinary Science	1-3
P, consent of Department Head. <i>on demand</i>	
723 Systemic Physiology	4
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. Alternate years. <i>S, even years (3,3)</i>	
792 Special Problems	1-4
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.	
793 Special Topics	1-4
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.	
BioS 890 Dissertation, PhD	1-7
BioS 891 Dissertation Sustaining, PhD	0
BioS 892 PhD Seminar	1

Department of Wildlife and Fisheries Sciences

Mailing address: SDSU Box 2140B

Phone: 605/688-6121

Fax: 605/688-4515

E Mail: longielj@mg.sdstate.edu

Home Page Address: <http://www.sdstate.edu/~wwfs/http/wfsci.htm>

Department Head: Professor Charles Scalet
Graduate Coordinator: Professor Charles Scalet

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 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.

Major Degrees Offered

- Master of Science: Wildlife and Fisheries Sciences
Wildlife Option
Fisheries Option
- Doctor of Philosophy: Biological Sciences, with an area of study in Wildlife and Fisheries Sciences

Available Options for Graduate Degrees

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

See pages 110 (M.S.) and 113 (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: Strongly Recommended
TOEFL: Department Requirement of 525

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.

Wildlife and Fisheries Sciences (WL) Course Offerings

515 Upland Game Ecology and Management*3

F, even years (2,3)

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 or consent of instructor.

Graduate Faculty

Charles R. Berry
Professor
Ph.D., Virginia Polytechnic Institute and State University, 1976
Fish Physiology

Michael L. Brown
Assistant Professor
Ph.D., Texas A & M University, 1993
Fish Culture, Fisheries Management

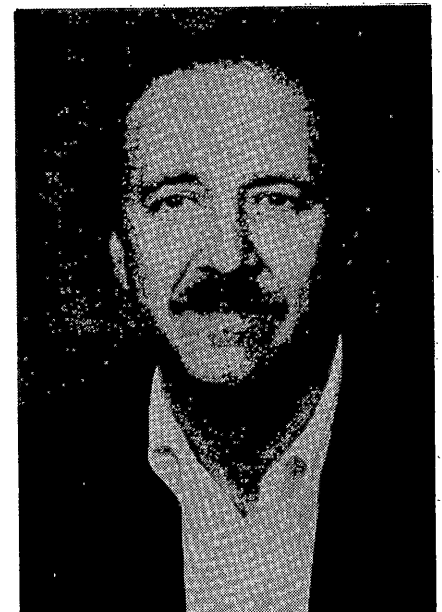
Walter G. Duffy
Associate Professor
Ph.D., Michigan State University, 1985
Limnology

Lester D. Flake
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
Associate Professor
Ph.D., South Dakota State University, 1988
Wetland Ecology

Jonathan A. Jenks
Associate Professor
Ph.D., Oklahoma State University, 1991
Population Dynamics



Charles Scalet, Department Head
Wildlife and Fisheries Sciences

Charles G. Scalet
 Professor
 Ph.D., University of Oklahoma, 1971
 Fisheries Biology

David W. Willis
 Professor
 Ph.D., Colorado State University, 1980
 Fisheries Management

Key to Course Descriptions

Course Number and NameCredits
 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.

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 trouts, 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.

517 Large Mammal Ecology and Management*3
S, even years (2,3)
 Large mammal life histories and distributions. Relationships of nutrition, reproduction, interspecific competition, and predation to management of large mammal habitat and harvest. Techniques for research and management of large mammals. P, WL 411 or consent of instructor.

519 Waterfowl Ecology and Management*3
F, odd years (2,3)
 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 or consent of instructor.

521 Grassland Fire Ecology*3
F, even years (2,3)
 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.

523 Fish Culture*3
F, odd years (2,3)
 Extent and potential for fish culture. Emphasis placed on culture methods of important commercial and sport fishes of North America. P, consent of instructor.

593 Special Topics in Wildlife and Fisheries*1-3
as arranged
 Students may secure small-group instruction in a variety of special topics including ecosystem analysis of grasslands, woodlands, small ponds, or reservoirs. Other special topics offered on occasion are animal damage control, endangered species, public relations for resource managers, and other topics. Contact department head concerning planned special topics. P, consent of instructor.

613 Advanced Fisheries Management*3
F, even years (2,3)
 Principles and techniques of selected practices for reservoir, pond, and stream fisheries management. P, WL 367, WL 412, or consent of instructor.

711 Aquatic Ecology*2
F, odd years (1,3)
 Qualitative and quantitative measurements of aquatic populations including primary production of biomass. Interrelationship of biotic and abiotic components of aquatic ecosystems. Productivity and factors affecting rates of transfer of energy and matter within aquatic communities will be stressed. P, consent of instructor.

712 Wetland Ecology and Management*3
F, odd years (2,3)
 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.

713 Animal Population Dynamics*3
F, even years (2,3)
 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.

714 Fish Structure and Function*3
S, odd years (2,3)
 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.

715 Wildlife Research Design*3
S, odd years (2,3)
 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.

717 Advanced Limnology*3
S, even years (2,2)
 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.

718 Ecology of Aquatic Invertebrates3
F, even years (2,3)
 Involves the identification of and ecological relationships associated with aquatic invertebrates. Aquatic habitats of the north central states are stressed. P, consent of instructor.

790 Thesis, MS1-7

791 Thesis Sustaining, MS0

792 Graduate Seminar1
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.

793 Research Problems1-3
 Individualized instruction on specific research problems. P, consent of instructor.

BioS 890 Dissertation, PhD1-7

BioS 891 Dissertation Sustaining, PhD0

BioS 892 PhD Seminar1
F, S

*Field trips required in these courses may result in pro-rata charges to defray transportation costs.

*Philosophy Statements for Degree Programs
 in the Department*

M.S. 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.

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.

Miscellaneous Graduate Courses

Graduate Faculty

Norman R. Gambill
Professor of Visual Arts
Ph.D., Syracuse University, 1976
American Studies, Art History, Film History,
Popular Culture

Karen H. Cardenas
Professor of Foreign Languages
Ph.D., University of Kansas, 1973
Spanish Language and Literature, Foreign
Language Pedagogy

Anthony H. Richter
Professor of Foreign Languages
Ph.D., Northwestern University, 1971
German Literature, Russian-German
Immigrants

Anne Fennell
Assistant Professor of Horticulture, Forestry,
Landscape and Parks
Ph.D., University of Minnesota-Minneapolis/
St Paul, 1985
Molecular Biology, Stress Physiology, Fruit
Crop Research

W. Carter Johnson
Professor of Horticulture, Forestry, Landscape
and Parks
Ph.D., North Dakota State University 1971
General Ecology with specialization in Forest
and Wetlands

Peter R. Schaefer
Professor of Horticulture, Forestry, Landscape
and Parks
Ph.D., Michigan State University, 1983
Forest Genetics

Russell L. Stubbles
Associate Professor of Horticulture, Forestry,
Landscape and Parks
Ph.D., Texas A & M University, 1979
Forest Recreating Planning

AnnMarie B. Bahr
Associate Professor of Philosophy and Religion
Ph.D., Temple University, 1989
World Religions

Dennis D. Bielfeldt
Assistant Professor of Philosophy and Religion
Ph.D., University of Iowa, 1987
Luther and Christian Theology

Allen R. Branum
Professor of Psychology
Ph.D., University of Montana, 1971
General, Experimental Psychology

Kenneth Hillner
Professor of Psychology
Ph.D., Indiana University, 1965
General, Experimental Psychology

The courses listed are available for graduate credit. No graduate majors or minors are offered in the following programs.

Art Education (ArE) Course Offerings

592 Special Problems in Visual Arts 1-3

Engineering Mechanics (EM) Course Offerings

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, EM 331, Math 331.

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.

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 applications to extrusion problems; limit-analysis theorems and their applications to structural problems. P, EM 522 or consent.

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 331, or consent.

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.

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. Alternate years.

Foreign Languages (FL) Course Offerings

560-660 Topics in French, German or Spanish Literature 1-4

An intensive examination of a significant writer(s), period or theme in French, German, or Spanish literature. It may be repeated for credit if topic is different.

593 Special Topics in Language and Culture 1-3

Readings and discussions of selected topics dealing with a variety of aspects of culture. Training and practice in the use of the spoken language. May be repeated for credit.

Horticulture (HO) Course Offerings

580 Environmental Stress Physiology 3

Physiological and cellular response of perennial plants to environmental stresses. P, Bot 327.

S, even years

590 Special Topics in Horticulture1-3

Students may receive small-group instruction in selected horticultural topics. P, consent.

746 Plant Breeding3
s

Plant Breeding applied to field crops and horticultural varieties with particular emphasis on the relationship of genetics and allied subjects. Cross-listed with PS 746. P, PS 103, Bio 371, or consent.

Philosophy (Phil) Course Offerings

592 Special Problems in Philosophy1-3

Individual guided research culminating in formal research paper or series of essays. May be repeated until 6 credits are earned.

Psychology (Psyc) Course Offerings

560 Topics in Psychology: (Topical)1-4

An intensive examination of significant psychological issues, themes, or problems. May be repeated as topic changes for a total of 8 credits. P, Psyc 101 or Psyc 102.

592 Special Problems in Psychology1-4

Selected studies for advanced students. P, Psyc 101 or Psyc 102.

Key to Course Descriptions

Course Number and 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.

Atmospheric, Environmental and Water Resources

Mailing address: SDSU Box 2219

Phone: 605/688-6252

Fax: 605/688-5878

Coordinator: Professor Vernon R. Schaefer

Program Description

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

Major Degrees Offered

Doctor of Philosophy: Atmospheric, Environmental and Water Resources

Core Requirements

A common program core will be required of all students, which includes four courses and seminars taken by all students in the joint program. These courses were chosen to give every student in the program some knowledge in all three disciplines and to assure some capability in modeling fluid systems, a basis for much doctoral work in these areas.

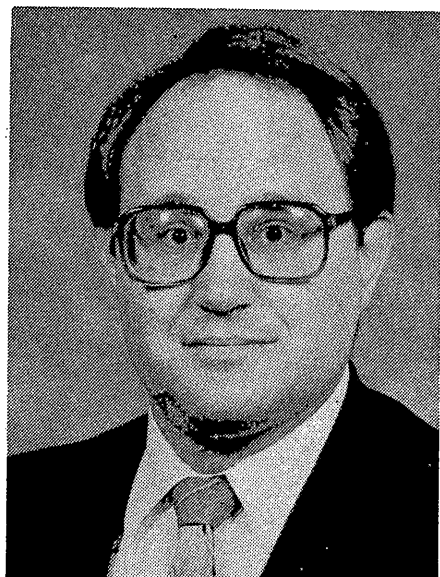
The primary core courses consist of:

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

In addition, three secondary core courses in the specialty field will be required, selected from an approved list. 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 30 dissertation credits.

The Rural Development Telecommunications Network (RDTN) will be used to provide instruction from one university to the other. Of the four common core courses, the three specialty degree core courses, and the elective courses, five must be taken from the complementary university's faculty if the student starts from the bachelor's degree level, three if he or she starts with a qualifying Master of Science degree.

General Requirements begin on page 106. Graduate students should consult with their advisor before registering for graduate work.



Vernon R. Schaefer, Coordinator
Atmospheric, Environmental and Water
Resources

Atmospheric, Environmental and Water Resources (AEWR) Course Offerings

890 Dissertation, PhD	.....1-12
891 Dissertation Sustaining, PhD	.....0
892 Seminar, PhD	.....1

Mailing address: SDSU Box 2175

Phone: 605/688-5431

Coordinator: Associate Professor Doug McFarland

Program Description

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

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

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

Major Degrees Offered

Doctor of Philosophy: Biological Sciences

<u>Current Areas of Study</u>	<u>Department</u>
<i>Muscle Biology</i>	<i>Animal and Range Sciences</i>
<i>Range Science</i>	<i>Animal and Range Sciences</i>
<i>Biology</i>	<i>Biology and Microbiology</i>
<i>Microbiology</i>	<i>Biology and Microbiology</i>
<i>Dairy Manufacturing</i>	<i>Dairy Science</i>
<i>Plant Molecular Biology</i>	<i>Plant Science</i>
<i>Veterinary Microbiology</i>	<i>Veterinary Science</i>
<i>Veterinary Pathobiology</i>	<i>Veterinary Science</i>
<i>Fisheries Science</i>	<i>Wildlife and Fisheries Sciences</i>
<i>Wildlife Science</i>	<i>Wildlife and Fisheries Sciences</i>

Core Requirements

The Biological Sciences program has only two specific course requirements:

- Stat 541 Statistical Methods II3
 - BioS 892 Seminar1
- (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 106. Graduate students should consult with their advisor before registering for graduate work.

Biological Sciences (BioS) Course Offerings

- 890 Dissertation, PhD1-7
- 891 Dissertation Sustaining, PhD0
- 892 Seminar, PhD1



*Doug McFarland, Coordinator
Biological Sciences*

Academic Information

Course Numbering System

300-499 series – Advanced undergraduate courses which may be used in meeting part of the requirements for graduate degrees in accordance with the policy on converted credit, page 106.

These courses are not listed in this bulletin, but are listed in the general catalog.

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, through a permit).

600-699 series – Graduate level courses open only to graduate students.

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, in the Bachelor's degree.

700-799 series – Graduate level (graduate students only).

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 97, 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.

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. Converted credits are usually not permitted in The Master of Science Teaching degree.
- 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. Transfer credits may not be converted.
- f. 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.

NOTE: When credits in the 300-400 series are applied to a graduate program, they are entered on the graduate transcript without notation. It is doubtful, therefore, that they could be transferred as graduate credit to another institution.

Course Restrictions for Masters and Doctoral Plans of Study

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

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

Transfer of Credits -- Graduate credits earned while in residence at other institutions may be applied toward an advanced degree if they were awarded a grade of at least "B" (3.0), and if they are approved by the Advisor or Advisory Committee and the Dean of the Graduate School. Transfer credit is limited to Graduate credit as defined by the institution issuing the transcript. Dual-numbered courses offered primarily for upper-level undergraduate credit are (generally) not transferrable as graduate credit. Transfer credits cannot substitute for credits required for minimum residence (see Residence and Credit Requirements). Requests for transfer of credits are usually made at the time a Plan of Study is approved and must be supported by an official transcript filed with the Graduate School. For the Master's degree, transfer credits are limited to 10 credits with 7 credits in the major and 3 credits in the minor or supporting area, if applicable.

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 of an accredited institution and were taught by members of the Graduate Faculty of such institution. Subtitles or explanatory information will be required for approval of Independent Study and Readings' Courses. Transfer credit is usually not permitted for work from foreign institutions.

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

Credit Loads

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

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

Maximum credits **graduate assistants** may carry:

	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.

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

Grades

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

Thesis, Research/Design Paper, Dissertation Credits -- Graduate students usually register for thesis/dissertation/research paper credit during several semesters. An "in progress" (IP) is given until satisfactory completion of the thesis/paper/dissertation and final oral examination. The advisor, upon satisfactory completion of these credits and final oral, will then assign a satisfactory grade (P) for all thesis/paper/dissertation and sustaining credits by notifying the Registrar through the "Change of Grade" form. If not satisfactory, a grade

of unsatisfactory (F) is given. Departments may elect to use Pass/Fail for Thesis and Dissertation providing the Graduate School and Registrar are notified and the policy is applied uniformly to all students in the program.

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

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

Graduate Credit for Seniors

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

Graduate Study by University Staff

Staff members with the rank of Assistant Professor or above may not work toward an advanced degree at this institution, but all staff members may take graduate courses for credit with permission from the Department Head, Dean and/or other required authorization. A Graduate application should be completed. An "Authorization For Educational Benefits" form, obtained from the Personnel Office, should be completed and returned to the Personnel Office before registration.

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

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

Postdoctoral Study

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

Graduation

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

Commencement Attendance -- All students are urged to participate in the Commencement exercises at which their degree is to be granted. However, attendance is optional.

Students must notify the Registrar of their intent to attend or not attend on a card mailed to them shortly before Commencement. Diplomas will be mailed approximately three months after Commencement. It should be noted that attendance at Commencement or inclusion in the Commencement Bulletin does not in itself complete the degree requirements since all work on the Plan of Study must be successfully completed for award of the degree.

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

Continuing Registration, Sustaining Enrollment for Thesis/Dissertation/Research

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

Registration is the students' 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.

Graduate Academic Standards and Appeals

Graduate students are expected to maintain at least a "B" average (3.0) in all courses in the graduate program. 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 the situation cannot be resolved. 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.

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

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.

Masters Degree Requirements

Master's Degrees and Options

Major	Degree	Options
Agricultural Engineering	M.S.**	A B
Agronomy	M.S.	A B
Animal Science@	M.S.	A
Biology	M.S.	A B
	M.S.T.*	C
Chemistry	M.S.	A
	M.S.T.*	C
Communication Studies and Journalism	M.S.	A
Counseling and Human Resource Development	M.S.	A B C
Curriculum & Instruction	M.Ed.	B C
Dairy Science	M.S.	A
Economics	M.S.	A B
J.D./M.S.		A B
Educational Administration	M.Ed.	B C
Engineering#	M.S.	A B C
English	M.A.	A C
Entomology	M.S.	A
Family and Consumer Sciences^	M.S.	A B C
Geography	M.S.	A B
Health, Physical Education and Recreation	M.S.	A B C
Industrial Management	M.S.	A B C
Mathematics	M.S.	A B C
	M.S.T.*	C
Microbiology	M.S.	A
Nursing	M.S.	A B
Pharmaceutical Sciences	M.S.***	A
Plant Pathology	M.S.	A
Physics	M.S.T.*	C
Rural Sociology	M.S.	A B C
Wildlife and Fisheries Science		
Fisheries Option	M.S.	A
Wildlife Option	M.S.	A

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

Agricultural Engineering
Civil Engineering
Computer Science
Electrical Engineering
Mechanical Engineering@
Physics

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

Apparel Merchandising and Interior Design
Human Development, Consumer and Family
Sciences
Nutrition and Food Science

@Department requires a minor/supporting area.

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.

* As of July 1, 1996 the M.S.T. program has been discontinued and no new students will be admitted.

** As of July 1, 1996 the M.S. in Agricultural Engineering has been merged into the M.S. in Engineering with an emphasis in Agricultural Engineering.

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

Admission Requirements

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

Advisory (Orals) Committee

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

- major advisor -- acts as chairperson of the committee, must have Graduate Faculty status;
- major department representative -- an additional member of the major department;
- 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.
- Graduate Faculty Representative -- The Graduate Dean will select this member from a department not closely related to the major/minor/supporting areas. This member ensures the rules and regulations are followed and acts as the student's advocate, if necessary.
- 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 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 your plan of study, refer to the "Academic Information" section in this Bulletin, beginning on page 106, in addition to the following information.

- Options:
- AThesis
 - BResearch Paper/Design Paper
 - CCoursework

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

The minimum residence requirement is 22 semester hours, including at least one semester or two summer sessions of graduate work spent on the Brookings campus or at an approved resident center. A resident center is an academic center recognized by South Dakota State University with an on-site director, at least one staff member who is a member of the graduate faculty, and library support through the PALS network, agreements with other institutions or equivalent accessible library resources.

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

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

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

Admission to Candidacy

Admission to the Graduate School does not imply admission to candidacy. A student is admitted as a candidate only after 20 graduate credits have been earned (transfer credits may apply), provided:

- The grade point average is "B" or better in the major and "B" or better in the minor or supporting courses, and
- Reasonable progress has been made in the research for the thesis, research report or design paper as applicable, and
- An approved program of study is on file at the Graduate School, and
- The major advisor recommends admission.

A student must be admitted to candidacy before taking his/her oral examination.

Examinations

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

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

Research Paper/Design Paper

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

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

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

*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.

NOTES:

- See separate listing for Master of Science Teaching requirements.
- Some degree programs require additional credits, see program listings.

Master's Degree Checklist

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

Grading -- (See page 107 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. A written research plan must be approved by the Advisory Committee not later than the end of the second semester of graduate work. The thesis accounts for 5 to 7 semester hours in the major.

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

Grading -- See page 107 for grading policies for Thesis.

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

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

Multiple Masters Degrees or Majors

Graduate students may pursue a second or additional masters degree in majors other than their first masters 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. Multiple majors within a degree program are not permitted.

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 and can be accomplished by passing a written validation examination in the subject matter area. Validation of obsolete coursework cannot exceed six graduate credits and must be certified by the Advisory Committee on a form prescribed by the Graduate School.

Continuing Registration, Sustaining Enrollment for Thesis/Design Paper and Research Paper -- See page 109.

Doctor of Philosophy Degree Requirements

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 part-time) the major advisor will recommend to the Dean of the Graduate School members of an Advisory Committee as follows:

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

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

The Advisory Committee is responsible for assisting the student in developing a suitable graduate program, providing continuing 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, determines the student's proficiency with the research tools, conducts the comprehensive examinations and the final examination, supervises the validation of courses, and ensures that professional standards have been met in completing the degree requirements.

Plan of Study Information

Within six weeks after the Advisory Committee is formed, they will schedule a meeting with the student to approve a Plan of Study and to consider a research area for the dissertation. The Plan of Study must be prepared on the appropriate form 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 on a form furnished by the 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 106, in addition to the following information.

Doctor of Philosophy Degrees

Majors

Agricultural Engineering

Offered through a cooperative program with Iowa State University.

Agronomy

Animal Science

*Offered in the Departments of:
Animal and Range Sciences
Dairy Science*

Atmospheric, Environmental and Water Resources

Offered in cooperation with the South Dakota School of Mines and Technology (SDSM&T).

Biological Sciences

*Offered in the Departments of:
Animal and Range Sciences
Biology and Microbiology
Dairy Science
Plant Science
Veterinary Science
Wildlife and Fisheries Science
Offered in cooperation with the University of South Dakota (USD).*

Chemistry

Sociology

Doctor of Philosophy Degree Checklist

<u>Requirements</u>	<u>When Due</u>
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

Plan of Study Credit Requirements

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

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

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

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

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

Dissertation

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

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

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

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

Binding -- After the final oral examination, all necessary corrections in the dissertation are made and four copies are submitted to the Library to pay for the binding. The cost for binding these copies is the responsibility of the student. Two copies, one on at least 50 percent rag content paper (cotton bond), and an additional abstract, printed on at least 50 percent rag content paper (cotton bond), must be returned to the Graduate School with a receipt from the Library showing the binding costs paid for the four copies. This should be completed at least five *working* days prior to commencement. The student must agree to the publication of the abstract and payment for publication of the abstract and microfilming of the dissertation.

Dissertation Sustaining

See page 109, section titled "Continuing Registration, Sustaining Enrollment for Thesis/Dissertation/Research".

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. Since the Doctor of Philosophy is a terminal academic degree, evaluation of student performance includes an evaluation of progress in the program as well as 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 the coursework are taken. These examinations are open for all members of the Graduate Faculty to listen but not participate in the questioning. The first is a comprehensive written examination which 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 is taken. 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 of the examination 10 *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 powers are usually asked. The final oral examination cannot be taken earlier than two months following successful completion of the comprehensive examinations and must be completed ten *working* days prior to commencement.

Residence Requirements

The minimum residence requirement is 50 credits, including two semesters spent on

campus. Those on full-time faculty/staff appointment and graduate assistants may satisfy the residence requirements within one academic year.

Time Limitation

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

Obsolete Coursework -- Courses completed more than eight years before completion of the doctorate and not part of a previous degree are regarded as obsolete coursework. Such courses may be used in the doctoral degree program if validated. Validation is allowed at the discretion of the Advisory Committee and department involved and can be accomplished by passing a written validation examination in the subject matter area. Validation of obsolete coursework cannot exceed six graduate credits and must be certified by the Advisory Committee on a form prescribed by the Graduate School. However, credits earned as a part of a Master's degree which is applied toward the doctoral program remain valid and require no validation.

Financial Information and Student Services

Tuition and Fees*

<u>Tuition, per credit hour</u>	<u>Cost</u>
Undergraduate Resident	\$ 53.00
Undergraduate Non-Resident	168.00
Graduate Assistant, undergraduate course	26.58
Graduate Resident	79.75
Graduate Non-Resident	235.25
Graduate Assistant, graduate course	26.58

<u>Fees, per credit hour</u>	<u>Cost</u>
University Support Fee	\$ 24.43
University Student Fee (Activity Fee)	11.11
Guarantee Deposit, refundable	60.00
Engineering Education Fee, per credit	12.15
Engineering/Science Lab fees, per course	19.00
Nursing Major Fee, per semester	127.00
Nursing University Support Fee, per credit	25.43

*Effective Fall 1996 and subject to change by action of the Board of Regents.

Fees for Auditing Courses

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

Thesis and Dissertation Fees

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

Doctor of Philosophy students must pay a fee to the Library to cover the cost of binding four copies of the dissertation. A Money Order or Cashier's Check payable to U.M.I. 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

Application Fee -- *non-refundable charge assessed all applicants for initial admission unless previously attended a South Dakota public university.*

University Student Fee -- *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 -- *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.*

Student Health Fee -- *to cover the cost of providing outpatient clinical services.*

Guarantee Deposit -- *required of all students enrolled in 9 or more credits or living in a residence hall. Defrays charges for damage of laboratory equipment, supplies or housing facilities. Library and vehicle fines or special service fees may be assessed against this deposit. Refundable 75 days following termination of enrollment.*

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

Engineering/Science Lab Fee -- *per designated course; funds used for supplies and materials and to purchase equipment.*

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 Administration Building Room 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 University 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 Disabled Student Advisor is available in Administration Building Room 318, telephone 605/688-4496.

Health Service -- The Health Service provides outpatient services and is located on the second floor of West Hall. Information is available by calling 605/688-4157 or 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 101, telephone 605/688-5916.

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

Living Costs -- Living costs, including tuition and fees, for the single resident graduate student are estimated to be approximately \$8,000 per academic year. Travel costs are not included.

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

Graduate Faculty

- ADAMSON, Dwight W., Associate Professor of Economics, 1989; B.A., Washington State University, 1976; M.A., 1983; Ph.D., 1988.
- ANDERSON, Gary A., Associate Professor of Agricultural Engineering, 1987; B.S., SDSU, 1975; M.S., Iowa State University of Science & Technology, 1985, Ph.D., 1987.
- ANDRAWIS, Alfred S., Associate Professor of Electrical Engineering, 1981; B.S., Alexandria University, 1974; M.S., SDSU, 1982; Ph.D., Virginia Polytechnic Institute and State University, 1991.
- ANDRAWIS, Madeleine Y., Associate Professor of Electrical Engineering, 1980; B.S., Cairo University, 1977; M.S., SDSU, 1983; Ph.D., Virginia Polytechnic Institute and State University, 1991.
- ARNOLD, W. Eugene, Associate Dean of the College of Agriculture and Biological Sciences, Professor of Plant Science, 1970; B.S., Oklahoma State University, 1965; Ph.D., North Dakota State University, 1970.
- ARWOOD, Donald E., Associate Professor of Rural Sociology, 1986; B.S., SDSU, 1980; M.S., 1982; Ph.D., 1989.
- BAER, Robert J., Professor of Dairy Science, 1982; B.S., University of Georgia, 1977, M.S., 1979, Ph.D., 1983.
- BAHR, AnnMarie B., Associate Professor of Philosophy & Religion, 1988; B.A., Lawrence University, 1972; M.A., Stanford University, 1975; Ph.D., Temple University, 1989.
- BASSETT, Kurt, Assistant Professor of Mechanical Engineering, 1982; B.S., SDSU, 1981; M.S., 1983; Ph.D., North Dakota State University, 1995.
- BELL, Rodney, Professor and Head of History, 1970; B.S., Jamestown College, 1955; M.A., University of Michigan-Ann Arbor, 1956, Ph.D., 1975.
- BENFIELD, David A., Professor of Veterinary Science, 1979; B.S., Purdue University, 1973, M.S., 1976; Ph.D. University of Missouri-Columbia, 1979.
- BENNETT, Larry, Professor of Mathematics and Statistics, 1970; B.S., University of Oklahoma, 1965, M.A., 1967, Ph.D., 1970.
- BERG, Donald J., Associate Professor of Geography, 1990; B.A., North Dakota State University, 1964; M.A., 1966; M.A., University of California-Berkeley, 1971; Ph.D., 1976.
- BERGUM, Gerald E., Professor and Head of Computer Science, 1970; B.S., University of Minnesota-Minneapolis/St. Paul, 1958; M.S., University of Notre Dame, 1962; Ph.D., Washington State University, 1969.
- BERRY, Charles, Adjunct Professor of Wildlife & Fisheries, (USDI), 1985; B.A., Randolph Macon College; M.S., Forham University; Ph.D., Virginia Polytech & State University, 1976.
- BIELFELDT, Dennis D., Assistant Professor of Philosophy and Religion, 1995; B.S., SDSU, 1977; M.A., University of Iowa, 1984; Ph.D., 1987.
- BILLOW, Joye A., Professor of Pharmaceutical Sciences, 1972; B.S., Temple University, 1966, Ph.D., 1972.
- BIRKELO, Carl P., Associate Professor of Animal and Range Sciences, 1988; B.S., California State University-Chico, 1976; M.S., Colorado State University, 1984, Ph.D., 1988.
- BLEAKLEY, Bruce H., Assistant Professor of Biology and Microbiology, 1991; B.S., Michigan State University, 1978, M.S., 1981; Ph.D., University of Florida, 1986.
- BOE, Arvid A., Professor of Plant Science, 1976, 1979; B.A., Pacific Lutheran University, 1972; M.A., University of South Dakota, 1976; Ph.D., SDSU, 1979.
- BOOHER, James M., Professor of Health, Physical Education and Recreation, Athletic Trainer, 1967; B.A., Nebraska Wesleyan University, 1965; R.P.T., School of Physical Therapy, Mayo Clinic, 1967; M.S., SDSU, 1969; Ph.D., University of Utah, 1976.
- BRANDT, Bruce E., Professor of English, 1979; B.A., University of Denver, 1969, M.A., 1971; Ph.D., Harvard University, 1977.
- BRANUM, Allen R., Assistant Dean of the College of Arts and Science, Professor of Psychology, 1970; B.S., Montana State University, 1966; M.A., University of Montana, 1968, Ph.D., 1971.
- BROWN, Lewis F., Associate Professor and Head of Electrical Engineering, 1992; B.S., SDSU, 1984; M.S., Iowa State University, 1986, Ph.D., 1988.
- BROWN, Michael, Assistant Professor of Wildlife and Fisheries Sciences, 1994; B.S., Arkansas Technical University, 1986; M.S., Texas A & M University, 1989; Ph.D., 1993.
- BRYANT, David A., Dean of the College of Agriculture and Biological Sciences, Professor of Animal and Range Sciences, 1987; A.A., Lower Columbia College, 1963; M.S., Texas Technical University, 1967; Ph.D., University of Arizona, 1971.
- BURNS, Robert V., Distinguished Professor and Head of Political Science, 1970; B.S., SDSU, 1964; M.A., University of Missouri-Columbia, 1966, Ph.D., 1973.
- CARDENAS, Karen H., Professor and Head of Foreign Languages, 1992; B.A., Grinnell College, 1965; M.A., University of Kansas, 1970, Ph.D., 1973.
- CARLSON, C. Gregg, Professor of Plant Science/Extension Specialist, 1974; B.S., Western Illinois University, 1969; M.S., SDSU, 1972, Ph.D., 1978.
- CARTER, Catherine D., Associate Professor of Plant Science, 1989; B.S., George Peabody College, 1975, B.M.E., 1971, M.S., 1976; Ph.D., University of Kentucky, 1982.
- CHANDLER, Laurence D., Adjunct Professor of Plant Science, 1994; B.S., Stephen F. Austin State University, 1973; M.S., 1975; M.S., Texas Technical University, 1978; Ph.D., Texas A & M University, 1986.
- CHAPPELL, Gary S., Professor and Head of Pharmaceutical Sciences, 1973; B.S., The Ohio State University, 1963; Ph.D., University of Kansas, 1968.
- CHASE, Christopher, Associate Professor of Veterinary Science, 1992; M.S., University of Wisconsin-Madison, 1987, Ph.D., 1990, D.V.M., Iowa State University of Science and Technology, 1980.
- CHASE, Thomas E., Associate Professor of Plant Science, 1990; B.S., SUNY C Environmental Sci-Fors, 1979; Ph.D., University of Vermont, 1986.
- CHEESBROUGH, Thomas M., Associate Professor of Biology and Microbiology, 1990; B.S., University of Wyoming, 1976, M.S., 1978; Ph.D., Purdue University, 1982.
- CHEEVER, Jr., Herbert E., Dean of the College of Arts & Science, Professor of Political Science, 1968; B.S., SDSU, 1960; M.A., University of Iowa, 1962, Ph.D., 1967.
- CHIPMAN, Helen, Assistant Professor of Nutrition and Food Science, 1992; B.S., Utah State University, 1980; M.S., Colorado State University, 1988, Ph.D., 1992.
- CHOLICK, Fred A., Director of Agriculture Experiment Station and Professor of Plant Science, 1981; B.S., Oregon State University, 1972; M.S., Colorado State University, 1975, Ph.D., 1977.
- CHU, Shu Tung, Professor of Agricultural Engineering, 1967; B.S., National Taiwan University, 1956; M.S., University of Minnesota-Minneapolis/St Paul, 1960, Ph.D., 1966.
- CLAY, David E., Associate Professor of Plant Science, 1990; B.S., University of Wisconsin, 1976; M.S., University of Idaho, 1984; Ph.D., University of Minnesota-Minneapolis/St Paul, 1988.
- CLAY, Sharon A., Associate Professor of Plant Science, 1989; B.S., University of Wisconsin, 1977; M.S., University of Idaho, 1982; Ph.D., University of Minnesota-Minneapolis/St Paul, 1986.
- CONG, Bin, Associate Professor of Computer Science, 1991; B.S., Nanjing University, 1982; Ph.D., University of Texas, 1991.
- COSTELLO, W.J., Distinguished Professor of Animal & Range Sciences, 1965; B.S., North Dakota State University, 1954; M.S., Oklahoma State University, 1960, Ph.D., 1963.

- CRAIN, David, Professor of History, 1973; B.A., Pittsburgh State University, 1960; M.A., George Washington University, 1962; Ph.D., Indiana University-Bloomington, 1972.
- CREWS, Michael G., Professor of Nutrition and Food Science, 1984; B.S., Virginia Polytechnic Institute and State University, 1972, Ph.D., 1978.
- CUMBER, Carol J., Assistant Professor of Economics, 1990; B.A., North Dakota State University, 1979; M.B.A., 1984; Ph.D., SDSU, 1994.
- DANKER, Kathleen A., Associate Professor of English, 1990; B.A., University of Nebraska-Lincoln, 1971, M.A., 1974, Ph.D., 1985.
- DE BOER, Darrell W., Professor and Acting Head of Agricultural Engineering, 1969; B.S., Iowa State University of Science and Technology, 1963, M.S., 1964, Ph.D., 1969.
- DeBOER, Delvin E., Associate Professor of Civil and Environmental Engineering, 1981; B.S., SDSU, 1978, M.S., 1980; Ph.D., Iowa State University of Science and Technology, 1990.
- DOBBS, Thomas L., Professor of Economics, 1978; B.S., SDSU, 1965; Ph.D., University of Maryland-College Park, 1969.
- DONOVAN, Kathleen, Assistant Professor of English, 1994; B.A., Spalding College, 1968; M.A., University of Nebraska, 1988; Ph.D., University of Arizona, 1994.
- DOOLITTLE, James J., Associate Professor of Plant Science, 1991; B.S., Purdue University, 1982; M.S., Texas A & M University, 1986; Ph.D., 1991.
- DUFFY, Walter G., Adjunct Associate Professor of Wildlife and Fisheries Sciences, 1988; B.S., Michigan State University, 1973, M.S., 1975, Ph.D., 1985.
- DUGGAN, Margaret M., Professor of English, 1978; B.A., St. John's University, 1958; M.A., Columbia University, 1965, Ph.D., 1972.
- DUVALL, Melvin R., Assistant Professor of Biology and Microbiology, 1994; B.A., Westmar College, 1977; M.S., University of Iowa, 1980; Ph.D., University of Minnesota/St. Paul, 1987.
- DWIVEDI, Chandradhar, Professor of Pharmaceutical Sciences, 1987; B.S., Gorakhpur University, 1964, M.S., 1966, Ph.D., 1972.
- EDEBURN, Carl E., Professor of Education, 1973; B.S., St. Cloud State University, 1963; M.A., University of Minnesota-Minneapolis/St Paul, 1969; Ph.D., University of North Dakota, 1973.
- ELBERT, Jeffrey J., Assistant Professor of Chemistry, 1994; B.S., Iowa State University, 1985; M.S., Northwestern Illinois University, 1986, Ph.D., 1990.
- ELLERBRUCH, Virgil G., Assistant Dean of Engineering, Professor of Electrical Engineering, 1967; Registered, Professional Engineer (SD); B.S., University of Wyoming, 1960, M.S., 1961, Ph.D., 1969.
- ELLSBURY, Michael M., Adjunct Associate Professor of Plant Science, 1992; B.A., University of Colorado, 1970; M.S., Colorado State University, 1974; Ph.D., Arizona State University, 1979.
- ENGSTROM, Royce, Adjunct Professor of Chemistry and Biochemistry, 1995, B.S., University of Nebraska, 1975; Ph.D., University of Wisconsin, 1979.
- ERICKSON, Alan K., Assistant Professor of Veterinary Science, 1990; B.A., Minot State College, 1983, 1984; Ph.D., North Dakota State University, 1989.
- ERION, Ralph L., Professor and Head of Education, 1985; B.A., Inter American University, 1972, M.A.Ed., 1975; Ph.D., Texas A&M University, 1985.
- EVANS, David A., Professor of English, 1968; B.A., Morningside College, 1962; M.A., University of Iowa, 1964; M.F.A., University of Arkansas, 1976.
- EVENSON Donald P., Distinguished Professor of Station BioChemistry, 1983; B.A., Augustana College, 1964; Ph.D., University of Colorado-Boulder, 1968.
- EVENSON, Paul D., Professor of Plant Science, 1959; B.S., University of Nebraska-Lincoln, 1957, M.S., 1959.
- EVERS, Sandra J., Professor and Head of Apparel Merchandising and Interior Design, 1982; B.S., Iowa State University of Science and Technology, 1960; M.A., University of Minnesota-Minneapolis/St Paul, 1964; Ph.D., Michigan State University, 1976.
- FAUSTI, Scott W., Associate Professor of Economics, 1991; B.A., North Dakota State University, 1986; M.S., University of Illinois, 1988; Ph.D., 1991.
- FENNELL, Anne, Assistant Professor of Horticulture, Forestry, Landscape and Parks, 1992; B.S., Iowa State University of Science and Technology, 1979; M.S., University of Minnesota-Minneapolis/St Paul, 1982, Ph.D., 1985.
- FERGUSON, Jerry L., Professor of Communication Studies and Theatre, 1970; B.S., SDSU, 1964; M.A., University of South Dakota, 1965; Ph.D., Southern Illinois University-Carbondale, 1973.
- FINCH, Robert G., Professor of Electrical Engineering, 1974; B.S., Michigan State University, 1958, M.S., 1960; Ph.D., Purdue University, 1974.
- FITZGERALD, John J., Professor of Chemistry, 1989; B.S., St. John's University, 1969; Ph.D., Illinois Institute of Technology, 1972.
- FIXEN, Paul, Adjunct Professor of Plant Science, 1981; B.S., SDSU, 1975, M.S., 1977; Ph.D., Colorado State University, 1979.
- FLAKE, Lester D., Professor of Wildlife and Fisheries, 1972; B.S., Brigham Young University, 1965, M.S., 1966; Ph.D., Washington State University, 1971.
- FLYNN, M.L., Associate Professor of English, 1990; Ph.B., DePaul University, 1969; M.A., University of Missouri, 1977; Ph.D., 1985.
- FOLAND, Kay L., Assistant Professor of Nursing, 1982; B.S.N., SDSU, 1980; M.S.N., University of Nebraska-Omaha, 1982; Ph.D., University of Texas-Austin, 1989.
- FRANCIS, David H., Professor of Veterinary Science, 1978; B.S., Brigham Young University, 1971, M.S., 1974; Ph.D., University of Missouri-Columbia, 1978.
- FRANKLIN, Sharon T., Assistant Professor of Dairy Science, 1993; B.S., Western Kentucky University, 1987; M.S., University of Kentucky, 1989; Ph.D., Iowa State University, 1993.
- FROEHLICH, Donell P., Professor and Head of Mechanical Engineering, Registered Professional Engineer (NE, SD), 1982; B.S., SDSU, 1972, M.S., 1973; Ph.D., Cornell University, 1976.
- FULLER, Billy W., Associate Professor of Plant Science, 1988; B.S., Auburn University, 1976, M.Ed., 1978; M.S., Clemson University, 1982; Ph.D., Louisiana State University, 1987.
- FUNCHION, Michael F., Professor of History, 1973; B.A., Iona College, 1966; M.A., Loyola University-Chicago, 1968, Ph.D., 1973.
- GALIPEAU, David W., Associate Professor of Electrical Engineering, 1992; 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; B.S., University of Wisconsin-Madison, 1978; M.S., Cornell University, 1982, Ph.D., 1984.
- GAMBILL, Norman R., Professor and Head of Visual Arts, 1984; B.A., Emory University, 1962; M.A., University of Iowa, 1966; Ph.D., Syracuse University, 1976.
- GARTNER, F. Robert, Director, West River Research & Extension Center, Professor of Animal and Range Sciences, 1969; B.S., University of Wyoming, 1950; M.S., University of California-Berkeley, 1956; Ph.D., University of Wyoming, 1967.
- GEHRKE, JR., Henry, Professor of Chemistry, 1964; B.S., Oklahoma State University, 1958; M.S., University of Iowa, 1963, Ph.D., 1964.
- GELDERMAN, Ronald H., Manager of Soil Lab and Associate Professor of Plant Science, 1973; B.S., SDSU, 1972, M.S., 1976; Ph.D., North Dakota State University, 1987.
- GHAZI, Hassan S., Professor of Mechanical Engineering, Registered Professional Engineer (OH, SD), 1984; B.S., Purdue University, 1954; M.S., The Ohio State University, 1956, Ph.D., 1962.
- GIBBONS, William Ray, Associate Professor of Biology and Microbiology, 1980; B.S., SDSU, 1980, M.S., 1982, Ph.D., 1987.

- GIBSON, Susan A., Assistant Professor of Biology and Microbiology, 1993; B.S., University of Oklahoma, 1974; M.S., 1981; Ph.D., 1989.
- GILBERT, Howard A., Professor of Economics, 1966; B.A., Central Bible College, 1957; B.S., Washington State University, 1961, M.A., 1962; Ph.D., Oregon State University, 1967.
- GILKERSON, Deanna S., Associate Professor of Human Development, Consumer and Family Sciences, 1977; B.S., SDSU, 1975; Ph.D., Iowa State University, 1993.
- GOOD, Linda A., Associate Professor of Human Development, Consumer and Family Sciences, 1995; B.S., Mankato State University, 1975; M.S., 1980; M.A.T., 1984; Ph.D., University of Minnesota, 1990.
- GRANHOLM, Nels H., Professor of Biology and Microbiology, 1971; B.A., University of Massachusetts-Amherst, 1964; Ph.D., Iowa State University of Science & Technology, 1968.
- GRITZNER, Charles F., Distinguished Professor of Geography, 1980; B.A., Arizona State University, 1958; M.A., Louisiana State University, 1960, Ph.D., 1969.
- GRITZNER, Janet L., Professor of Geography, 1980; B.A., University of Maryland-College Park, 1965, M.A., 1970; Ph.D., Louisiana State University, 1978.
- GROVE, John A., Professor of Chemistry, 1968; B.S., The Ohio State University, 1961, M.S., 1964, Ph.D., 1966.
- GUAN, Xiangming, Assistant Professor of Pharmaceutical Sciences, 1995; B.S., 1982; M.S., University of Kansas, 1988; Ph.S., 1991.
- HACKER, Patricia E., Associate Professor of Health, Physical Education and Recreation, 1991; B.Ed., Glenville State College, 1973; M.S., West Virginia University, 1983; Ph.D., University of Wyoming, 1988.
- HAERTEL, Lois S., Professor of Biology and Microbiology, 1969; B.S., University of Illinois-Urbana, 1961, M.S., 1963; Ph.D., Oregon State University, 1969.
- HALETA, Laurie, Associate Professor of Communication Studies and Theatre, 1977; B.S., SDSU, 1977; M.A., 1983; Ph.D., University of Nebraska, 1994.
- HALEY, Scott D., Assistant Professor of Plant Science, 1993; B.S., Washington State University, 1983; M.S., Colorado State University, 1989; Ph.D., 1992.
- HAMIDZADEH, Hamid R., Professor of Mechanical Engineering, 1986; B.S., Arya Meher University, 1974; M.S., Imperial College (University of London), 1975, Ph.D., 1978.
- HAMMACK, Leslie, Adjunct Assistant Professor of Plant Science, 1994; B.A., State University of New York, 1966; M.S., University of Wisconsin, 1970; Ph.D., 1994.
- HANSON, Clark W., Professor of Education, Supervisor of Agricultural Education, 1973; B.S., University of Minnesota-Minneapolis/St Paul, 1963, M.A., 1971; Ph.D., Iowa State University of Science & Technology, 1972.
- HARPER, Ruth, Assistant Professor of Counseling and Human Resource Development, 1994; B.A., Cornell College, 1973; M.S.Ed., University of Wisconsin, 1977; Ph.D., Kansas State University, 1987.
- HASSOUN, M. Nadim, Professor of Civil and Environmental Engineering, 1980; B.S., Cairo University, 1956; M.S., University of Michigan-Ann Arbor, 1966, Ph.D., 1968.
- HEATER, Barbara S., Professor and Head of Graduate Nursing, 1996; B.S.N., St. Louis University, 1976; M.S.N., 1980; Ph.D., 1984.
- HECHT, Harry G., Professor of Chemistry, 1973; B.S., Brigham Young University, 1958, M.S., 1959; Ph.D., University of Utah, 1962.
- HEGGE, Margaret J., Distinguished Professor of Nursing, 1974; B.A., Gustavus Adolphus College, 1969; M.Ed., SDSU, 1972; M.S., University of Minnesota-Minneapolis/ St Paul, 1984; Ed.D., University of South Dakota, 1983.
- HELDER, Dennis L., Associate Professor of Electrical Engineering, Director of Engineering and Environmental Resource Center, 1983; B.S., SDSU, 1979; B.S., 1980; M.S., 1985; Ph.D., North Dakota State University, 1991.
- HELLICKSON, Mylo A., Associate Dean & Director of Cooperative Extension Service; Professor of Agricultural Engineering, 1969; B.S., North Dakota State University, 1964, M.S., 1966; Ph.D., West Virginia University, 1969.
- HELLING, Mary Kay, Associate Professor and Head of Human Development, Consumer and Family Sciences, 1978; B.S., SDSU, 1977, M.S., 1982; Ph.D., Purdue University, 1992.
- HENNING, David R., Associate Professor of Dairy Science, Alfred Chair in Cheese Chemistry and Technology, 1990; B.S., University of Illinois, 1962; Ph.D., Oregon State University, 1966.
- HESS, Donna J., Professor of Rural Sociology, 1974; B.A., Marquette University, 1965; M.A., State University of New York-Binghamton, 1971; Ph.D., Michigan State University, 1974.
- HIGGINS, Kenneth F., Adjunct Professor of Wildlife and Fisheries Science (USDI), 1985; B.S., Colorado State University, 1965; M.S., SDSU, 1968; Ph.D., North Dakota State University, 1981.
- HILDERBRAND, David C., Director of SDSU Programs-Sioux Falls Site, Professor of Chemistry, 1974; B.A., Southwest Baptist College, 1967; M.A., University of Missouri-Columbia, 1969, Ph.D., 1971.
- HILDRETH, Michael, Associate Professor of Biology and Microbiology, 1987; B.A., Westmar College, 1977; Ph.D., Tulane University of Louisiana, 1983.
- HILLNER, Kenneth, Professor and Head of Psychology, 1969; B.A., Dartmouth College, 1960; Ph.D., Indiana University 1965.
- HOFLAND, Sharon A., Professor of Nursing, 1972; B.S., SDSU, 1972, M.S., 1972, Ph.D., 1976; M.N., University of Washington, 1979.
- HOGAN, Edward P., Assistant Vice President for Academic Affairs and Professor of Geography, 1967; B.S., St. Louis University, 1961, M.A., 1962, Ph.D., 1969.
- HOUGLUM, Joel E., Professor of Pharmaceutical Sciences, 1979; B.S., University of Minnesota, 1972; Ph.D., University of Wisconsin-Madison, 1979.
- HUBBARD, Daniel E., Associate Professor of Wildlife and Fisheries Sciences, 1980; B.S., Michigan State University, 1975; M.S., SDSU, 1979; Ph.D., 1988.
- HUMBURG, Daniel, Associate Professor of Agricultural Engineering, 1985; B.S., University of Wisconsin, 1982; M.S., SDSU, 1987; Ph.D., University of Illinois, 1991.
- HURLEY, David J., Associate Professor of Biology and Microbiology, 1989; B.A., University of Wisconsin-Milwaukee, 1977; Ph.D., Pennsylvania State University, 1988.
- HUTCHESON, JR., H. L., Professor of Biology and Microbiology, 1965; B.S., Oklahoma State University, 1960, M.S., 1963, Ph.D., University of Oklahoma, 1965.
- JANSEN, Larry L., Professor of Economics, 1978; B.S., University of Nebraska-Lincoln, 1971, Ph.D., 1978; M.S., Oklahoma State University, 1974.
- JENKS, Jonathan A., Associate Professor of Wildlife and Fisheries Science, 1991; B.S., Unity College, 1984; M.S., University of Maine-Orono, 1986; Ph.D., Oklahoma State University, 1991.
- JENSEN, Darrell M., Dean of the College of Education and Counseling, Professor of Education, 1971; B.S., Northwest Missouri State University, 1959; M.A., Drake University, 1965; Ph.D., University of Iowa, 1971.
- JENSEN, William P., Professor of Chemistry, 1967; B.S., University of Minnesota-Minneapolis/St Paul, 1959; M.S., University of Iowa, 1962, Ph.D., 1964.
- JIN, Yue, Assistant Professor of Plant Science, 1995; B.S., 1982; M.S., North Dakota State University, 1988, 1990; Ph.D., 1990.
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- BLAZEY, Charles H., Professor Emeritus of Health Science, Professor Emeritus of Health, Physical Education and Recreation, 1965; B.S., University of State of New York (Brookport), 1959, M.S., 1960; Ed.D., University of Oregon, 1971.
- BRAGE, Burton, Associate Dean Emeritus of Agriculture and Biological Sciences, Director of Resident Instruction, Professor Emeritus of Plant Science, 1950; B.S., University of Minnesota, 1946, Ph.D., 1950.
- BRIGGS, Hilton M., President Emeritus, Distinguished Professor of Agriculture, 1958; B.S., Iowa State University, 1933; M.A., North Dakota State University, 1935; Ph.D., Cornell University, 1938; D.Sc., (Honorary) North Dakota State University, 1963; Doctor of Higher Education Administration (Honorary), University of South Dakota, 1974.
- BROWN, Mary Margaret, Professor Emeritus of English, 1955; B.A., Briar Cliff College, 1938; M.A., University of South Dakota, 1947, Ed.D., 1964.
- BUCHENAU, George W., Professor of Plant Science, 1959; B.S., New Mexico State University, 1954; M.S. 1955; Ph.D., Iowa State University, 1960.
- BUSH, Leon F., Associate Professor Emeritus of Animal Science, 1954; B.S., University of Kentucky, 1950, M.S., 1951; Ph.D., Cornell University, 1954.
- CARLSON, Wendell, Professor Emeritus of Animal Science, Leader of Poultry Research and Extension Section, 1948; B.S., Colorado State University, 1942; M.S., Cornell University, 1948, Ph.D., 1949.
- CARSON, Paul, Professor Emeritus of Plant Science, 1948; B.S., Northwest Missouri State University, 1941; M.S., Iowa State University, 1947.
- CHEN, Chen-Ho, Professor Emeritus of Biology and Microbiology, 1968; B.S., National Taiwan University, 1954; M.S., Louisiana State University, 1960; Ph.D., SDSU, 1964.
- CHRISTIANSON, Kenneth D., Professor Emeritus of Mechanical Engineering, 1955; B.S., SDSU, 1949, M.S., 1958.
- CRABBS, Geraldine, Associate Professor Emeritus of Health, Physical Education and Recreation, 1953; B.A., University of Northern Iowa, 1933; M.S., University of Colorado, 1958.
- DEARBORN, Delwyn D., Professor Emeritus of Animal and Range Sciences, 1956; B.S., SDSU, 1954; M.S., 1959; Ph.D., University of Nebraska, 1970.
- DENTON, Clarence E., Professor Emeritus of Speech, 1956; B.S., University of Nebraska, 1950; M.A., Louisiana State University, 1954; M.F.A., University of Minnesota, 1965.
- DERSCHIED, Lyle A., Professor Emeritus of Plant Science, 1946; B.S., SDSU, 1943, M.S., 1948; Ph.D., Iowa State University, 1951.
- DINKEL, C. A., Professor Emeritus of Animal Science, 1951; B.S., Iowa State University, 1948; M.S., SDSU, 1949; Ph.D., Iowa State University, 1953.
- DORNBUSH, James N., Professor Emeritus of Civil Engineering, 1949, Registered Professional Engineer (MN) 1949; B.S., SDSU, 1949; M.S., University of Minnesota, 1959; D.Sc., Washington University, 1962.
- DRACY, Arthur E., Professor Emeritus of Biological Engineering, 1948; B.S., University of Minnesota, 1943, M.S., 1946, Ph.D., 1949.
- DUFFEY, W. George, Professor Emeritus of Physics, 1945; B.A., Cornell College, 1942; M.A., Princeton University, 1944, Ph.D., 1945.
- DYBING, C. Dean, Professor Emeritus of Plant Science, 1960; B.S., Colorado State University, 1953, M.S., 1955; Ph.D., University of California, 1959.
- EMBRY, Lawrence B., Professor Emeritus of Animal Science, 1950, 1960; B.S., University of Kentucky, 1942; M.S., Cornell University, 1948, Ph.D., 1950.
- EMERICK, Royce J., Professor Emeritus of Station Biochemistry, 1957; B.S., Oklahoma State University, 1952; M.S., University of Wisconsin-Madison, 1955, Ph.D., 1957.
- FOREMAN, Ruth J., Professor Emeritus of English, 1962; B.S., SDSU, 1961, M.S., 1964; D.A., Drake University, 1982.
- FINE, Lawrence O., Professor Emeritus of Plant Science, 1946; B.S., North Dakota State University, 1938; Ph.D., University of Wisconsin, 1941.
- FORSYTH, Harry L., Professor Emeritus of Health, Physical Education and Recreation, Director of Athletics, 1955; B.S., SDSU, 1951, M.S., 1956; D.P.Ed., Springfield College, 1970.
- GARDNER, Wayne S., Professor Emeritus of Plant Science, 1967; B.S., Utah State University, 1950, M.S., 1951; Ph.D., University of California, 1967.
- GILBERT, Ardyce, Dean Emeritus of Home Economics, Professor of Home Economics Education, 1966; B.S., SDSU, 1959; M.S., Iowa State University, 1966, Ph.D., 1974.
- GREENBAUM, Harry, Professor Emeritus of Economics, 1961; B.S., Texas A&M University, 1955; M.S., The Ohio State University, 1956, Ph.D., 1961.
- HALVERSON, Andrew W., Professor Emeritus of Station Biochemistry, 1949; B.S., SDSU, 1943; M.S., University of Wisconsin, 1947, Ph.D., 1949.
- HEITBRINK, Bernard E., Professor and Head of Pharmacology, 1964; B.S., SDSU, 1958; Ph.D., University of Chicago, 1961.
- HENDRICKSON, John P., Professor Emeritus of Political Science, 1954; B.A., University of Iowa, 1947; M.A., University of Minnesota, 1949; Ph.D., University of Iowa, 1952.
- HOOGESTRAAT, Wayne E., Professor Emeritus of Speech, 1960; B.A., Sioux Falls College, 1951; M.A., University of South Dakota, 1953; Ed.D., Pennsylvania State University, 1963.
- HORTON, Maurice L., Professor Emeritus of Plant Science, 1964; B.S., Purdue University, 1953, M.S., 1959; Ph.D., Iowa State University, 1962.
- HSIA, Felix H., Professor Emeritus of Economics, 1963; B.S., University of Nanking (China), 1942; M.S., University of Wisconsin, 1953, Ph.D., 1960.
- HUETHER, Ervin, Professor Emeritus of Health, Physical Education and Recreation, Head Baseball Coach, 1949; B.A., Yankton College, 1943; M.Ed., University of Minnesota, 1950.
- HUGGHINS, Ervin, Professor Emeritus of Biology, 1952; B.S., Baylor University, 1943; M.S., Texas A&M University, 1949; Ph.D., University of Illinois, 1952.
- JOHNSON, Elmer R., Professor Emeritus of Chemistry, 1946; B.S., SDSU, 1933; Ph.D., University of Wisconsin, 1940.
- JOHNSON, Genevieve B., Professor Emeritus of Nursing, 1956; B.S., SDSU, 1944; M.S., Vanderbilt University, 1945; Ed.D., Columbia University, 1955.
- KANTACK, Benjamin H., Professor Emeritus of Plant Science, 1962; B.S., Kansas State University, 1951; M.S., Oklahoma State University, 1954; Ph.D., University of Nebraska, 1963.
- KENEFICK, Donald G., Professor Emeritus of Plant Science, 1959; B.S., University of Wisconsin-Madison, 1951; Ph.D., Michigan State University, 1959.
- KINCH, Raymond, Professor Emeritus of Plant Science, M.S., University of Nebraska, 1936.
- KIRKBRIDE, Clyde A., Professor Emeritus of Veterinary Science, Associate Professor of Microbiology, 1967; D.V.M., Oklahoma State University, 1953; M.S., SDSU, 1970.
- KLUG, Harlan L., Professor Emeritus of Chemistry, 1947; B.S., SDSU, 1930; M.S., University of South Dakota, 1944; Ph.D., University of Wisconsin, 1949.
- KNABACH, Wayne E., Professor Emeritus of Electrical Engineering, 1957, Registered Professional Engineer (SD); B.S., SDSU, 1949, M.S., 1961.
- KOHLER, Paul H., Professor Emeritus of Animal Science, 1950; B.S., SDSU, 1949, M.S., 1950; Ph.D., University of Minnesota, 1959.
- KOHLMEYER, William, Professor Emeritus of Animal Science and Economics, 1944; B.S., Iowa State University, 1928; M.S., Purdue University, 1938.
- KRANZLER, Albert W., Professor Emeritus of Mathematics, 1943; B.S., University of North Dakota, 1937; M.S., University of Minnesota, 1950.

- LAIRD, Ruth, Associate Professor Emeritus of Journalism, 1966; B.A., Cornell College, 1935; M.A., University of Iowa, 1966.
- LEWIS, James K., Professor Emeritus of Animal Science, 1950; B.S., Colorado State University, 1948; M.S., Montana State University 1950.
- LINDER, Raymond L., Professor Emeritus of Wildlife and Fisheries Sciences, B.S., University of Nebraska, 1953; M.S. Iowa State University, 1955; Ph.D., University of Nebraska, 1964.
- LUND, Lillian O., Professor Emeritus of Apparel Merchandising and Interior Design, 1944; B.A., St. Olaf College, 1930; M.S., University of Minnesota, 1944.
- LUNDEEN, Ardelle A., Professor Emeritus of Economics, 1976; B.S., SDSU, 1970, M.S., 1971; Ph.D., Iowa State University of Science and Technology, 1976.
- LUTHER, Richard M., Professor Emeritus of Animal Science, 1954; B.S., SDSU, 1954, M.S., 1959; Ph.D., Iowa State University, 1964.
- LYLE, Mary Frances, State Home Demonstration Leader Emeritus; Ph.D. University of Wisconsin, 1958.
- LYTLE, William F., Associate Professor Emeritus of Agricultural Engineering, 1961; Registered Professional Engineer (IL, SD); B.S., University of Illinois, 1939, B.S., 1940, M.S., 1948.
- MANKIN, Cleon J., Professor Emeritus of Plant Science, 1953; B.S., New Mexico Highlands University, 1938; M.S., New Mexico State University, 1950; Ph.D. Washington State College, 1953.
- MARKEN, Jack W., Professor Emeritus of English, 1967; B.A., University of Akron, 1947; M.A., Indiana University, 1950, Ph.D., 1953.
- McCARTY, J. Walters, Professor Emeritus of Animal Science, Director of International Programs, 1948; B.S., SDSU 1947; M.S., University of Minnesota, 1948.
- McCONE, William C., Associate Professor Emeritus of Animal Science, 1947; B.S., SDSU, 1943, M.S., 1950.
- MEYER, Edward L., Professor Emeritus of Speech, 1965; 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; B.S., SDSU, 1948; M.S., University of Kansas, 1951, Ph.D., 1953.
- McDANIEL, Burruss, Professor Emeritus of Plant Science, 1966; B.A., University of Alaska, 1953; M.S., Texas A&M University, 1961; Ph.D., 1965.
- MINYARD, Joseph A., Extension Livestock Specialist, Professor Emeritus of Animal Science, 1953; B.S., West Texas State University, 1951; M.S., SDSU, 1959.
- MOE, Dennis L., Professor Emeritus of Agricultural Engineering, B.A., SDSU, 1948, M.S., 1949; D.Sc., Augustana College, 1971.
- MOORE, Raymond A., Associate Dean Emeritus of Agriculture and Biological Sciences, Director of Agricultural Experiment Station, Professor of Plant Science, 1956; B.S., SDSU, 1951, M.S., 1958; Ph.D., Purdue University, 1963.
- MORGAN, JR., Walter C., Professor Emeritus of Animal Science, Professor Emeritus of Biology, 1954; B.S., University of Connecticut, 1946; M.S., George Washington University, 1949; Ph.D., University of Connecticut, 1953.
- MYERS, Gerald A., Professor Emeritus of Biology and Microbiology, 1958; B.A., Kearney State College, 1951; M.A., University of Northern Colorado, 1957; Ph.D., SDSU, 1963.
- OLSON, Oscar E., Professor Emeritus of Chemistry, 1937; B.S., SDSU, 1936, M.S., 1937; Ph.D., University of Wisconsin, 1948.
- PENGRA, Robert M., Professor Emeritus of Microbiology, 1957; B.S., SDSU, 1951, M.S., 1953; Ph.D., University of Wisconsin.
- PETERSON, Evelyn T., Professor Emeritus of Nursing, 1954, 1977; B.S., University of Washington, 1951, M.N., 1958; D.Nu.S., University of California, 1975.
- PETERSON, Ronald M., Professor Emeritus of Horticulture-Forestry, 1953; B.S., Colorado State University, 1947; M.S., University of California, 1949; Ph.D., University of Minnesota, 1953.
- PRASHAR, Paul D., Professor Emeritus of Horticulture, Forestry, Landscape and Parks, 1960; B.S., Government Agricultural College (Ludhiana, India), 1952; M.S., University of Minnesota-Minneapolis/St Paul, 1955; Ph.D., University of Missouri-Columbia, 1960.
- RANEY, A. Leon, Dean of Libraries, Professor of Library Science, 1972; B.S., University of Central Arkansas, 1960; M.S., Louisiana State University, 1962; Ph.D., Indiana University-Bloomington, 1972.
- RICHARDSON, Jay R., Professor Emeritus of Human Development, Consumer and Family Sciences, 1963; B.S., Brigham Young University, 1957, M.S., 1958; Ed.D., Pennsylvania State University, 1969.
- ROBINSON, Glenn, Professor Emeritus of Health, Physical Education and Recreation, 1957; B.A., Monmouth College, 1932; M.A., Columbia University, 1942.
- SANDFORT, John F., Professor Emeritus of Mechanical Engineering, 1958; B.M.E., The Ohio State University, 1933, B.S., 1934; M.S., Iowa State University, 1948.
- SAUER, Howard M., Professor Emeritus of Rural Sociology, 1938; B.A., Des Moines University, 1929; M.A., Iowa State University, 1931.
- SCHOLTEN, Marvin M., Professor Emeritus of Education, 1956; B.A., University of Minnesota, 1949; M.A., University of South Dakota, 1950, Ed.D., 1967.
- SEMIENIUK, Alexandra O., Professor Emeritus of Apparel Merchandising and Interior Design, 1959; B.S., SDSU, 1955, M.S. 1961.
- SHANK, D. Boyd, Professor Emeritus of Plant Science, 1946; B.S., University of Nebraska, 1935; Ph.D., Iowa State University, 1941.
- SHUBECK, Fred E., Professor Emeritus of Plant Science, 1951; B.A., SDSU 1940; Ph.D., University of Minnesota, 1951.
- SKUBIC, Louis G., Professor Emeritus of General Engineering, 1954; B.S., University of Minnesota, 1947, M.A., 1953.
- SOGN, Arthur, Associate Professor Emeritus of Economics, 1968; B.S., SDSU, 1948, M.S., 1959.
- SPURGEON, Kenneth R., Professor Emeritus of Dairy Science, 1958; B.S., Purdue University, 1942, M.S., 1948; Ph.D., University of Wisconsin, 1951.
- STINE, Lawrence C., Professor Emeritus of Speech, Director Emeritus of Theatre, Associate Dean Emeritus of Arts and Science, 1952; B.A., Butler University, 1947; M.A., University of Iowa, 1951, Ph.D., 1962.
- STOFLET, Dorothy, Professor Emeritus of Textiles, Clothing and Interior Design, 1963; B.A., Coe College, 1933; M.S., Iowa State University, 1948.
- STORRY, Junis O., Amdahl Distinguished Professor of Engineering; Director Emeritus, Engineering Experiment Station; Director Emeritus, Engineering Extension, 1946; B.S., SDSU, 1942; Ph.D., Iowa State University, 1967.
- TAYLOR, Charles A., Professor Emeritus of Botany, 1949; B.S., Cornell University 1935, M.S., 1939.
- TAYLOR, Donald C., Professor Emeritus of Economics, 1980; B.S., Cornell University, 1959; M.S., University of Minnesota, 1964; Ph.D., 1965.
- THOMPSON, John E., Professor Emeritus of Economics, 1952; B.S., University of South Dakota, 1950; M.S., SDSU, 1953; Ph.D., University of Wisconsin, 1960.
- TRUMP, Alfred G., Professor Emeritus of Library Science; B.A., University of Michigan, 1933, M.A., 1938.
- TUCKER, W. Lee, Experiment Station Statistician, Professor Emeritus of Mathematics and Statistics, 1963; B.S., University of Kentucky, 1952; M.S., North Carolina State University-Raleigh, 1957, Ph.D. 1963.
- VOLSTORFF, Vivian, Dean Emeritus of Women, Professor Emeritus of History, 1932, 1973; A.B., Elgin Junior College, 1926; B.S., Northwestern University, 1928, M.A., 1929, Ph.D., 1932.
- WADSWORTH, William, Professor Emeritus of Chemistry, 1963; B.S., Trinity College, 1950, M.S., 1952; Ph.D., Pennsylvania State University, 1956.
- WAHLSTROM, Richard C., Professor Emeritus of Animal Science, 1952; B.S., University of Nebraska, 1948; M.S., University of Illinois, 1950, Ph.D., 1952.
- WALSTROM, Robert J., Professor Emeritus of Plant Science, 1955; B.S., University of Nebraska, 1947, M.S., 1949; Ph.D., Iowa State University, 1955.
- WEBSTER, Victor, Professor Emeritus of Chemistry, 1936; B.A., Iowa State University, 1930, M.S., 1931, Ph.D., 1933.
- WELLS, Darrell G., Professor Emeritus of Plant Science, 1962; B.S., SDSU, 1941; M.S., Washington State University, 1943; Ph.D., Iowa State University, 1949.
- WENTZY, Woodrow P., Associate Professor Emeritus of Journalism, Supervisor Emeritus of Instructional TV, 1938; B.S., SDSU, 1938; M.A., University of Oklahoma, 1950.

WESTIN, Frederick C., Professor Emeritus of Plant Science, 1947; B.S., University of Wisconsin, 1941, M.S., 1947, Ph.D., 1952.

WHITE, Everett M., Professor Emeritus of Plant Science, 1954; B.S., Iowa State University, 1948, M.S., 1950, Ph.D., 1953.

WHITEHEAD, Eugene I., Professor Emeritus of Station Biochemistry, 1941; B.S., SDSU, 1939, M.S., 1941.

WIDVEY, Harold, Professor Emeritus of Communication, Studies and Theatre, 1972; B.S., Ed., Northern State College, 1957; M.S. Ed., 1961; Ph.D., University of Nebraska, 1971.

WIERSMA, John, Professor Emeritus of Agricultural Engineering, Director Emeritus of Water Resources Institute, 1943; Registered Engineer (SD); B.S., SDSU, 1943, M.S., 1950; Ph.D., University of California, 1970.

WILLIAMS, Perry W., Professor Emeritus of Physics, 1936; B.A., Dakota Wesleyan University, 1936; M.S., SDSU, 1940.

WILLIAMSON, Warren, Professor Emeritus of Health, Physical Education, and Recreation, Coordinator Emeritus of Intramurals and Recreation, 1956; B.S., SDSU, 1951, M.S., 1954.

WILLS, Rena, Professor Emeritus of Nutrition and Food Science, 1952; B.S., Iowa State University, 1940, M.S., 1946.

WOOD, Leon S., Extension Plant Pathologist, Professor Emeritus of Plant Science, 1955; B.S., Kent State University, 1949; M.S., The Ohio State University, 1951; Ph.D., University of Minnesota, 1958.

YARBROUGH, Jerry W., Professor Emeritus of English, 1968; B.A., Abilene Christian University, 1960; M.A., University of Texas-Austin, 1962, Ph.D., 1968.

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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 in this Bulletin on page 135.
2. \$15.00 application fee. Students seeking readmission or having attended a South Dakota state-supported school previously need not submit an application fee, but this attendance must be noted on the application form. 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 course work.
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. Signed letters of recommendation may be submitted on plain paper or letterhead, if desired, or recommenders may use the forms included in this Bulletin on pages 132-134.
5. The GRE test is required of all applicants into Agronomy, Biology, Electrical Engineering, English, Entomology, HPER, Microbiology, Pharmaceutical Sciences (program is currently not admitting any students), Plant Pathology, and Wildlife and Fisheries (highly recommended).
6. Some programs require additional reference letters or department application forms. 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
Admin. Bldg. 130

Graduate School Personal Reference Form

To the Applicant:

This form should be given to professors who are able to comment on your qualifications for graduate study. You should not request a recommendation from a non-academic person unless you have been away from academic institutions for some time. In that case, you should request the recommendation from someone knowing your academic ability.

A. Applicant's Name _____ Degree Sought _____

B. Applicant's Social Security Number _____ Graduate Program _____

C. List the courses you took under the direction of the person completing this form, if applicable.

Course Number	Course Title	When Taken	Grade

D. Describe personal contact with person furnishing reference:

Applicant's Waiver of Right to Access

The Family Educational Rights and Privacy Act of 1974, as amended, (PL 93-380), allows a candidate for admission to waive his or her right of access to confidential letters or statements written in his or her behalf if the recommendation is used solely for the purposes of admission and if the candidate, upon request, is notified of the names of all persons making such recommendations on his or her behalf. The University does not require that you make such a waiver as a condition for admission. However, under the legislation you have the option of signing such a waiver as follows:

I hereby voluntarily waive, do not waive my right to examine this confidential evaluation.

Name _____ Date _____ Signature _____
Please Print

To the Person Completing This Form:

The student 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. above were taken under my direction. Yes 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

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, as 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 student'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	Doctoral Program	Masters Program
I strongly recommend for	<input type="checkbox"/>	<input type="checkbox"/>
I recommend for	<input type="checkbox"/>	<input type="checkbox"/>
I recommend with reservations for	<input type="checkbox"/>	<input type="checkbox"/>
I do not recommend for	<input type="checkbox"/>	<input type="checkbox"/>

Signature of recommender _____ Date _____

Name _____ Title _____
Print or type

Institution _____

Address _____ Telephone _____



APPLICATION FOR GRADUATE ADMISSION OR READMISSION

Graduate School, Box 2201, South Dakota State University, Brookings, South Dakota 57007

1. Name _____
(Last) (Other or Former Name, if any) (First) (Middle)

2. Social Security No. _____ * 3. Date of Birth _____ / _____ / _____
month day year

4. Permanent Address _____
(All SDSU correspondence will be sent to this address.) Street, RFD, or Box City State or Country Zip Code

5. Local Address _____
Street, RFD, or Box City State Zip Code

6. Home Phone _____ Work Phone _____

7. Place of Birth _____ 8. Married Unmarried Separated/Divorced
City State or Country

9. Did either of your parents graduate from a South Dakota public college or university? YES NO

10. Citizen of what country _____ 11. Legal Resident of _____
County State

12. Emergency Contact _____
Name Address Phone Relationship

13. Required for Civil Rights/Affirmative Action Reporting:

- Gender: Male, Female
- Ethnic Group: White, Black, Asian, American Indian, Hispanic
- Citizenship: Native Born, Naturalized, Resident Alien, Alien: Immigration Classification _____
- Handicapped: Audio, Visually, Learning Disabled, Mobility - Ambulatory, Mobility - Wheel Chair, Mental/Psychological

14. Term graduate work will begin: Fall Spring Summer Only Summer then Fall - Year _____

15. Specify Location of Coursework: Brookings, Other _____

16. Will you be pursuing a degree at SDSU at this time? No, Answer question 17 Yes, answer questions 17 THRU 20

17. A Bachelor's degree from an accredited institution is a prerequisite for pursuing graduate work. Official transcripts of academic work from each institution must be submitted for admission to a graduate program. Non-degree admission requires only bachelor's degree certification.

Institution Bachelor's Degree Earned _____ Dates Attended _____

Other Institution Attended and/or Degree Earned _____ Dates Attended _____

Other institution Attended and/or Degree Earned _____ Dates Attended _____

18. Standardized admissions tests taken (GRE, MAT, TOEFL). TOEFL required for international students.

Name of Test _____ Latest date test taken _____ Score _____

19. Master of Arts, Master of Science Teaching, Master of Science, Master of Education, Doctor of Philosophy
(Degree seeking students must have a completed application on file, i.e. transcripts from all schools attended, references etc.)

20. Major department _____ Degree Program/area of interest _____

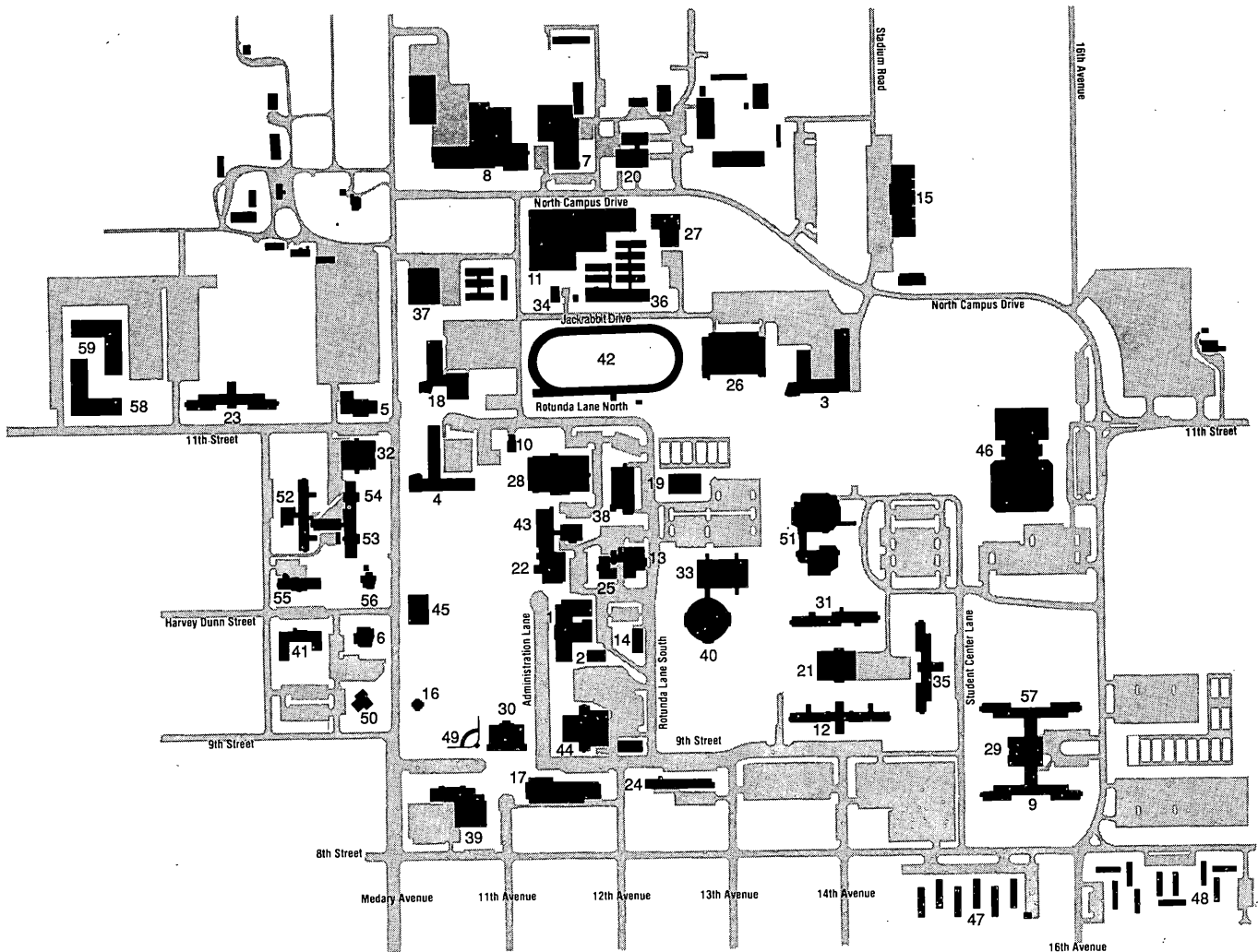
I hereby certify that I am registered with the Selective Service pursuant to the Military Selective Service Act, 50 USC 453, as amended and in effect on January 1, 1988, or for a reason specified in 50 USC 453, I am not required to be registered.

All answers I have given on this application are complete and accurate to the best of my knowledge. If admitted, I agree to observe the rules and regulations of South Dakota State University and to pay all fees and charges assessed thereunder.

Signature of Applicant _____ Date _____

Notice: South Dakota State University is an Affirmative Action/Equal Opportunity Employer (Male/Female) and offers all benefits, services, education and employment opportunities without regard for ancestry, age, race citizenship, color, creed, religion, gender, disability, national origin, sexual preference, or Vietnam Era veteran status. Women and minorities are encouraged to apply. Proof of eligibility is required for employment by the Immigration Reform and Control Act of 1986.

* According to Public Law 93-579 it shall be unlawful for any federal, state or local government agency to refuse admission based on the individual's refusal to disclose his or her social security number.



Legend

- | | | | |
|---|---|--|--|
| 1 Administration Building | 15 Coughlin-Alumni Stadium | 32 Medary Commons | 46 Stanley J. Marshall
HPER Center |
| 2 Agricultural
Communications Center | 16 Coughlin Campanile | 33 Nursing - Family and Consumer
Sciences - Arts and Science | 47 State Court |
| 3 Agricultural Engineering | 17 Crothers Engineering Hall | 34 Physiology Laboratory | 48 State Village |
| 4 Agricultural Hall | 18 Dairy Microbiology | 35 Pierson Hall | 49 Sylvan Theatre |
| 5 Agricultural Heritage
Museum | 19 DePuy Military Hall | 36 Plant Science Building | 50 Tompkins Alumni Center |
| 6 Alvilda M. Sorenson
Family Resource and
Management Center | 20 Foundation Seed
Conditioning Plant | 37 Plant Science Seedhouse | 51 University Student Union |
| 7 Animal Disease Research
and Diagnostic Laboratory | 21 Grove Hall | 38 Printing and Journalism
Building (includes U.S.
Postal Service) | 52 Waneta Hall |
| 8 Animal Science Complex | 22 Guilford C. Gross
Pharmacy Building | 39 Pugsley Continuing
Education Center | 53 Wecota Hall |
| 9 Binnewies Hall | 23 Hansen Hall | 40 Rotunda for Arts and
Science | 54 Wenona Hall |
| 10 Biology Annex | 24 Harding Hall | 41 Scobey Hall | 55 West Hall |
| 11 N Plains Bio-Stress Laboratory | 25 Heat/Power Laboratory | 42 Sexauer Field | 56 Woodbine Cottage
(President's Residence) |
| 12 Brown Hall | 26 H.M. Briggs Library | 43 Shepard Hall | 57 Young Hall |
| 13 Central Heating Plant | 27 Horticulture - Forestry | 44 Solberg Hall | 58 Berg Hall |
| 14 Communications Center | 28 Intramural Building | 45 South Dakota Art Museum | 59 Bailey Hall |
| | 29 Larson Commons | | |
| | 30 Lincoln Music Hall | | |
| | 31 Mathews Hall | | |



Graduate School

Box 2201
South Dakota State University
Brookings, SD 57007