

South Dakota State University  
**Open PRAIRIE: Open Public Research Access Institutional  
Repository and Information Exchange**

---

Undergraduate and Graduate Catalogs

Office of the Registrar

---

6-1986

## South Dakota State University General Catalog 1986-1988

South Dakota State University

Follow this and additional works at: [http://openprairie.sdstate.edu/registrar\\_catalogs](http://openprairie.sdstate.edu/registrar_catalogs)

---

### Recommended Citation

South Dakota State University, "South Dakota State University General Catalog 1986-1988" (1986). *Undergraduate and Graduate Catalogs*. 31.

[http://openprairie.sdstate.edu/registrar\\_catalogs/31](http://openprairie.sdstate.edu/registrar_catalogs/31)

This Catalog is brought to you for free and open access by the Office of the Registrar at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in Undergraduate and Graduate Catalogs by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact [michael.biondo@sdstate.edu](mailto:michael.biondo@sdstate.edu).

South Dakota

SHAWNEE

v. 76  
no. 2  
1986  
June

378.783  
So87.1  
c.1

University

1986-1988 General Catalog

SDSU LIBRARY - BROOKINGS, SD



3 1574 00338 9134



**South Dakota Room**

Hilton M. Briggs Library  
South Dakota State University

# General Catalog 1986-88

## Table of Contents

About South Dakota State University	4	Associate Degree and Certificate Programs	27
Admission Policies and Procedures	7	Agriculture and Biological Sciences	30
Academic Information	14	Arts and Science	34
The Summer Session	22	Education	38
Division of Lifelong Learning and Outreach	22	Engineering	41
The Graduate School	22-23	General Registration	44
Campus Services to Assist the University Community	23	Home Economics	48
Academic Support Services	25	Nursing	50
How to Read Catalog Entries	26	Pharmacy	51
		Departments of Instruction	53

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

Volume 76

Number 2

June 1986

Published quarterly by South Dakota State University Second Class postage paid at Brookings, SD 57007 Postmaster: send change of address to: Vice President for Academic Affairs, South Dakota State University, Box 2201, Brookings, SD 57007-2098

Due to conditions which may arise beyond the control of South Dakota State University, statements in this catalog may be changed during the 1986-87 and 1987-88 school years without notice. In so far as possible, courses listed and approved by the Regents of Education will be offered, but the university reserves the right to modify any statement in accordance with finances and other unforeseen conditions.

The contents of this catalog are believed to be accurate as of its date of publication. They cannot, however, be considered to be contractually binding and are presented for background information only.

Notice: South Dakota State University offers all educational programs, materials, and services to all people without regard to age, race, color, religion, sex, handicap, or national origin, and is an Affirmative Action/Equal Opportunity Employer (Male/Female).

378.783 Archives  
 So 87.1  
 v.76 no.2  
 1986  
 June  
 c.1  
 #15378529

# 1986-1987 University Calendar

## 1986 Fall Semester

**(1 day registration, 72 class days, 5 exam days)**

- September 2, Tuesday ..... Registration
- September 3, Wednesday ..... Instruction begins
- September 17, Wednesday ..... Last day to add or drop a course and adjust final fees
- September 29, Monday ..... Last day to submit graduation card for Fall 1986 graduates
- October 11, Saturday ..... Hobo Day
- October 22, Wednesday ..... First half of semester ends
- October 29, Monday ..... Deficiency reports due in Registrar's office by 5:00 pm
- November 11, Tuesday ..... Veteran's Day Holiday
- November 12, Wednesday, ..... Last day to drop a course; Tuesday classes
- November 26, Wednesday ..... Classes close 5:20 pm Thanksgiving recess
- December 1, Monday ..... Instruction resumes
- December 13, Saturday ..... Graduation, 10:00 am
- December 17, 18, 19, 22, 23, Wednesday-Friday, Monday-Tuesday ..... Final examinations
- December 30, Tuesday ..... Grades due in Registrar's Office not later than 5:00 pm

## 1987 Spring Semester

**(1 day registration, 72 class days, 5 exam days)**

- January 12, Monday ..... Registration
- January 13, Tuesday ..... Instruction begins
- January 27, Tuesday ..... Last day to add or drop a course and adjust final fees
- February 23, Friday ..... Last day to submit a graduation card for Spring 1987 graduates
- March 3, Tuesday ..... First half of semester ends
- March 6, Friday ..... Classes close 10:00 pm
- March 10, Tuesday ..... Deficiency reports due in Registrar's Office by 5:00 pm
- March 16, Monday ..... Instruction resumes
- March 27, Friday ..... Last day to drop a course
- April 16, Thursday ..... Classes close at 5:20 pm, Easter recess
- April 21, Tuesday ..... Instruction resumes; Monday classes
- May 2, Saturday ..... 101st Annual Commencement, 10:00 am
- May 4-8, Monday-Friday ..... Final examinations
- May 13, Wednesday ..... Grades due in Registrar's Office not later than 5:00 pm

## 1987 University Summer Session

- June 8, Monday — July 31, Friday ..... Eight week session
- June 8, Monday ..... Registration
- June 9, Tuesday ..... Instruction begins
- July 2, Thursday ..... Close of first 4 week session
- July 6, Monday ..... Registration for second 4 week session
- July 31, Friday ..... Close of instruction
- August 5, Wednesday ..... Grades due in Registrar's Office not later than 4:00 pm



South Dakota

SUNAWNE

General Information

---

---

# About South Dakota State University

---

## Purposes

---

In accepting the provision of the "Morrill Act" of Congress of 1862, the state of South Dakota, in 1889, "bound itself legally and morally to carry out the purposes for which the grants were intended." The purposes of this so-called Land-Grant College Act are:

... the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, to teach agricultural and mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.

Stated in terms of modern conditions,

but within the spirit of the "Morrill Act" and the early legislative acts of South Dakota, the purposes of SDSU are:

1. To provide professional education in the fields of agriculture; engineering; home economics; pharmacy; nursing; teacher education; basic physical, biological, and social sciences, and humanities on both undergraduate and graduate levels.
2. To provide citizenship training and general education essential for understanding and appreciation of the American way of life and its relation to the world community.

3. To promote student self-development in cooperation, leadership and other personal attributes.
4. To provide vocational or terminal education in agriculture, printing, and other areas.
5. To promote and conduct research in agriculture; engineering; home economics; pharmacy; nursing; teacher education; basic physical, biological, and social sciences, and humanities.
6. To promote and conduct extension educational programs for youth and adults in South Dakota.
7. To provide other services for the welfare of the state.

## Historical Sketch

---

**Establishment.** An act of the Territorial Legislature, approved February 21, 1881, provided that "an Agriculture College for the Territory of Dakota be established at Brookings."

The Legislature of 1883 provided for the first building.

The Enabling Act admitting the State of South Dakota, approved February 22, 1889, provided that 120,000 acres of land be granted for the use and support of the Agricultural College. By the Enabling Act of 1889 congress granted South Dakota 40,000 additional acres for the Agricultural College in lieu of a grant that had been made to new states in 1841.

In 1923 the Institution's Instructional program was organized under five divisions: Agriculture, Engineering, General Science, Home Economics and Pharmacy. In 1956 the sixth undergraduate division, Nursing, was created and in 1957 all graduate work was organized into a graduate division. The university organization was formally recognized when the legislature changed the name to "South Dakota State University" on July 1, 1964. At that time the following colleges were created: Agriculture and Biological Sciences, Arts and Science, Engineering, Home

Economics, Nursing and Pharmacy, as well as the Graduate School.

In 1974 the College of General Registration was established to provide assistance to students who are undecided as to major, are preprofessional, or who want a one or two year general personal studies program.

In 1975 the Division of Education was created to provide greater recognition of the part the university plays in preparation of teachers, counselors, and administrators for primary and secondary school systems and higher education.

**The Agricultural Experiment Station** was organized in 1887 under the Hatch Act of Congress, which provided for establishment of agricultural experiment stations in connection with agricultural colleges. The stations were established to conduct research that concerns the home or agriculture throughout the U.S. They also were to aid in information diffusing on these topics. The S.D. station's research primarily concerns: livestock, dairying, crops and soils, irrigation, horticulture, plant and animal diseases and pests, marketing and farm and ranch management, population studies, community and resource development,

human nutrition, textiles and clothing, home management.

**The Cooperative Extension Service** was established to provide useful, current agricultural and homemaking information to the people of the state. Federal funds are appropriated through the U.S. Department of Agriculture, which cooperates with state colleges of agriculture and counties in conducting planned programs of Extension work. In addition to a state staff of specialists, county offices are maintained throughout the state to provide information concerning agriculture, home and family, 4-H Club work, and the community.

**State and Federal Support.** Support from state funds is granted and controlled by the Legislature. The annual appropriation provides funds for salaries and other regular expenses. Special appropriations provide for buildings or other capital expenditures. The Legislature has also accepted at various times additional grants from the Federal government, some for instructional work, some for research, and some for extension work in agriculture and home economics. These are itemized in the annual financial report of the University.

# Organization

**The Board of Regents.** Control of the educational institutions of the state is vested in the Board of Regents.

**The Faculty.** Consists of the President, the Vice-Presidents, the Deans and other administrative officers, teachers and researchers with rank of instructor or above.

The faculty is responsible in general for academic standards and procedures, including recommendation to the Regents of candidates for degrees.

Faculty business is conducted by the Academic Senate, an elected body through which faculty express concerns for the wel-

fare of the University and the University community, develop and disseminate communications, contribute to formation of general University policy, and perform those duties and functions allocated to or assumed by the faculty.

## Board of Regents

*Honorable Dennis McFarland* (Term expires March 31, 1987).....Sioux Falls  
*Honorable Howard Owens* (Term expires March 31, 1987).....Sturgis  
*Honorable Kay Jorgenson* (Term expires March 31, 1989).....Spearfish  
*Honorable Marlin Scarborough* (Term expires March 31, 1989).....Hayes

*Honorable George E. Maas* (Term expires March 31, 1991).....Watertown  
*Honorable William J. Srstka, Jr.* (Term expires March 31, 1991).....Pierre  
*Honorable Michelle Tapken* (Term expires March 31, 1991).....Yankton  
*Honorable E. Steeves Smith* (Term expires March 31, 1991).....Mitchell

*Honorable Roger Prunty* (Term expires March 31, 1992).....Brookings  
*Linda Wagner*, Student Regent..... Pierre  
*Honorable Gordon Foster*, Executive Director..... Pierre

## General Administration

*Robert T. Wagner*, Ph.D., President  
*Paul E. Nordstrom*, Ph.D., Acting Vice President for Academic Affairs  
*James A. Fries*, Ph.D., Acting Vice President for Administration  
*Barbara Audley*, D.P.A., Director, Division of Lifelong Learning and Outreach

*Glen Carver*, Director of Physical Plant  
*Charles F. Cecil*, M.A., Assistant to the President  
*Dean Hofland*, Ed.D., Director of Admissions, and High School Relations  
*Ranny B. Knutson*, M.Ed., Registrar

*Leon Raney*, Ph.D., Dean of Libraries  
*Michael P. Reger*, Ph.D., Dean of Student Affairs  
*Wesley G. Tschetter*, MBA., Director of Finance and Budget

## Academic Deans

*Edna Page Anderson*, Ph.D., Acting Dean, College of Home Economics  
*Richard A. Battaglia*, Ph.D., Acting Dean, College of Agriculture and Biological Sciences  
*Ernest L. Buckley*, Ph.D., Dean, College of Engineering

*Rex Myers*, Ph.D., Dean, College of Arts and Science  
*Raymond Hopponen*, Ph.D., Dean, College of Pharmacy  
*Darrell Jensen*, Ph.D., Dean, Division of Education

*James O. Pedersen*, Ph.D., Dean, College of General Registration  
*Carol J. Peterson*, Ph.D., Dean, College of Nursing  
*Christopher P. Sword*, Ph.D., Dean, Graduate School; Director of Research

# Educational Objectives

The educational objective of SDSU is primarily to guide each student in attainment of intellectual and professional competence, growth of personal development, cultivation of a sense of social and civic responsibility, and achievement of a satisfactory adjustment in human relationships.

**Intellectual and professional competence is attained when a graduate:**

1. Has developed knowledge and skills—including those of clear oral and written expression and evaluative listening—required for beginning competence in a vocation or profession.
2. Has acquired those self-reliant character elements that demonstrate a high personal code of ethics and willingness to pursue vocational or professional objectives within a frame-

work of humanitarian and social goals.

3. Has developed the ability to think clearly and speculate imaginatively about both immediate and long-range problems.

**Adequate personal development has been achieved when a graduate:**

1. Attempts to reach sound, objective decisions after considering the values and practical and theoretical issues involved, and after exploring reliable sources of information, and then accepts responsibility for these decisions.
2. Has begun to evolve a meaningful personal philosophy of life based upon a growing knowledge of self, a perceptive awareness of the world, and a critical appraisal of his relationship to

this code.

**A satisfactory sense of social and civic responsibilities has been acquired when a graduate:**

1. Has critically examined the ideas of democratic society and their underlying assumptions, which embrace a belief in: the worth of the individual, the preservation of free inquiry, free discussion, equality of opportunity, and respect for law.
2. From this examination has applied conclusions to a citizen's role for which he/she keeps informed in attempts to play a constructive role in the dynamics of social change, and the evolving of social and civic values in which he or she believes.



A satisfactory adjustment in human relationships has been achieved when a graduate:

1. Respects the brotherhood of many by following the principle of doing to

others as he or she would have them do to him or her.

2. Supports the dignity of fellow human beings in his or her own and alien

cultures by respecting their social amenities, rights, abilities, and racial, religious and cultural attributes.

## Endowed Chairs

An endowed chair is a prestigious faculty position supported entirely by private contributions. Individuals appointed to serve in such positions will be renowned in their fields of expertise and will add a special dimension of quality to the academic environment at South Dakota State University.

An endowment fund established by Dr. Ethel Austin Martin, a 1916 SDSU graduate has, for a decade, maintained an ongoing program of visiting professorships in human nutrition and will eventually support in perpetuity an endowed chair to be entitled

the ETHEL AUSTIN MARTIN-EDWARD MOSS MARTIN CHAIR of HUMAN NUTRITION.

The Chair of Human Nutrition will be established at SDSU to ensure scholarly instruction in the broad aspects of the science of nutrition. This will be a continuing campus position with faculty rank filled by a nutrition scientist selected for qualifications in the science of nutrition, and for understanding, skill and experience in advancing the multidisciplinary approach to nutrition

education. This position will be funded solely by the endowment.

The Visiting Professorships will continue to be conducted periodically as a major multidisciplinary function of the Chair Program. Typically, visiting professorships are for a period of days or weeks.

Programs supported by the Ethel Austin Martin endowment have no administrative affiliation with any one college or department of SDSU. The endowment is administered directly under the Vice President for Academic Affairs.

## Objectives of the Research Program

The philosophy of the research efforts of SDSU is that of advancing knowledge basic to the teaching and extension programs. In addition, research should discover new ideas, processes and developments to expand and strengthen our industrial and agricultural economy.

The research program provides an atmosphere and encouragement for research and creative activity in all segments of the institution.

### Research Institutes

The University Research and Instructional Program is also carried on through four

institutional programs: Institute of Irrigation Technology, Institute of Social Sciences for Rural-Urban Research and Planning, Remote Sensing Institute, and Water Resources Institute. For further information, consult the director of the institute involved.

## The Agricultural Experiment Station

Raymond A. Moore, associate dean, Agriculture and Biological Sciences; director, Agricultural Experiment Station

The research function of the College of Agriculture and Biological Sciences results from carefully designed experiments providing a base of new knowledge for farmers and ranchers, homemakers, businessmen and professional workers.

This new knowledge is effectively used by farmers, ranchers, homemakers, by industry in the campus classroom and in extension education programs throughout the state. Courses in the College of Agriculture and Biological Sciences and in the College of Home Economics are especially strengthened by this new knowledge. State and area extension specialists in Agriculture and

Home Economics, plus counties have immediate access to this information for their educational efforts.

Most of the research is done at Brookings and is led by faculty who also teach undergraduate and graduate courses. Agricultural research and extension centers are the focal points of off-campus research efforts. These are at Rapid City, Redfield, and Beresford. In addition, several individual stations are maintained to conduct research designed to solve local or special purpose problems. In addition, several individual stations are maintained to conduct research designed to solve the problems of a local area. Beyond this, research on farms and ranches, in wildlife areas, in streams and reservoirs, and with cooperating businesses and institutions results in research being conducted in every county of the state.

Research may be grouped in the following subject matter areas; livestock, crops and soils, community and public affairs, animal health, fertilizers, garden and orchard, home and consumer, water resources and irrigation, forestry, insects, farm machinery, marketing, business management, farm buildings, pollution, range and grass, fisheries, plant diseases, wildlife, and sociology.

The research is financed by state appropriations, federal appropriations through USDA, industry grants, and federal and state grants. Research results are published in Experiment Station or Extension bulletins, journals of scientific societies, and a quarterly publication, Farm and Home Research. These publications are available from the County Extension Office or the Experiment Station Bulletin Room on campus.

## The Cooperative Extension Service

Richard A. Battaglia, acting dean, College of Agriculture and Biological Sciences; director, Cooperative Extension Service

This is the off-campus educational function of the College of Agriculture and Biological Sciences and the College of Home Economics.

The service extends the SDSU campus to every community and the advantages of higher education to all people. Through its extension agents, and supporting statewide

specialists the Cooperative Extension Service disseminates the findings of research and encourages the application of knowledge to solution of problems encountered in everyday living.

Much of the economic progress of farmers and ranchers can be traced to this unique type of non-formal out-of-school learning opportunity provided them for more than 70 years by SDSU in cooperation with the U.S. Department of Agriculture and county governments.

Forty-two percent of the funds supporting Cooperative Extension educational programs are appropriations to SDSU by the Legislature, 50 percent come from Federal appropriations and 8 percent from counties.

Extension program emphasis is constantly changing to meet the needs and opportunities of people who help determine its instructional needs. The following broad areas of educational program objectives describe the scope for this service:

1. To provide education that will increase net farm income through management practices that insure efficient production, marketing, and energy use techniques.
2. To improve family income utilization through sound resource management and nutrition education.
3. To provide educational opportunities to youth to learn about and practice our economic system and to develop individual leadership abilities.

4. To assist local leaders and citizens in the development of viable economic rural communities.

The Extension staff is dedicated to the task of assisting individuals and groups meet the challenge of change in farming, ranching, marketing, the home, state and nation. They use the press, radio, T.V., education publications and individual contacts to inform and teach. Resident students are encouraged to become acquainted with Extension staff members on campus and take advantage of the information available in Extension publications to enrich their regular course of study. Extension also offers rewarding career opportunities for college graduates in Agricultural and Home Economics, Natural Resources, and the Social Sciences.

## University Affiliations and Accreditations

---

The University holds institutional membership in a number of educational associations. The National Association of State Universities and Land-Grant Colleges promotes the aims expressed in the Morrill Act of 1862, and in the subsequent acts of Congress relating to Land-Grant Colleges.

The North Central Association of Colleges and Schools is the regional accrediting agency. Its purpose is to maintain high standards of instructional work and educational programs. The University is accredited through the doctoral level.

The Athletic Training Program is accredited by the National Athletic Trainers Association.

The departments of Agricultural, Civil, Electrical, and Mechanical Engineering are accredited by the Accreditation Board for Engineering and Technology.

The department of Nursing in the College of Nursing is accredited by the National League of Nursing.

The athletic training minor is accredited by the National Athletic Trainer Association.

The Chemistry department is accredited by the American Chemical Society. The coordinated undergraduate program in dietetics is accredited by the the American Home Economics Association.

The curriculum in Journalism is accredited by the American Council on Education for Journalism.

The Music Department has full membership in the National Association of Schools of Music.

Preparation of secondary teachers at

both the undergraduate and graduate level is accredited by the National Council for Accreditation of Teacher Education.

The curriculum in Pharmacy is accredited by the American Council on Pharmaceutical Education.

The University also holds membership in the American Council on Education, the National Education Association, the American Association of University Women, the American Association of Colleges of Pharmacy, the American Society for Engineering Education, the Association of Accredited Schools and Departments of Journalism, the American Library Association, Associated Western Universities, the National Commission on Accrediting Agencies, Council of Graduate Schools in the U.S. and several others which are concerned with more limited phases of college work.

---

## Admission Policies and Procedures

---

### Undergraduate Admission

---

Applicants are encouraged to apply for admission well in advance of the desired date of entrance, six to ten months before the semester of anticipated attendance. Early application allows sufficient time to arrange housing, to apply for financial assistance,

and to make arrangements to attend the new student pre-registration and orientation programs.

**All applicants must complete: (1) Admission application — Sub-**

mit application for admission with \$15 non-refundable fee. Payment should be made by check or money order. Those seeking readmission do not pay the \$15 application fee.

(2) **Housing application** — Students are required to live on-campus unless two or more years beyond high school graduation, married or living with an approved legal guardian. All applicants must complete the housing application when applying for admission. Enclose the \$50 advance housing deposit if applying for university housing.

(3) **Health application** — Upon admission to the university, all new applicants are required to submit a health examination form. This form will be sent to the applicant with the letter of admission. All applicants seeking readmission must submit a health examination form if nonattendance at SDSU exceeds one year.

**Applicants entering from a high school must also:** (1) Submit the results of the American College Test. These results must be sent from the test center in Iowa City. SDSU's ACT code is 3924. (2) Submit a high school transcript.

**Applicants transferring to SDSU must also:** Submit an original transcript from each college previously attended, plus a high school transcript.

**Applicants seeking readmission must also:** Submit transcripts from all colleges attended since enrolled at SDSU.

Application deadlines are August 1 for the fall semester and December 1 for the spring.

**International Students must apply earlier:** June 1 to be considered for fall admis-

sion, November 1 for spring admission. It should be noted that the university does not usually admit international students directly from their home countries for the spring semester. Notify the foreign student adviser for application procedures and forms.

The university reserves the right to defer admission to potentially eligible candidates to the next semester if credentials are submitted after established deadlines or enrollment quotas have been reached. Applicants whose materials are received after August 1 for fall and December 1 for spring may be denied or may be permitted to register as a late student.

The Admissions Office accepts admission packets and processes applications on a rolling basis. Address is: Admission Office, Administration 200, SDSU, Box 2201, Brookings, SD 57007. Phone: (605) 688-4121.

## Admission Requirements

Admission to SDSU is granted without regard to age, race, color, religion, sex, handicap, or national origin.

Admission to SDSU is open to all academically qualified students. If you are a high school student or recently graduated, your admission will be based on your high school class rank or if that is below the minimum requirement on your ACT composite score. Transfer students are considered for admission based on their cumulative grade point average.

### High School Students or Current Graduates

- (1) **High school degree or equivalent before enrollment as a full-time student is required.** (You can be considered for admission following completion of your junior year in high school.)
- (2) **Complete the American College Test.** (Applicants two or more years beyond high school are exempt from this requirement.) High school students are encouraged to complete the ACT late in their junior year or early in their senior year.
- (3) **South Dakota residents** — You will be admitted if you rank in the upper one-half of your high school class OR if you complete the ACT with a composite score of 21 or above.
- (4) **Reciprocity approved Minnesota residents** — You will be considered for admission under South Dakota resident admission requirements.
- (5) **Out-of-state students** — You will be admitted if you rank in the upper one-half of your high school class OR if you complete the ACT with a composite score of 22 or above.

(6) **Concurrent attendance of high school students** — limited attendance by juniors and seniors may be approved upon submission of transcripts, high school approval, and special application.

**Underqualified candidates** — Those who do not meet the above requirements should contact the Office of Admissions for special application details. Twenty-five underqualified students can be admitted each fall.

**Non-traditional Students** — over the age of 21 will be considered for admission on an individual basis.

**Two Year Program** — If you want to apply to the two (2) year program in General Agriculture or Printing, you must have an ACT composite standard score of 15 or above OR rank in the upper two-thirds (2/3) of your graduating class.

**Students entering for the fall of 1987 and subsequent semesters** — New students, including transfer students with less than 62 semester hours of credit, must meet the following minimum requirements for admission. (Transfer students must also meet the admission requirements as stated under 'Policy for Transfer of Undergraduate Credit' section.)

#### I. Regular Admission

Unconditional admission to South Dakota State University will be granted if you meet the following criteria:

- A. Have achieved a C average in the following required high school courses:
  - English — 4 years (One year of debate instruction may be included to meet this requirement.)
  - Mathematics — 2 years (Algebra, geometry, trigonometry, or other advanced math. Arithmetic, busi-

ness math and general math are not accepted.)

Laboratory Science — 2 years (Courses in biology, chemistry or physics in which at least one regular laboratory period is scheduled each week.)

Social Science — 3 years (History, economics, sociology, geography, government, etc.)

Computer Science — 1/2 year.

Fine Arts — 1/2 year. (Art or music appreciation, analysis or performance.)

- B. If you have taken these required high school courses but failed to achieve a C average, unconditional admission will be granted if you:
  - (1) Rank in the top one-half of your high school graduating class, or
  - (2) Have an ACT composite score of at least 21 if you are a South Dakota resident, 21 if you are a Minnesota resident, 22 if you are a non-resident, or
  - (3) Are selected for an opening in the University's exception group. These openings are limited and available to South Dakota and Minnesota residents only. You must have an ACT composite of at least 18 to be considered for admission under the exception policy. Early application is essential.
- C. Are 21 years of age and have graduated from high school or have completed the GED test and met state requirements for the high school equivalency certificate.

## II. Provisional Admission

Applicants who are deficient in one of the high school course areas outlined in Section I-A may be granted provisional admittance if they:

- (1) Rank in the top one-half of their high school graduating class, or
- (2) Have an ACT composite score of at least 21 if you are a South Dakota resident, 21 if you are a Minnesota resident, 22 if you are a non-resident, or
- (3) Are selected for an opening in the University's exception group. These openings are limited and available to South Dakota and Minnesota residents only. You must have an ACT composite of at least 18 to be considered for admission under the exception policy. Early application is essential.

If admitted on a provisional basis, you must satisfy the deficient course by completing an appropriate college course in that area. Credit can not be counted toward the total credits needed for graduation at SDSU. Basis: one year high school course = 3 credit hours.)

A deficient course must be satisfied within two years of admittance to SDSU.

## III. Admission to an Associate of Arts (two-year) Program

Admission to an Associate of Arts (two-year) program in General Agriculture or Printing is granted if you have met ONE of the following criteria:

- (1) Rank in the top two-thirds of your high school graduating class, or
- (2) Have an ACT composite score of at least 15.

Students enrolled in either two-year General Agriculture or Printing who have not met the minimum high school course requirements for a four-year baccalaureate program may be allowed to enter a baccalaureate program only after they have satisfied the deficiencies as outlined in Section II and attained an acceptable grade point average.

## Policy for Transfer of Undergraduate Credit

You are considered a transfer student if you have enrolled for any college level coursework, whether full-time or part-time, and are six (6) or more months beyond high

school graduation. If you are a transfer student who graduated from high school in 1987 or later, you must satisfy the high school course requirements unless you have completed 62 hours of college credit. If you have a course requirement deficiency you must complete equivalent college courses to remove that deficiency within two years. Credits taken to satisfy admission course requirements will not be counted toward graduation.

### Transfer students are eligible for admission if they meet the following:

- (1) Have a cumulative grade point average of C (2.0 on a 4.0 scale). Education, Engineering and Nursing major students must have a 2.5 GPA.
- (2) Are in good standing with their most recently attended school.

Students with less than a C (2.0) grade point average may be admitted on scholastic probation but each applicant is considered on his/her individual merits.

Students currently enrolled at another institution and seeking admission to SDSU can send incomplete transcripts (including all coursework completed thus far). The director of admissions may grant **provisional admission** status until complete transcripts are received.

Transfer credits are evaluated relative to university, college and major requirements. Questions should be directed to the appropriate college dean.

1. Academic courses completed for credit at institutions accredited by a regional accrediting association\* are acceptable for transfer if such courses are applicable to the student's degree program at the accepting institution. Credits from colleges or universities which are not accredited by a regional accrediting association may be accepted in transfer, subject to all other provisions of these guidelines and any conditions for validation which may be prescribed by SDSU. Course credits are acceptable for transfer if completed with a passing grade.
  - A. Academic courses will be transferred as meeting graduation requirements if the courses parallel requirements for the degree or if the courses meet electives required for the degree. Credit will not be given for duplication of courses.
  - B. Remedial courses, vocational courses, orientation, life experience, and high school level courses are not accepted for transfer credit. No transfer credit is granted for General Educational Development Tests. Where vocational courses are applicable to an individual's degree program, credit may be accepted upon the approval

of the dean of the college in which the student is enrolled.

- C. Credit earned for college level courses by examination, extension, correspondence, USAFI, etc. will be evaluated and accepted for transfer if equivalent to courses at and consistent with the policies of SDSU.
  - D. When a course has been repeated for credit, the last grade earned will be used in the evaluation of the acceptance of credit.
  - E. Transfer credit for work at a junior or community college (2 year) may not exceed one-half of the hours required for completion of the baccalaureate degree at SDSU. Students who have completed more than the acceptable semester hours of junior or community college work may apply completed, transferable courses to specific course requirements and thereby not be required to repeat the courses. The semester hours of credit for those additional courses may not be applied toward the minimum credit hours required for the degree.
2. Evaluations of courses will be made by the appropriate institutional officials at the time of admission by comparing descriptions of courses completed with those at SDSU.
  3. General educational requirements successfully completed at the sending institution within the South Dakota higher education system will be accepted towards meeting these requirements for SDSU.
  4. Transfer credits will be accepted with the same grade and credit as was recorded on the transcript from the institution at which the course was completed. Courses accepted in transfer from institutions with a different credit and/or grading system will be equitably converted to the SDSU system. Each institution may establish grade-point average requirements for graduation, honors, and academic standing based upon the work of the student at the receiving institution in addition to the cumulative credit and grade requirements. If a grade of F or the equivalent was received in a course otherwise transferable within this policy, the cumulative grade point average shall be calculated incorporating the "F" grade.
  5. The President or his designee is responsible for insuring that regental policy will be followed by those involved in determining what courses will be transferred to meet graduation requirements. Each institution shall develop and maintain a procedure for the appeal of transfer credit decisions.

\*North Central Association of Colleges and Schools, Western Association of Schools and Colleges, New England Association of Schools and Colleges, Northwest Association of Schools and Colleges, Middle States Association of Colleges and Schools, Southern Association of Colleges and Schools.

## Former Students

Previous SDSU students will be admitted upon review of all collegiate coursework. Petition process may be required if student has been placed on probation or refused status. Approval is required by the dean of appropriate college and the director of admissions. (See Academic Information section)

## Certificate or Examination

Those who wish to enter college but lack entrance credits or have not been graduated from an accredited high school may contact the Office of Admissions for information regarding entrance by certificate or examination. Any arrangement for admission by examination or certificate **MUST BE COMPLETED** at least 30 days prior to the date of intended registration.

## Special Students

Those who wish to enroll with a partial load or do not plan to work toward a degree may be classified as special students. Special students must generally meet the requirements outlined for admission of freshmen. Persons not eligible should contact the Office of Admissions in advance of the registration to permit consultation with the heads of departments and deans involved to determine eligibility for admission.

## Students With a Break in Education

Students who have had a break in their education should also complete the application for admission and forward that along with a high school transcript. Students more than two years beyond high school are not required to complete the ACT. If completed, the ACT is used only for advisement and placement into courses.

## Admission with Advanced Placement

The university recognizes that you may be qualified to enter college at a level above the average freshman. You can receive this recognition in several ways. See Examination for University Credit.

Those entering the university with advanced placement and credit are expected to

use their abilities to enrich their educational experience rather than shorten it. The final decision in granting advanced placement and credit rests with the head of the department in which the credit is sought.

## International Students

SDSU is dedicated to providing educational opportunities for international students and has more than 300 international students in attendance from more than 45 countries. To facilitate admission, you should complete a preliminary application, make arrangements to take the TOEFL (Test of English as a Foreign Language) and have results sent to SDSU.

Upon receipt of a preliminary information form and TOEFL results the International Student Adviser Office will contact you with further information and instructions.

To be admitted to SDSU you need to have a secondary school or college transfer grade point average of 2.5 for engineers or a 2.25 for other majors. Transfer students from other colleges in the U.S. must have completed at least 25 semester credits at a single college with the above grade point average. A TOEFL score of 500 is required, 550 is average, for both new and transfer students. A signed SDSU application form, a \$15 application fee, official academic records and financial certification are also required. While attending SDSU, international health insurance is required unless your sponsoring agency provides insurance which is equal to or better than the University policy. All students under 21 years old are advised to live in campus residence halls and those who have been out of high school less than two years are required to do so.

**English Placement.** If you are a new undergraduate student, you will be given the Michigan test. Placement in English will be determined by your test score as follows:

1. If you score less than 80 (equated score) on the Michigan test, you will be required to take English 003. If you obtain less than a C in English 003, you must repeat it. If you are placed in English 003, you are expected to complete the course the first semester of enrollment and should not enroll in more than 15 credits including English 003.
2. If you score from 80-89 on the Michigan test, you must take English 101 regardless of a similar course taken at another

higher education institution. If you are placed in English 101, you should complete the course the first or second semester of enrollment at SDSU.

3. If you score 90 and above on the Michigan test, you may be granted transfer credit in English 101 for a similar course taken at another higher education institution.
4. If you took an advanced composition course and scored 90 or above on the Michigan test, you would be allowed credit for either English 300 or English 303.

For further information, see the International Student Adviser.

SDSU regrets that it is unable to offer financial aid to international students. Applicants therefore should be in a position to pay all expenses.

Registration permits may be withheld until the \$2,500 deposit has been made.

You must present evidence of financial ability to assume the expense of your education.

International students are expected to maintain the same level of proficiency and attainment as other students enrolled in the university.

## Correspondence Credit

Although SDSU itself does not offer correspondence courses, it will grant credit for correspondence courses from other colleges under the following circumstances:

Limited credit for correspondence work may be applied toward a degree. Such credit will not be approved if the work is done while the student is enrolled in the university, unless arrangements have been made in advance with the dean of the college concerned. Maximum acceptable credit by correspondence may be limited by the dean of the college concerned.

A person not enrolled in this university who contemplates earning credit by correspondence to be applied toward a degree here should consult the dean of the college in advance concerning the acceptance of such credit.

## Definition and Clarification of Fees and Refunds

**Application Fee** — Non-refundable charge assessed all applicants for initial admission unless you have attended at South Dakota State University.

**University Student Fee** — A fee charged per semester to cover health, student union and other university services, such as: admission to plays, athletic events, athletic

facilities, and partially funded judging, music and forensic programs.

**Instructional Fee** — A fee per credit charged to replace expended supplies and materials, defray cost of maintenance, repair and replacement of equipment, testing and other instruction-related costs.

**Late Fee** — If you do not register and pay partial fees during the regular established registration and payment periods you will be assessed a late fee of \$10. If you fail to satisfy financial obligations when due, you will be withdrawn from the university.

**Special Expenses for Nursing Students** — Uniforms must be purchased by second

year nursing students. Estimated cost is \$55. Transportation must be provided by the student in Public Health Nursing. Students enrolled in nursing major courses are assessed two additional fees each semester when applicable: clinical fee \$80; malpractice insurance \$9.

**General Deposit** — If you carry 9 or more hours you must pay a \$35 general deposit. Charges for laboratory breakage, damage to equipment or facilities, damage or loss of military uniforms, library and vehicle fines or special service charges may be levied against this deposit. You will be required to replenish this deposit periodically (at the end of each semester) and you may be required to replenish it at any time the deposit balance falls below \$15. The unused portion of the deposit will be refunded to you by mail within 60 days following graduation or non-return to college.

**Indebtedness** — If you are indebted to the university and do not satisfy financial obligations when due, you may be denied admission or withdrawn after notice from the university and you will not be permitted to register or receive a transcript of grades until the indebtedness is paid. This applies to your indebtedness to the university for tuition, fees, required deposits and board, and not to student organizations.

## Tuition, Living and Other Expenses

All charges listed are subject to change pending Regents action

	Resident	Non-Resident
Tuition — undergraduate on-campus per semester credit	\$32.25	\$73.50
graduate on-campus per semester credit	\$48.50	\$94.00
Instructional/Administrative Services Fee per credit	7.50	
University Student Fee — per semester per credit, (limit 12)	8.20	
Board, per semester		
Plan 1	\$363.75	
Plan 2	\$416.25	
Plan 3	\$468.75	
Plan 4	\$521.25	
Plan 5	\$573.75	
Plan 6	\$689.25	
Resident Hall Rent, per semester (includes phone)		
All halls (double room)	\$372.00	
Single occupancy	\$500.00	
Books and supplies (estimate), per semester	\$250.00	

### TYPICAL EDUCATION EXPENSES (ONE SEMESTER) FULL TIME UNDERGRADUATE

Tuition — 16 credits	\$516.00	\$1,176.00
University Student Fee — health service, Union, Student Association, Instructional	\$218.40	
Books and supplies	\$250.00	
Board (average plan)	\$470.00	
Residence hall rent	\$372.00	
	\$1,826.40	\$2,486.40

### INITIAL PAYMENTS REQUIRED FOR NEWLY ENROLLING STUDENTS:

Application fee (nonrefundable)	\$15.00	\$15.00
Residence Hall Advance Payment (Part of room rent)	\$50.00	\$50.00
General Deposit (paid first semester, covers breakage, library fines, etc., and is refundable after graduation or withdrawal.)	\$35.00	\$35.00
First time international student charge		\$75.00

Registration day each student makes a partial payment of charges ranging from \$50 to \$1,050 dependent primarily on residency status and campus housing. Final fee payment will be made approximately four weeks later.

**NOTE:** for Minnesota-S.D. reciprocity agreement, contact the Admissions Office.

#### Residency Requirements

Qualifications for residency for tuition purposes may be obtained by writing the Registrar's office.

#### Refunds

An appeals process does exist for students or parents who feel that individual circumstances warrant exception from published refund policy. Contact the Registrar for information.

**Food Service and Room Rent Refunds** — A charge of 10 percent of the total semester's rent is made for each week or part of week. No refund made after tenth week.

**Financial Aids** — If you have received financial aid from the current term, money may be refunded or repaid based on a formula established by Federal Financial Aid regulations and university financial aid policy.

**Student's Association Fee** — The refund is determined by the association and sent directly to the student.



# Student Housing and Food Service

Assisted by a Central Administrative staff, Custodial and Maintenance staffs and Professional/para-professional hall staffs, the Director of Housing administers programs and facilities for all on-campus housing. Housing staff members will assist you with questions regarding nearly any area of the University. Complete information and policies are printed in Residence Hall Information/Calendar and Family Student Housing, booklets distributed with housing contracts. The Student Housing Office is located in Wecota 115. The telephone number is 605-688-5148.

**Residence Halls** — Residence Halls at SDSU are living/learning centers where students are challenged to develop as individuals, as well as to study and to meet other students. All unmarried students are required to enter into Residence Hall and Food Service Accommodation contracts with the University. Students who have completed four semesters of full time enrollment at an institution of post high school education or who are two or more years beyond graduation from high school are excused from these requirements. Release from the residence hall obligation must be requested in writing prior to June 30 for Fall Semester and November 30 for Spring Semester in order to avoid a monetary penalty. University residence hall facilities rent for \$774 - \$1030 per academic year. Usually, two students are assigned to each room. However, several rooms are available for rental as single rooms, generally by students not required to live on campus. Students who do not reside in on-campus facilities may seek off-campus housing assistance from the personnel of the Student Association Off-

Campus Housing Assistance Office. The Off-Campus Housing Assistance Office is located in USJ 101. The telephone number is 605-688-5916.

**Residence Hall Advanced Payment** — The Housing Application is activated when a \$50 Advance Housing Payment (AHP) is received. However, a housing contract is not offered until the applicant has been admitted to the University, and a housing assignment is not made until a housing contract has been signed and returned. The \$50 AHP will appear as a credit on the student's final fee slip. Any person whose written request for cancellation of the residency requirement is received in the Central Housing Office on or before June 30 (for Fall Semester) or November 30 (for Spring Semester), who is released from the residency requirement, will have the \$50 Advance Housing Payment refunded. Any person whose written notice of application or contract cancellation is received in the Central Housing Office on or before June 30 (for Fall Semester) or November 30 (for Spring Semester) will have the \$50 Advanced Housing Payment refunded. Any person whose application or contract is cancelled at their request after these dates will be assessed a monetary penalty.

**Family Student Housing** — 80 unfurnished, one-bedroom apartments and 8 unfurnished, two-bedroom apartments are available for rent on campus. Rent for the one-bedroom apartments ranges from \$155-\$187 per month. Rent for the two-bedroom apartments is \$210 per month. Each apartment includes a refrigerator, stove, and all utilities. Admission to the University and at least one dependent are required before a student can be placed on a waiting list or be

assigned. Contact Student Housing Office personnel for more information.

## Food Service

University Food Service, through the Director, five professional managers, and more than 70 full-time staff, is committed to providing a food service program at SDSU that is both economical and of the highest quality. SDSU's food service program utilizes an Electronic Access System (EAS) which is a computer-based, declining cash balance system, uniquely designed to help students manage their individual food service accounts. Resident students select the meal program which best meets their particular eating needs and assume responsibility (through EAS) to monitor their own food service accounts and plan their food purchases accordingly. Student expenditures are recorded on computerized cash registers and updated account balances are immediately available. EAS is in place at each campus dining facility. Students may use their EAS account at any campus dining facility during posted operation hours. Complete information about EAS, food service hours, costs, and discounts is printed in the University Food Service brochure distributed at registration. All SDSU students living in residence halls, except those students who are not required to live on campus but who reside in specified residence hall areas, are required to participate in University Food Service. Other students, faculty, and staff may voluntarily purchase a discounted food program at established rates either at registration or at the University Food Service office.

## Residency Requirements

Qualifications for residency for tuition purposes may be obtained by writing the Director of Admissions and Records.

## Refunds

An appeals process does exist for students or parents who feel that individual circumstances warrant exception from published refund policy. Contact the Registrar for information.

**Food Service and Room Rent Refunds** — A charge of 10 percent of the total semester's rent is made for each week or part of week. No refund made after tenth week.

**Financial Aids** — If you have received financial aid from the current term, money may be refunded or repaid based on a formula established by Federal Financial Aid regulations and university financial aid policy.

**Residence Hall Telephone Rent** — No refund is made of the telephone rent.

**Student's Association Fee** — The refund is determined by the association and sent directly to the student.

### Schedule of Refunds Complete Withdrawal FY1986

Student's Actual Attendance From First Day of Scheduled Classes	Percent of Tuition Fees to Be Charged
First Week.....	20%
Second Week.....	20%
Third Week.....	40%
Fourth Week.....	40%
Fifth Week.....	75%
Sixth Week.....	100%
The charge for residence halls is at the rate of 10% per week for the first ten (10) weeks—with no refund at all after the 10th week.	
Food Service refunds will be based on the unused portion of the fee at the time of the refund.	
<b>Summer Session Refund</b>	
First Week.....	50%

# Financial Assistance

## Financial Aids

**Financial Aids Application** — SDSU offers all Federal Title IV financial aid programs to eligible students. You must complete an approved financial aid application (ACT Family Financial Statement preferred) which will determine your financial need. Priority for funding is given to students who have completed their financial aid application prior to March 1. Applications processed after March 1 will receive their Pell Grant and Guaranteed Student Loan with the additional financial aid awarded subject to federal funding. You must reapply for financial aid every academic year. Also, financial aid transcripts are required for all postsecondary school transfer students.

Students must maintain satisfactory progress as defined by the SDSU Financial Aid Office and remain in academic good standing to receive financial aid. Please request a copy of the SDSU Financial Aid News for additional information on SDSU student financial aid.

### I. Scholarships

A special application must be returned to the Financial Aid Office by January 25th to be considered for general SDSU scholarships. More than 1,000 scholarships are awarded annually to SDSU students through most departments based on academic achievement and talent performance. Scholarship recipients are notified in April with limited supplemental scholarships awarded during the summer and the school year.

Some scholarships have special requirements. If you feel you might qualify in these special areas, please contact the person listed.

**World War I Veteran Descendants:** Direct descendants of an honorably discharged veteran of World War I are eligible to compete for the LaVerne Noyes Scholarship. This requires a special application form in addition to the regular application available from Financial Aid.

**Agriculture:** Associate Dean, College of Agriculture and Biological Sciences, SDSU.

**4-H:** County Agents or Program Leader, SDSU.

**Air Force ROTC:** Professor of Aerospace Studies, SDSU.

**Army ROTC:** Professor of Military Science, SDSU.

**Athletics:** Director of Athletics, SDSU.

**Future Homemakers of America:** State Supervisor, Home Economics Education, Kneip Building, Pierre, South Dakota 57501.

**Music:** Music Department, SDSU.

**State of South Dakota Veterans and War Orphans:** Veterans Service Office, SDSU.

**Theater:** Theatre Department, SDSU.

### II. State Incentive Grant

### III. Pell Grants

### IV. Supplemental Educational Opportunity Grants

### V. Health Profession Loans (Pharmacy)

### VI. National Direct Student Loans

### VII. Work Study Program

### VIII. Nursing Student Loans

### IX. Guaranteed Student Loan

### X. Auxilliary (Plus) Loan

### XI. Student Employment

### XII. Veterans Assistance

SDSU is fully accredited for GI Bill educational assistance for qualified veterans.

### XIII. Serviceman's Opportunity College (SOC)

South Dakota State University has been designated as an institutional member of Servicemembers Opportunity Colleges (SOC), a group of over 400 colleges and universities providing voluntary postsecondary education to members of the military throughout the world. As a SOC member, SDSU recognizes the unique nature of the military lifestyle and has committed itself to easing the transfer of relevant course credits, providing flexible academic residency requirements, and crediting learning from appropriate military training and experiences. Servicemembers Opportunity College has been developed jointly by educational representatives of each of the Armed Services, the Office of the Secretary of Defense and a consortium of thirteen leading national higher education associations; it is sponsored by the American Association of State Colleges and Universities (AASCU) and the American Association of Community and Junior Colleges (AACJC).

### XIV. Aid to Members of S.D. National Guard

SDSU is approved for processing a student financial assistance program for eligible National Guard students. The application and certification is initiated by the guard through their Unit Commander. If you have any questions concerning this program, please contact the Veterans Service office.





---

---

# Academic Information

---

## Credits

---

Semester credit hours ("credits") are the numerical values assigned to hours of academic work, according to the amount of time required for lecture or laboratory. Normally one credit is equivalent to one hour of

class recitation and two hours of outside preparation per week for one semester.

Three hours of laboratory work, where no outside preparation is required, or two hours

of laboratory where outside activity is required is assigned one credit hour.

Independent courses vary in credit according to the nature of the work involved.

## The Bachelor's Degree

---

The Bachelor's degree is offered in more than 200 major fields or options in six colleges providing over 1700 individual classes specializing and preparing students for countless career opportunities.

## Graduation Requirements

---

Graduation requirements, leading to the various baccalaureate degrees, are designed to fulfill the educational objectives of the university toward:

1. Intellectual and professional competence,
2. Adequate personal development,
3. A sense of social and civic responsibility,
4. A satisfactory adjustment in human relationships,

The adviser system assists in proper course selection to meet curricular requirements and helps you avoid errors in scheduling. However, you have the final responsibility for satisfying the degree requirements for the curriculum chosen and the university core curriculum.

### University Assessment Program

The Board of Regents have authorized the collection of data to evaluate the educational process of institutions of higher education in South Dakota. This program is designed to measure the effectiveness of the basic core curriculum, satisfaction of students with their educational programs and the cognitive knowledge accumulated in the major programs of study.

The evaluation of programs will require that students be assessed at various stages of their program of study. Baseline Data will be collected at the freshman level and reassessment will occur at the Sophomore level. Seniors will take terminal examinations in their major where these tests exist. In order

to collect the most useful data you will be required to participate as part of your graduation requirement at SDSU.

Data collected from this program will be used to evaluate and adjust academic curriculum and other educational experiences in order to provide the students at SDSU with the best possible education.

**Note: No given course may satisfy more than one of these requirements, unless the minimum number of credits is exceeded. Credits in excess of the minimum credits needed may be applied in another area.**

### A. The General Degree Requirements

1. Completion of at least **128 semester credit hours** (see individual professional college requirements).

2. A ratio of at least two grade points per credit hour for courses passed. (Graduation ratio of 2.0). In computing the graduation ratio, all courses for which a grade of A, B, C, D, or E has been earned are used. Students who transfer from another institution must earn a minimum graduation ratio of 2.0 for the courses taken at South Dakota State University. If a course is repeated, only the last grade received will be computed in calculation of the graduation ratio.

3. **Resident requirement.** Successful completion of at least 32 hours at South Dakota State University with a minimum of 20 credit hours of junior and senior (300-

400) level courses. (For the two-year Associate Arts degree programs, successful completion of at least 16 hours at South Dakota State University is required.)

4. Completion of all college and major field requirements.

### B. Physical Education

Satisfactory completion of two semesters of PE 100, Fitness and Lifetime Activities (no activities may be repeated - note that taking a combined activity course such as 'Tennis and Basketball' and then taking 'Tennis and Archery' would be considered a repeat) for those entering South Dakota State University as freshman (less than 30 credits). Military service does not fulfill this requirement. Two additional one-credit PE 100 courses may be elected and such credit will count toward graduation.

### C. The Communications Requirement

1. **The written communication requirement:** You must complete 6 credits in English, English 101 the freshman year, and English 300 (for Engineering students, English 300 or 303) for the junior year.

You may exempt English 101, Freshman Composition by 1) Presenting evidence (in the form of a notation on the transcript or letter filed with the Registrar) of prior exemption from an accredited institution, or 2) an acceptable score in the subject CLEP test in English composition. Students must complete English 101 prior to or during the semester in which they complete 30 semester

credits toward graduation. Students will not be considered to have achieved sophomore standing until they have successfully completed English 101.

**2. The oral communication requirement:** You must obtain satisfactory proficiency in oral communication by completing SpCm 101, Fundamentals of Speech, or by taking an advanced course approved by the Head of the Speech Department.

Students must complete Speech 101 prior to or during the semester in which they complete 62 semester credits toward graduation. Students will not be considered to have achieved junior standing until they have successfully completed Speech 101.

#### D. Mathematics Requirement

Satisfactory completion of three credit hours of college mathematics.

#### E. Liberal Studies Core Requirement

To give an intellectual perspective of life's meaning, the faculty has established a core requirement in liberal studies. These courses will provide a foundation in broad areas of general education. Also, they will provide an access to fields of study from which you may choose a major field. These courses can also provide a competent background for building a career in the professional curricula.

#### Area I, Understanding the Great Ideas

Satisfactory completion of 6-11 semester hours† of humanities and fine arts with the required hours from at least two disciplines. At least three credits must be taken from the Humanities Section.

The humanities are broadly defined as courses concerned with the understanding and expression of man's ideas, creative processes and critical human encounters. To encourage and facilitate selection of courses from all aspects, the approved courses are listed in two groups. Those in Humanities deal primarily with ideas and attitudes expressed in words, while those in Fine Arts deal primarily with thoughts and feelings expressed through the arts.

†A combined total number of 28 semester hours must be taken in Humanities (a minimum of 6 semester hours) and Natural Sciences (a minimum of 8 semester hours) and Social Sciences (a minimum of 9 semester hours) to satisfactorily meet the Liberal Studies Core Requirement.

#### Humanities

##### Art History

- 100 Art and Design Appreciation
- 211 Survey of World Art and Architecture
- 212 Western Traditions in Art and Architecture
- 310 History of U.S. Art and Architecture
- 412 Studies in Modern or Contemporary Art and Design

##### Biology

- 383 Bioethics

##### Dance

- 340 History and Theory of Dance

#### English

- 213 World Literature through the Renaissance
- 215 Modern World Literature
- 218 Introduction to Literature
- 256 Literature of the American West
- 263 Poetry
- 265 Fiction
- 267 Drama
- 321 English Literature
- 322 English Literature
- 341 American Literature
- 342 American Literature
- 367 American Short Story
- 433 Shakespeare

#### European Studies

- 300 Topics in European Culture

#### Foreign Languages

- Foreign Languages
- 134 Foreign Cultures

#### French

- 101 Introduction to French Language and Culture
- 102 Introduction to French Language and Culture
- 201 Language and Culture of France
- 202 Language and Culture of France

#### German

- 101 First Year German
- 102 First Year German
- 201 Second Year German
- 202 Second Year German

#### Spanish

- 101 First Year Spanish
- 102 First Year Spanish
- 201 Second Year Spanish
- 202 Second Year Spanish

#### History

- 121 History of World Civilization to 1650
- 122 History of World Civilization since 1650
- 322 Ancient History

#### Honors

- 301 Honors Colloquium
- 302 Honors Colloquium

#### Humanities

- 213 Women in American Culture
- 215 Ethnic Literature

#### Latin American Area Studies

- 301 Latin American Cultures

#### Music

- 100 Music Appreciation
- 300 Blues, Jazz and Rock Survey

#### Music Literature

- 130 Music Literature and History I
- 131 Music Literature and History II
- 230 Music Literature and History III
- 231 Music Literature and History IV

#### Nutrition and Food Science

- 111 Food and Man

#### Philosophy

- 205 Introduction to Philosophy

- 215 Introduction to Social/Political Philosophy
- 225 Introduction to Ethics
- 235 Elementary Logic
- 312 Great Ideas of the Western World
- 331 Philosophy of Science

#### Religion

- 213 Introduction to Religion
- 226 Old Testament
- 227 New Testament
- 237 Religion in America
- 338 World Religions

#### Speech

- 260 Introduction to Film
- 330 Oral Interpretation
- 460 Film Narrative

#### Theater

- 100 Introduction to Theatre

#### Fine Arts

##### Art

##### Art Design

- 112 Lettering

##### Art Studio

- 112 Drawing I
- 122 Design Fundamentals
- 123 Three Dimensional Design
- 211 Drawing III
- 231 Painting
- 241 Sculpture
- 253 Ceramics
- 270 Textile Design
- 281 Printmaking

##### Dance

- 130 Fundamental Dance and Rhythms
- 132 International Folk Dance
- 230 Modern Dance I
- 231 Modern Dance II
- 240 Dance Composition
- 330 Dance Forms

##### Music

- 100 Instruction in Voice
- 110 Instruction in Keyboard
- 120 Instruction in Woodwinds
- 130 Instruction in Brass
- 140 Instruction in Percussion
- 150 Instruction in Strings

##### Ensembles

- 100 University Chorus/Pasquettes
- 101 Concert Choir
- 102 Statesmen
- 110 Civic University Orchestra
- 120 Marching Band
- 121 Symphonic Band
- 122 Concert Band
- 180 Jazz Ensembles

##### Theater

- 131 Acting
- 141 Stagecraft

#### Area II, Understanding our Physical and Biological Environment

Satisfactory completion of 8-13 semester hours† of natural science. This must include two courses in sequence from the

courses listed as "sequence courses" below and any other additional credits from any course listed below in the biological and physical sections so as to equal from 8-13 credits.

**SEQUENCE COURSES** (Must take one combination of courses in sequence) Biol 151 & 153; Biol 151 & Bot 200; Biol 151 & Bot 201; Biol 151 & Zoo 203; Chem 110 & 111; Chem 110 & 120; Chem 111 & 120; Chem 112 & 114; Chem 112 & 120; Geog 131 & 132; Phys 111 & 113; Phys 211 & 213.

### Natural Sciences

The natural sciences include mathematics and the biological and physical sciences that deal with matter, energy, and their interrelationships and transformations.

\*A combined total number of 28 semester hours must be taken in Humanities (a minimum of 6 semester hours) and Natural Sciences (a minimum of 8 semester hours) and Social Sciences (a minimum of 9 semester hours) to satisfactorily meet the Liberal Studies Core Requirement.

### Biological Sciences

#### Biology

- 151 Introductory Biology
- 153 Introductory Biology

#### Botany

- 200 Botany: Structure and Function
- 201 Plant Kingdom

#### Entomology

- 305 General Entomology

#### Forestry

- 232 Forest Ecology

#### Microbiology

- 231 General Microbiology

#### Nutrition and Food Science

- 221 Survey of Nutrition

#### Wildlife & Fisheries Sciences

- 210 Environmental Conservation

#### Zoology

- 123 Survey of Anatomy and Physiology
- 203 Animal Kingdom

### Physical Sciences

#### Chemistry

- 110 General Chemistry
- 111 Introductory Organic & Biochemistry
- 112 General Chemistry

- 114 General Chemistry
- 115 General Chemistry Lab
- 120 Elementary Organic Chemistry

#### Geography

- 131 Physical Geography I
- 132 Physical Geography II

#### Honors

- 304 Honors Colloquium

#### Mathematics

- 111 Algebra
- 113 College Algebra and Trigonometry
- 120 Plane Trigonometry
- 143 Finite Mathematics
- 123 Mathematical Analysis I
- 224 Mathematical Analysis II
- 225 Mathematical Analysis III
- 222 Calculus for Non-Math Majors

#### Physics

- 101 Introductory Physics
- 103 Descriptive Astronomy
- 111 Elementary Physics I
- 113 Elementary Physics II
- 211 General Physics I
- 213 General Physics II

#### Plant Science

- 113 Soils
- 243 Geology

### Area III, Understanding our Social Environment

Satisfactory completion of 9-14 semester hours\* of social science from at least two disciplines.

#### Social Sciences

The social sciences are among those courses that broaden your perspectives concerning your own identity, your participation as members of society, your understanding of human interrelationships, and your comprehension of public issues.

\*A combined total number of 28 semester hours must be taken in Humanities (a minimum of 6 semester hours) and Natural Sciences (a minimum of 8 semester hours) and Social Sciences (a minimum of 9 semester hours) to satisfactorily meet the Liberal Studies Core Requirements.

#### Anthropology

- 202 General Anthropology
- 320 Cultural Anthropology
- 321 High Cultures of Central and South America
- 421 Indians of North America

#### Child Development and Family Relations

- 141 Individual and the Family

- 211 Human Development and Personality I: Childhood
- 312 Human Development and Personality II: Adolescence
- 313 Human Development and Personality III: The Middle and Later Years

#### Economics

- 201 Macroeconomics Principles
- 202 Microeconomics Principles
- 301 Intermediate Microeconomics
- 302 Intermediate Macroeconomics

#### European Studies

- 301 Topics in European Society

#### General Engineering

- 231 Technology and Society

#### Geography

- 200 Introduction to Human Geography
- 210 World Regional Geography
- 212 Geography of North America
- 219 Geography of South Dakota
- 351 Economic Geography

#### History

- 251-252 American History Survey
- 368 History of American Indians

#### Home Economics

- 391 Consumers and the Market

#### Honors

- 303 Honors Colloquium

#### Political Science

- 100 American Government
- 101 American Government Honors
- 102 American Political Issues
- 210 State and Local Government
- 253 Current World Problems
- 265 Political Ideologies

#### Psychology

- 101 General Psychology
- 102 Introduction to Psychology
- 202 Advanced General Psychology
- 321 Child Psychology
- 362 Theories of Personality
- 451 Abnormal Behavior

#### Sociology

- 100 Introduction to Sociology
- 150 Social Problems
- 240 Rural Sociology
- 250 Marriage
- 340 Urban Sociology

## College and Major Field Requirements

Completion of courses outlined under the college and major field curricula to the satisfaction of the head of the major department and college dean. Regular full-time students in continuous attendance have the right to

graduate under the catalog curriculum in effect when they entered; however, necessary substitutions and additional courses may be required to meet the standards of the major field at the time of graduation.

Students who interrupt their college education for more than one year re-enter under the new catalog.

## Student Responsibility

---

Each student is responsible for satisfying requirements for graduation as listed under over-all university, college and major field requirements. This shall include notifying

the Registrar's Office in event any course, other than failed course, is repeated. If a student has questions concerning the proper

satisfaction of specific requirements he or she should consult with the dean, major adviser or the registrar.

## Foreign Language Policy

---

Entering students with appropriate backgrounds are permitted to sit for placement examinations, and are placed according to the results of such examinations. Credit will be granted for the exempted portion of the course sequence only if the student completes successfully at least one semester in

the language concerned at SDSU. The same course may not be used to meet both the humanities and the foreign language requirement for the B.A. degree.

**Credit for language proficiency.** If the particular language involved is not a student's native language and is not taught at

SDSU, elective credit may be granted if proficiency can be documented through transcript submission. No humanities credit will be granted for any level of proficiency in a native language.

## Class Attendance Policy

---

1. Class attendance requirements will be established by each instructor and specified in writing at the beginning of the term.

2. Regular class attendance is the responsibility of all students.

3. The faculty will honor absences approved by university officials where individuals

or groups are absent in the interest of the university.

## Registration

---

Each student is advised by a member of the faculty. Classes consistent with your plan of study and properly adjusted as to the amount of work are arranged by the adviser and subject to the approval by the dean.

The normal rate of progress is 16 credits each semester. To be a full-time student, undergraduates must carry 12 semester

credits. (Nine semester credits is considered full-time for graduate students.) Undergraduates will not be permitted to register in more than 20 semester credits the first term. Registration in more than 20 semester credits in subsequent terms is permitted only when the previous semester's work shows high achievement.

All overloads in excess of 20 credit hours must be approved by the dean of the college. In general, subjects will not be given to fewer than 10 students unless there is some special reason for doing so. Instructors will abolish classes only with the approval of the dean of the college concerned.

## University Withdrawals

---

Those finding it necessary to withdraw from the university are urged to consult with a faculty adviser to work out the best vocational plan possible. You must contact Student Affairs, Administration Building. Those who leave the university without obtaining

an official withdrawal will be reported as having failed the semester's work. Refunds are made only on the basis of the date of official withdrawal (see page of this catalog). The last date to withdraw from this

university is two weeks (14 days) before the end of the semester. After that date you may officially withdraw only with the permission of the Vice-President for Academic Affairs.

## Trip Regulations

---

A) Students involved in trips related to **university-sponsored instructional activities** as defined in the catalog under Purposes of the University or **university-affiliated activities** as scheduled by the Director of Student Activities or the Director of Housing must receive clearance. Permit forms are available from the Office of the Vice President for Academic Affairs and must be signed by the faculty sponsor and approved

by the dean of the college or his/her designate, or the Director of Student Activities or his/her designate and returned to the Office of the Vice President for Academic Affairs prior to the trip.

B) Students on university-approved trips are covered by accident-medical insurance. State-owned vehicles may be utilized if criteria established in the policy regulating use of state-owned vehicles are met. Drivers of per-

sonal vehicles should have liability insurance.

C) Students are eligible for trips if (1) activities of the student have not been curtailed by action of an authorized university judicial body; (2) no single trip shall keep students away from classes more than 5 consecutive class days.

D) The faculty will honor trip absences approved by university officials where individuals or groups are absent in the interest of

the university. Differences encountered between student and instructor will be arbitrated by the Vice President for Academic Affairs.

E) A Trip Absence Card for each student involved in the trip will be issued to the faculty sponsor upon approval of the trip. The Trip Absence Card will be signed by the faculty sponsor and given to each student.

The student should show the card to his/her instructors in making arrangements to make up any work missed because of a trip, previous to going on the trip. The student should retain the Trip Absence Card until after final grades are received by the student.

F) For insurance purposes, all intradepartmental trips (i.e. laboratory field trips, clinical experiences, etc.) that do not

involve the missing of classes by the participating students shall be cleared through the department office or the college dean's office, and a record kept of the number of students going and the dates of the trips. This record shall be summarized by each college dean and reported to the Vice President for Academic Affairs at the end of each academic term.

## Non-Degree Courses

---

In addition to courses leading to degrees, the university offers special and short courses in several lines of work. Consult the department head involved or the director of the Division of Lifelong Learning and Outreach.

## Auditing a Course

---

Registration as an auditor in a course may be permitted. No credits are given. The audit fee is the established tuition rate. After one year of full-time employment, full-time employees will not be charged tuition or general university/activity and instructional fees to audit a course. Other special fees are assessed to auditors. Fellows, graduate assistants, research and teaching assistants will

not be charged tuition to audit a course, but will be assessed general university/activity and instructional fees.

Auditing courses by graduate and undergraduate students must be a matter of record. **Registration for audit will be accomplished only after registration day by add slip procedure.** A report of Satisfactory (E)

and Unsatisfactory (F) will be given in each course audited, the basis for the grade to be agreed upon by the instructor and the auditor. Audit courses are counted as part of 20 hour rule for overloads except where prohibited by organization regulations. Audit courses are **not** counted in calculating undergraduate or graduate full-time status.

## Elective Work

---

Electives are offered so students may develop special talents or interests. The choice of subjects is left to the student, provided the selections made are consistent with the academic standards of the university. Electives used to meet the humanities,

social science and natural science degree requirements must be chosen from the approved list.

The dean of the college in which the degree is sought must approve registration

in an elective if the subject is counted toward the degree.

Elective courses are offered upon sufficient demand.

## Drop-Add Procedure

---

1. Approval for dropping or adding courses is initiated with your faculty adviser, and taken to Registrar's Office, 208 Ad, for official recording.

2. Courses may be added and crosslisted course prefixes changed during the first two weeks each semester.

3. Courses may be dropped without charge during the first two weeks. Drops after that date are not entitled to refund. **Grades for dropped courses:** a) You may drop a course with no permanent record

being made until two weeks after mid-semester grades are due. b) You may not drop a course after two weeks following midterm.

4. If extenuating circumstances (i.e. illness) have prevented class participation, your faculty adviser may refer you to the appropriate dean who, after consultation with the adviser and instructor(s) concerned, may designate an appropriate grade after the normal period to the Vice President for Academic Affairs.

You should not drop out of a class without processing discontinuance via the drop procedure. An "F" will be recorded for unofficial drop.

When an instructor deems it advisable for you to drop from class, a report is made to the dean. Your name should not be removed from the class roll until instructions to do so are given by the Registrar's Office.

**Veterans:** See Veterans Affairs under Campus Services to Assist the University Community.

## Intercollege Transfer

---

To transfer from one college to another within the university, you need an "Inter College Transfer" from the Career-Academic Planning Center located in Medary Commons.

# Grading System

The grading system is based on achievement in comparison with other members of your class.

A grade report is distributed to each registered student each term and a cumulative record is maintained in the Registrar's Office.

The quality of work is indicated by the following marks:

A — Exceptional — 4.0 grade points; B — Superior — 3.0; C — Average — 2.0; D — Passing (lowest passing mark) — 1.0; E — Satisfactory — 2.0; (not counted in GPA); F — Failure. (You must repeat the subject in a regular class to get a passing mark. Repeating the course will not remove the failure from your permanent record). G — Withdrawal with no grade; H — Withdrawal with failure; X — Grade not reported by instructor. Value same as "F" until removed. I — Incomplete, is a report indicating if for reasons beyond the student's control, a student cannot finish the required work in a course, and the work completed is of passing grade, the student may apply to the instructor for an Incomplete grade. If the instructor accepts this application, the student and the instructor must agree on a plan to complete the work of the course. The plan must be in writing and have a completion date of not more than one year from the end of the regular course. At the end of the plan or the one-year period, whichever is sooner, the instructor may assign any academic grade, from "F" to "A". Any incomplete not properly removed within one year will remain on the permanent record as an "I". A grade of

"I" is not counted in computing the grade point average.

With the exception of a year old "I", any grade reported to the Registrar may be changed by recommendation of the instructor and college dean and approval of the Vice President for Academic Affairs.

**Grade Points and GPA:** Grade points are related to grades in this way:

Military, 1 credit; grade A; grade points 4. Mathematics, 5 credits; grade B; grade points 15.

Chemistry, 4 credits; grade C; grade points 8.

French, 4 credits; grade C; grade points 8.

English, 3 credits; grade D; grade points 3.

Total credits — 17; total grade points — 38.

$GPA = 38 \text{ divided by } 17 = 2.235$

The cumulative grade point average is obtained by dividing grade points by the number of hours attempted. In computing grade point averages all hours attempted (i.e., graded A,B,C,D,X,F or H) are included even though, because of repetition of work some of them may be considered cancelled. Note: This excludes E and I grades.

**Repeating a Course to Raise the Grade.** If you repeat any course, the new grade replaces the former grade in computing the graduation ratio, but both will remain on your record and count in the cumulative grade point average. You must notify the Registrar's Office when a non-fail course is repeated. Credits and grade points earned for the

old grade cannot be counted toward graduation.

**Pass-Fail System.** The primary objective of the Pass/Fail System is to encourage students to attempt courses in areas they would normally avoid because of lack of background.

1. You may enroll in up to 20 credits.
2. These credits must be outside your major and may not serve to satisfy university, college or departmental specific course requirements.
3. Colleges may further restrict the Pass/Fail credit option.
4. A "D" letter grade or better is considered to be a passing grade in a pass/fail elective.
5. Registration for pass-fail electives will be accomplished only after registration day by informing the Registrar's Office. The pass/fail option should be known only to the academic adviser, the student and the registrar.
6. You may change from pass/fail elective to credit or vice versa only during the two week add period.
7. The grade (satisfactory/F) will be recorded on your permanent record, but will not count in the computation of the semester or the cumulative grade point average. If the course is passed (grade of D or better), the credits and the grade points computed as two times the number of credits will be counted for the graduation ratio.

## Academic Performance Requirements

The normal progress rate toward graduation requires 16 semester credits and 32 grade points each semester. To be in good scholastic standing you must maintain the following minimum semester performance: Freshman — a 1.5 grade point average; Sophomore — 1.7 grade point average; Junior — a 1.8 grade point average; Senior — a 1.9 grade point average; Special Students — 2.0 GPA.

If you do not maintain the above average, your scholastic status will be affected as follows:

**A. Probation** — At the end of the first semester in which you do not meet the requirements, you will be placed on "scholastic probation." Consultation with your academic adviser is recommended. Actions such as curtailment of participation on faculty-student committees may be appropriate. The dean may require you to carry a reduced load for the next semester.

**B. Refused** — You will be "refused" upon failure to meet requirements at the end of the probationary semester. Readmission may be possible on a "scholastic probation" status, upon application for readmission, after one semester of nonattendance. If you have been

on a refused status twice, you will not ordinarily be permitted to reenroll.

**Note:** Summer school will not count in the plan but you may remove a probationary status through summer school work by raising the grade point average of combined spring and summer work. A refused readmission status cannot be removed by summer school.

**C.** To appeal a refused status, you must do so to the dean of your college.

**D.** "X" grades will be counted as failures in figuring the grade point averages until removed. It is your responsibility to remove the "X" and check with the Registrar's Office to insure clearance of the record.

## Examination for University Credit

If you have studied a subject independently or have done work of college level for which you are unable to get a transcript acceptable to this institution, you may take a

special examination to establish credit under the conditions specified below:

1. Consult the head of the department concerned who will conduct a preliminary

survey of the work in which you claim to be prepared, and determine if an examination is warranted, what topics it should cover and what credit may be expected. Laboratory

courses or mixed lecture-laboratory courses must have the consent of the instructor in addition.

2. Consult the dean of the college in which you expect to receive a degree to determine whether credits by examination in the proposed subject will be acceptable toward the degree.

3. A fee established by the Regents must be paid before taking the examination.

4. If credit is accepted by examination the permanent record will show: course name — credit by examination, with an E grade for (a) credits. Course equivalent credit (a) and two grade points per credit will be allowed toward graduation. No entry will be

made on the record if the examination is failed. The examination results will not be figured in calculation of either the semester or the cumulative grade point averages.

5. No more than 34 credits obtained by examination for credit may be applied toward the Bachelor's degree.

6. Specific details are enumerated on an application form which must be filed by you to take such an examination. Copies of this form may be obtained from the Registrar.

7. Students who are not currently enrolled but who were previously in good standing, may acquire credit by examination providing they meet the above conditions.

8. Credit may also be received in certain subjects through the College Level Examination Program (CLEP), the Proficiency Examination Program (PEP), the Advanced Placement Program (APP) or through local standardized tests in Foreign Language and Mathematics. A fee is charged for administration of the CLEP, PEP, and APP tests. For information about credit through any of these programs contact the Testing office in room 315 in the Administration building.

9. However, a grade given at or transferred to this university may not be raised by examination for university credit.

## Class Rank

1. Sophomore rank requires 30 semester credits toward graduation.
2. Junior rank requires 62 semester credits toward graduation.
3. Senior rank requires 95 semester credits toward graduation.

## Graduation Honors

1. To be eligible for honors, a Bachelor's Degree student must have 60 earned semester hours in residence.

2. Students who transfer shall receive full value toward honors for grades and credits transferred, provided the institutions are fully accredited.

3. Honors shall be awarded on the basis of grade point average.

4. Honors will be based on all grades. The spring commencement program will include a listing of candidates for honors. However, final determination is made after all grades are included.

Honors shall be of three degrees:

With Highest Honor — grade point average 3.80 or above.

With High Honor — gradepoint average 3.60 to 3.799.

With Honor — grade point average 3.4 to 3.599.

5. Honor students shall have the appropriate honors inscribed on the diploma.

## Available Majors, Minors and Options

PROGRAM OF STUDY	COLLEGE ADMINISTERING	PAGE NOS.		
Aerospace Studies (minor)	A&S	55-56	•Child and Family Services	48,73
Agricultural Business (B.S.)	ABS/Ag	80-81	•Child Hospital Services	48,73
•Agricultural Finance Specialization			•Cooperative Program with BHSC & DSC	48,73
Agricultural Economics (B.S.)	ABS/Ag	81	•Early Childhood Education	48,72
Agricultural Education (B.S., M.Ed.)	ABS/Ag	30,85-86	•Family & Youth Organizations	48,73
Agricultural Engineering (B.S., M.S.)	ENGR	42,56-58	•Religious Services	48,73
•Electric Power and Processing		42,57	•Social Services	48,73
•Environmental Management		42,57	Civil Engineering (B.S.)	ENGR 42,74-77
•Power and Machinery		42,57	•Foundations Engineering	42,75
•Structures and Environment		42,57	•Highway Engineering	42,75
•Water Resources Engineering		42,57	•Hydraulics Engineering	42,75
Agricultural Extension (B.S.)	ABS/Ag	30,58-59	•Sanitary Engineering	42,75
Agricultural Journalism (B.S.)	ABS/Ag	30,121,122-123	•Structural Engineering	42,75
			Clinical Laboratory (Medical) Technology (B.S.)	A&S 35,69-70
Agromony (B.S., M.S., Ph.D.)	ABS/Ag	30,156	Computer Science (B.S., minor)	ENGR 42,77-78
•Business		156	Counseling, Guidance and Personnel Services (M.Ed.)	Grad 87
•Plant Protection		157	Criminal Justice (minor)	A&S 36,162
•Production		156	Dairy Science (M.S.)	Grad 79
•Soils		156-157	Dairy Manufacturing (B.S.)	ABS/BS, ABS/Ag 30,78-79
Animal Science (B.S., M.S., Ph.D.)	ABS/Ag	30,59-61	•Business	79
•Business		60	•Science	79
•Production		59	Dairy Production (B.S.)	ABS/BS 79
•Science		59	•Business	79
•Specialized Teaching		60	•Science	79
Art* (B.A., B.S., minor)	A&S	35,171-173	•Specialized Teaching	79
•Graphic Design		172	Dance Education (minor)	A&S 35,105,107
•Visual Arts		171	Economics* (B.A., B.S., M.S., minor)	ABS/Ag, A&S 80-85
Athletic Training (minor)	A&S	35,105	•Commercial Economics	35,81-82
Biology* (B.A., B.S., M.S., minor)	ABS/BS, A&S	30,35,62,63-64	•General Economics	35,82-83
Botany* (B.S., minor)	ABS/BS, A&S	30,35,64-65,66	Education Administration (M.Ed.)	Grad 87
Chemistry — General* (B.A., B.S., M.S., minor)	A&S	68	Education (preparation for teaching certification — secondary education)	EDUC 38-40, 88-89
Chemistry — Food & Nutrition (B.S.)	A&S	68	Electrical Engineering (B.S.)	ENGR 90-92
Chemistry Professional (B.S.)	A&S	68	•Bioengineering	42,91
Child Development and Family Relations (B.S., minor)	HOEC	48,72-74	•Communications and Advanced Electronics	42,90
			•Computers-Data Processing Systems	42,90

•Power Systems		42,90
•Remote Sensing		42
Engineering (M.S.)	Grad	See Grad Catalog
Engineering Physics (B.S.)	ENGR	42,153-155
Engineering Technology-electronics (B.S.)	ENGR	42,100-102
English* (B.A., M.A., minor)	A&S	92-94
Entomology (M.S.)	ABS/Ag,	157
Environmental Management (B.S.)	ABS/Ag	30,35, 42,57,63,103 94-95
European Studies Program		94-95
•French*(B.A., B.S., minor)		35,97
•German*(B.A., B.S., minor)		35,97-98
•Spanish*(B.A., B.S., minor)		35,98
General Agriculture (Assoc., B.S.)	ABS/Ag	28,30,32
General Engineering	ENGR	42,98-102
•Technology (B.S.)	ENGR	42,99
•Electronics (option)	ENGR	42,100-102
General Registration (undecided majors)	GR	44-47
•No Preference		44
•Social Science		44
•Science Oriented		44
Geography* (B.A., B.S., M.S., minor)	A&S	35,102-104
•Environmental Management		103
•Technical Geography — Foreign Language		103
•Technical Geography — Science		103
•Urban and Regional Planning		103
General Studies	A&S	35,36
Health Education (minor)	A&S	35,105,107
Health, Physical Education and Recreation(B.A., B.S., M.S.)	A&S	35,104-110
•Athletic Coaching Concentration		35,105
•Elementary Physical Education Concentration		35,105
•Adult Fitness & Cardiac Rehabilitation Concentration		35,105
Health Science (Public Health Science), (B.S., minor)	NURS	50,110-111
History* (B.A., B.S., minor)	A&S	35,111-113
Home Economics (M.S.)	Grad	48,115
Home Economics Education (B.S.)	HOEC	48,113- 114,115
Home Economics Extension (B.S.)	HOEC	48,114
Home Economics Journalism (B.S.)	HOEC	48,121
Home Management and Consumer Studies (minor)	HOEC	48,113
Honors Program	A&S	116
Horticulture (B.S.)	ABS/Ag	30,116-120
•Business		117
•Science		117
•Specialized Teaching		117
Indian Area Studies (minor)	A&S	35,120
Industrial Management (M.S.)	Grad	See Grad Catalog
Interior Design (B.S.)	HOEC	48,169-170
International Agricultural Option	ABS	33
Journalism* (B.A., B.S., M.S., minor)	A&S	35,121-124
•Advertising		121
•Broadcast Journalism		121,122
•News-Editorial		121-122
•Science & Technical Writing		121,123
Landscape Design (B.S.)	ABS/Ag	30,118
•Latin American Area Studies	A&S	35,126
Mathematics* (B.A., B.S., M.S., minor)	A&S	35,126-129
Mechanical Engineering (B.S.)	ENGR	42,129-132
•Aeronautics		42,130
•Environmental Engineering		42,130
•Heat-Power Engineering		42
•Industrial Engineering		42,130
•Machine Design		42,130
•Nuclear Engineering		42,130
•Thermal Engineering		42,130
Mechanized Agriculture (B.S., minor)	ABS/Ag	30,132-133
•Business		132
•Equipment & Processing		133
•Irrigation		133
•Science & Production		133
•Vocational Agriculture Teacher		133
Medical Technology (see Clinical Laboratory Technology)		133-135
Microbiology (B.S., M.S., minor)	ABS/Ag, A&S	30,35,134- 135
Military Science (minor)	A&S	35,136-137
Music Education (B.M.E.)	A&S	35,139
Music Major (B.A., minor)	A&S	35,137-141
Music Merchandising (B.S.)	A&S	35,138
•Music Choral Option		35,138

•Music Instrumental Option		35,138
Nursing (B.S., M.S.)	NURS	50,142-146
Nutrition & Food Science	HOEC	48,146,150
•Dietetics		48,146
•Food Science		48,147-148
Park Management (B.S.)	ABS/Ag	30,118-119
Pharmacy (B.S., five year program)	PHARM	51,150-152
Philosophy (minor)	A&S	35,152
Physical Education (minor)	A&S	105
Physical Therapy (B.S.)	A&S	35,105,106,108- 109
Physics* (B.S., minor)	ENGR, A&S	35,153-155
•General Physics		35,154
•Professional		35,154
Science Teaching		35,154
Plant Pathology (M.S., minor)	A&S, ABS/Ag	156
Political Science* (B.A., B.S., minor)	A&S	157
Printing (Assoc)	A&S	28,124-126
Printing Education (B.S.)	A&S	35,124,125
Printing Journalism (B.S.)	A&S	35,124,125
Printing Management (B.S.)	A&S	35,124-125
Psychology* (B.A., B.S., minor)	A&S	35,161-162
•Applied Option		36,161
•Pre-professional Option		36,161
Psychological Services (B.A., B.S.)	A&S	35,161
Public Recreation (B.A., B.S.)	A&S	35,105, 109- 111
Range Science (B.S., minor)	ABS/Ag	30,61-62
Religion (minor)	A&S	35,152-153
Restaurant Management (B.A., B.S.)	A&S, HOEC	35,48,148- 149
Rural Sociology (B.S., M.S.)	ABS/Ag	30,162-164
Sociology* (B.A., B.S., Ph.D., minor)	A&S	35,162-164
•General Sociology		36,162
•Human Services Option		36,163
•Criminal Justice minor (Cooperative program with USD-Vermillion)		36,163
•Personnel Option		36,162
•Social Work Option		36,162
Speech* (B.A., B.S., M.A., minor)	A&S	35,165-167
•Communication Disorders		36,166
•General Speech		36,165
•Mass Communications		36,166
•Speech Communications		36,165
•Theatre		167
Teacher Education (M.Ed.)	Grad	40
Teaching Minors	EDUC	39
•Biological Science		39
•General Science		39
•Language Arts		39
•Physical Science		39
•Social Science		39
Textiles & Clothing (B.S., minor)	HOEC	167-169,170
•Apparel Design		168
•Retailing		168-169
Wildlife and Fisheries Science (B.S., M.S.)	ABS/BS	173-174
Women's Studies (minor)	A&S	174
Zoology* (B.S., M.S., minor)	ABS/BS, A&S	62-63,65- 66,67

## Preprofessional areas of study

Pre-Architecture (1-2 yr).....	42,99
Pre-Chiropractic (3-4 yr).....	44-45
Pre-Dental (4 yr).....	45
Pre-Forestry (2 yr).....	30,47,120
Pre-Law (4 yr).....	45,159,162
Pre-Medical (4 yr).....	45-46
Pre-Ministerial (1-2 yr).....	46
Pre-Mortuary (1-2 yr).....	46
Pre-Optometry (2-4 yr).....	46-47
Pre-Veterinary Science (2-3 yr).....	30,47,171

## Key to colleges administering individual curriculums

A&S	= College of Arts & Science
ABS/ Ag	= College of Agriculture & Biological Science, Agriculture Science Curriculum
ABS/BS	= College of Agriculture & Biological Science, Biological Science Curriculum
ENGR	= College of Engineering
EDUC	= Division of Education
HOEC	= College of Home Economics
GR	= College of General Registration
NURS	= College of Nursing
PHARM	= College of Pharmacy
Grad	= Graduate level program; contact the Graduate School for more information



---

# The Summer Session

Barbara M. Audley, Director  
Box 2218  
Brookings, SD 57007-0599

---

SDSU offers a wide range of courses and degree programs during the summer months as well as numerous special workshops, short courses, evening offerings, and non-credit programs. Summer programming is offered May through July and is

characterized by innovation and responsiveness to your needs. Classes are comfortably sized and more time is available for individual attention from the faculty member. Participants need not be regularly matriculated at SDSU but may be admitted as

special students through completion of one short form.

For further information and to receive the schedule of offerings, contact the Summer Session office, PC 201, 688-5193.

---

# Lifelong Learning and Outreach

Barbara M. Audley, Director  
Box 2218  
Brookings, SD 57007-0599

---

The Division of Lifelong Learning and Outreach is regentally constituted as one coordinative authority for off-campus educational programs (1963-99 BOR) and as such serves as a conduit for the university's service mission to South Dakota citizens. Lifelong Learning and Outreach is designed to be self-supporting, i.e., tuition collected covers expenses incurred, both for credit courses and non-credit conferences, short courses and workshops.

**Office of Credit Programs:** Outreach courses carrying academic credit are coordinated through this office. Academic standards and policies governing off-campus courses are identical to the on-campus instructional program. Hence, credit course offerings, instruction and academic standards are the responsibilities of the Vice

President for Academic Affairs, deans of the colleges, and department heads. There are outreach locations throughout South Dakota where credit courses are presented each semester. Additional locations are added as need and enrollment indicate. Ask for a copy of the current Lifelong Learning Showcase for details and locations.

**Office of Conferences and Institutes:** The university encourages involvement of its faculty and professional staff with groups sharing common interests and expertise. Individuals and groups interested in holding conferences or meetings at the university should contact the Office of Conferences and Institutes. This office provides services ranging from simple logistics either on campus or at other locations

throughout South Dakota, to program planning, staffing, financing, and evaluation.

Consulting and technical assistance to organizations is another contribution of the university to the social and economic development of the state. The Office of Conferences will be happy to assist in matching needs with expertise within the university upon request.

For further information and copies of publications, either for credit programming or conferences and institutes, please contact the Division of Lifelong Learning and Outreach, PC 201, South Dakota State University, Box 2218, Brookings, SD 57007-0599, 605/688-5193.

---

# The Graduate School

Christopher P. Sword, Dean  
Box 2201  
Brookings, SD 57006-1998

---

SDSU granted its first Master's degree in 1891. In 1957 the Graduate School was established. Both Masters and Doctoral degrees are offered through the Graduate School.

The Graduate Faculty is composed of the President, Vice President for Academic Affairs, Graduate Dean, academic deans, heads of departments in which graduate courses are given, and other faculty chosen

on the basis of their background and experience. Faculty members are authorized to teach graduate level courses and to serve as advisers to graduate students or on advisory examining committees.

## Graduate Credit for Seniors

---

A senior within 15 credits of completing the undergraduate curriculum with a grade point average of 2.5 or a junior-senior grade point average of 3.0 may receive credit for graduate courses in addition to the courses

necessary to complete undergraduate work. Course load may not exceed 18 credits. Courses must be designated for graduate credit at the time of registration. Forms requesting permission to register for these

courses are available at the Graduate office. Permission to take courses for graduate credit while a senior does not constitute admission to the Graduate School.

## Admission to the Graduate School

---

For information regarding admission to the Graduate School, departments offering graduate instruction, graduate courses

available, as well as information on graduate fellowships and assistantships, write the Dean of the Graduate School, South Dakota

State University, Box 2201, Brookings, SD 57007-1998, for the latest Graduate Bulletin.

## Campus Services to Assist the University Community

---

### Student Affairs Division

---

The Student Affairs Division, in addition to assisting you gain admission to the university, arranging food, lodging and financial aid, makes available other staff services and coordinates out of class programs designed to help you gain the greatest benefits from a University education. The Dean of Student Affairs office is located in room 314, Administration building, 688-4121. The Student Affairs departments, services and programs offered are described below.

**Admissions** — Questions concerning enrollment information, admission and transfer evaluation should be directed to Admissions office, room 200, Administration building, South Dakota State University, Box 2201, Brookings, SD 57007-0649, telephone number (605) 688-4121.

**Records** — The Office of the Registrar is responsible for academic record keeping, registration, transcript preparation and graduate certification. The Registrar's office is in room 200, Administration building, telephone number (605) 688-4121.

**Financial Aids** — Financial aids information and assistance, including veterans service benefits and student withdrawals, are provided by the Financial Aids office in room 106, Administration building, telephone number (605) 688-4121.

**Veterans Affairs** — SDSU is a fully accredited university to provide GI Bill educational assistance for qualified veterans and dependents. In general, military personnel with service prior to January 1, 1977, more than 180 days active duty and less than 10 years from the date of their discharge are eligible. If circumstances beyond your control delayed you from completing your education within the 10-year period, a waiver of this requirement may be obtained. If service began after January 1, 1977, and you contributed to the Veterans Educational Assistant program, you may be eligible to receive benefits. Eligible dependents and veterans should contact the Veterans Service office, room 312, Administration building, South Dakota State University, Box 2201, Brookings, SD 57007, for application forms and information concerning their benefits.

SDSU is also approved for processing a state program which provides 50% free tuition for national guard students who are eligible. If you have questions concerning this program, please contact the Registrar's Office, room 200, Administration building, South Dakota State University, Box 2201, Brookings, SD 57007-0498.

The Veterans Service Office is available to serve all veterans and dependents in need of assistance. You are encouraged to visit the campus office prior to enrolling in school to obtain full details of assistance and additional counseling available on degree programs.

If you are interested in social activities you are cordially invited to become a member of the SDSU Veterans Society. The Veterans Society is one of the largest social organizations at SDSU.

Tutorial assistance is available. Up to four credits may be granted for military service. This is for military experience and is not applied to exempt any course. SDSU offers advanced payments to students.

**Counseling Service** — As you experience university life, you will be facing new issues, re-assessing values, and making decisions. "Sorting things out" in one-to-one counseling and in groups on personal-emotional-vocational matters is what counseling is about. Special services on study skills, self-confidence, math anxiety, stress management, and sexuality concerns are available. All counseling is strictly confidential. Call 688-6146, West Hall 109.

## Health Service

All usual outpatient services, including GYN examinations, are provided plus limited infirmary care. When medically indicated, appropriate referral will be arranged. Laboratory services, certain medications and physical examinations (excluding pre-entrance exams) are provided on a fee-for-service basis. All enrolled fee-paying stu-

dents are eligible to receive services. A supplemental hospitalization, accident and sickness insurance program is available for all students at registration. The Health Service is located on the second floor of West Hall and is open from 7:00 a.m. Monday until 7:00 a.m. Saturday during the fall and spring semesters. Summer school hours are

7:00 a.m. - 4:00 p.m. daily Monday through Friday. When Student Health Service is closed during the school sessions students may go to the Brookings Hospital emergency room for care. There is partial reimbursement for emergency room care when Health Service is closed.

You may call 688-4157 for further information.

## Career and Academic Planning Center

Planning for the type of career you want after graduation should begin the moment you sign up for your first class at SDSU. The Career and Academic Planning Center, located in Medary Commons, houses the following services to assist you with that planning.

### Career Planning Services

If you're looking for assistance in selecting a major, planning for a career or finding a job, the CAP Center is the place for you. Through our office you can visit with a career counselor; take an interest/skills inventory or complete a computer aided guidance program which should help match your interests with the interests of people working in a wide variety of careers; or participate in career development workshops. Our Career Resource Center provides information on over 21,000 careers, major employers in the United States, various academic majors at SDSU, and the employment status of SDSU graduates. We also offer CGPS 243 Career Planning and Development, a one credit class for students who want structured help in exploring the world of work.

### Academic Advising

At SDSU, each student is assigned to a faculty adviser who is available to answer questions and to aid in academic planning. Students in the College of General Registration are assigned to advisers through the CAP Center who are specially trained to help them decide about their academic goals. In addition, students from all academic disciplines are encouraged to stop by and visit with the CAP advisers when needing additional academic planning assistance.

### College of General Registration

The College of General Registration is for students who are undecided about selecting a major and who would like to explore their interests and abilities and the majors at SDSU before declaring a major. See pages 44-47 for more information.

### Cooperative Education Program

The University's Cooperative Education Program provides the student an opportuni-

ty to integrate classroom study with periods of planned and supervised professional work experience with cooperating business, industrial, and governmental agencies.

Cooperative Education can provide you with an opportunity to apply and extend classroom learning, experience "real" problems, enhance self confidence, improve interpersonal relationships, improve communication skills, develop maturity and independence, and experience early career exposure. The program can also provide you an opportunity to earn while you learn through paid career-relevant employment opportunities.

Program requirements vary from one academic department to another and include such considerations as year in school, grade point average, and academic courses completed. Students are generally eligible to participate after completion of their sophomore year provided they have achieved a minimum grade point average of 2.0.

Academic credit is offered for cooperative education. The amount of credit students may earn varies from one department to another. The length and nature of the experience and other related academic assignments are considered in determining credit.

Upon completion of a program which included a cooperative education experience, you will not only receive a degree, but also will have acquired professional work experience in your chosen field. This combination of a degree plus experience can be a valuable asset when seeking permanent employment.

### Placement Services

When you start looking for your first job after graduation, the Career and Academic Planning Center will assist you in developing your job hunting skills and in contacting employers. In addition to the over 150 companies who recruit on campus each year, we annually receive between 6,000 and 8,000 job vacancies from employers which are published in a weekly job vacancy list. Seniors also establish a professional credentials file at the Career and Academic Planning Center. In addition to senior placement, the Center assists undergradu-

ates in finding part-time, summer jobs, workstudy openings and cooperative education internship/jobs.

### New Student Orientation and Pre-Registration

After you apply for admission to SDSU you will receive information about attending the summer pre-registration program. During pre-registration you can take placement tests in math and foreign language; meet with an academic adviser; pre-register for fall semester classes; and explore the campus.

The New Student Orientation program, which takes place just prior to the beginning of the semester, is designed to provide you with information about University policies, procedures, and services.

### Department of Student Activities

The Department of Student Activities (DSA) is located in the University Student Union. The various services provided include the S.A. Bookstore, Grand Market Place, meeting rooms, Volstorff Ballroom, Jacks' Place, Walder Dining Room, Craft/Print Shop, Leisure Skills Center, Union Service Center, Program Office, Central Scheduling, and University community check-cashing. Student offices include University Program Council, Hobo Day Committee, Collegian/Jackrabbit publications, Interfraternity Council, Panhellenic Council, Students' Association, Student Federation, S.A. Lawyer, and Off-Campus Housing.

The DSA Program Office coordinates the activities sponsored by the University Program Council and the Harding Distinguished Lecturer and Fine Arts Committees. Advance tickets for such events may be purchased at the Union Service Center. The Program Office can also provide information concerning, or advisement to, sororities, fraternities, and other University-recognized student organizations.

Phone 688-6127 for information or 688-4022 for Central Scheduling (room/space reservations).

---

# Academic Support Services

---

## Instructional Media

---

Instructional media services at SDSU allow faculty and students access to the latest in instructional technology. Audio-visual equipment and materials are available through the instructional media services area.

Instructional media services are located in 3 facilities and include a film library, photo lab, equipment distribution and production center, closed circuit television, and the Dial Access Center.

The film library, photo lab, and graphics are located in Pugsley Hall 101. The film library boasts of a film collection of approximately 1700 films and a large collection of slides, filmstrips, video and audio tapes.

Equipment distribution services are located in the Rotunda for Arts and Science. The latest in audio-visual equipment including multi-image and video tape equipment are available along with standard items such as cassette tape recorders and movie projectors. The center also assists faculty and students in the production of their own materials.

The Dial Access Center, located in the Home Economics-Nursing Building, serves as an audio-visual resource center. Audio and video taped programs made available by instructors are programmed on tape recorders for student study or review. Those using the lab dial a listed number and the recorded program is played back via headphones. There are 55 study carrels in the center.

Closed Circuit or Instructional Television (ITV) is available for student and faculty use. Closed circuit television is distributed to campus classrooms from the Dial Access Center. Instructional television (ITV) assistance for course development is available from the Instructional Media Service Center in Pugsley Center.

The Computer Terminal Center is located in the Administration building, room 142. Housing the largest cluster of computer terminals on campus, the Center provides terminal access for students and faculty who wish to use the computer in

classroom activities. Other terminals accessible to students and faculty are housed in Scobey Hall, Harding Hall, Agricultural Hall, Crothers Engineering, Home Economics/Nursing, Ag Engineering, and the Briggs Library.

The Center is open daily to serve the educational needs of the SDSU campus. Monitors are available to help students who have technical difficulties with assigned programs. Specific hours of availability are posted in the Center.

The Center also assists faculty members who wish to implement computerized instruction in their courses. In addition to maintaining a computer resource library, the Center staff consults with and helps faculty who wish to explore educational applications such as drill and practice, computer managed instruction, tutorial instruction, and simulation. The Center also sponsors periodic workshops on computer usage.

## Hilton M. Briggs Library

---

Library services and collections are housed in the spacious three-level Briggs Library, which is named for President Emeritus Hilton M. Briggs. Open 96 hours per week, the Library contains seating for more than 1,000 readers. The library collections

contain more than 380,000 bound volumes, 340,000 government publications, and 285,000 items on microfilm, microfiche, or microcards in addition to newspapers, maps, and pamphlet materials. More than

3,800 periodicals titles are received currently. Photocopying equipment, microform readers, typing rooms, and conference rooms are maintained for the use of students and faculty.

---

## Student Activities, Organizations and Government

---

Student involvement in campus organizations and self-government is extensive at SDSU. Complete details on campus organizations appear in the Student Policies Manual.

# Student Code of Freedom and Responsibility

Academic institutions exist for the transmission of knowledge, the pursuit of truth, the development of students and the general support for the well-being of society. Free inquiry and expression are indispensable to the attainment of these goals. Freedom to teach and freedom to learn are inseparable facets of academic freedom. The freedom to learn depends upon appropriate opportunities and conditions in the

classroom, on campus and in the community. You are expected to exercise this freedom with responsibility.

The Student Code, which appears in the Student Manual, is the basic guideline reflecting university-student relations. The code defines your behavior, your expectations and related university conduct and judicial procedures.

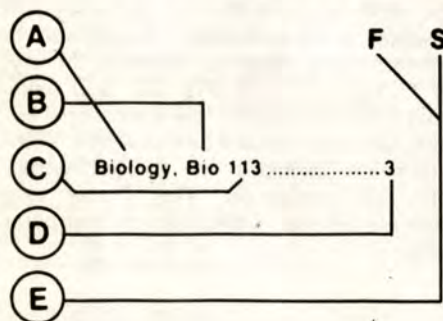
Complete details concerning disciplinary procedures and regulations pertaining to residence halls, parking and traffic, student organizations and activities will be found in the Student Policies Manual.

Copies of the manual are available at the President's office, each Dean's office, the Student Union, the Residence Halls, and the Student Affairs office.

## How to Read Catalog Entries

The following pages present courses of instruction offered in alphabetical order by department. The catalog contains three important entries: a brief description of the department, an outline of the curriculum required of a student major and a description of the courses offered.

### Curriculum Entries



- A** Name of the course.
- B** Department offering the course.  
A complete description of the course will be found by looking for Biology 151 under the Biology Department.
- C** Course number. The first digit of the three-digit number indicates the level of instruction, as follows: 0=Pre-college, non-degree; 1=Freshman; 2=Sophomore; 3=Junior; 4=Senior.
- D** Number of credits assigned to the course. One credit is usually interpreted as one hour of class work per week or as two to three hours of lab work per week.
- E** The abbreviations FS refer to semesters of the academic year — fall and spring.

#### Undergraduate Courses:

1-99 Pre-college, non-degree credit; 100-199 Freshman level; 200-299 Sophomore level; 300-399 Junior level; 400-499 Senior level; 500-599 Fifth year pharmacy level.

#### Graduate Courses:

##### 500-599

Open only to selected undergraduate Junior and Senior students having the necessary prerequisites. May not be used as a requirement for the Bachelor's degree, but may serve as electives.

Taught in conjunction with 600-699 graduate level courses but with undergraduate tuition rate.

##### 600-699

Graduate level taught in conjunction with 500-599. Graduate tuition rate.

Open to senior students for **graduate credit** under the following conditions:

Within 15 credits of completing Bachelor's degree; Have an overall grade point average of 2.5 or higher, or a Junior-Senior grade point average of 3.0 or higher; Enroll for no more than 18 credits (9) credits during Summer School; The course or courses are not required for the Bachelor's degree.

##### 700-799

Graduate level only (except seniors by permission, see graduate bulletin.)

##### 800-899

Doctoral and post-doctoral level courses.

##### 900-999

Post-baccalaureate courses not for degree credit.

#### Experimental Courses

Courses ending in 98 or 99 are experimental, offered for a maximum of two years without approval of the Regents of Education.

### Course Descriptions

1 2 3 4 5 6  
151 Introductory Biology 3 (2,3) FSSu

Fundamental concepts: the cell structure, function, chemistry and reproduction, molecular and Mendelian genetics; plant and animal diversity through evolution; and ecology.

- 1 Course number.
- 2 Course name.
- 3 Number of semester credits assigned to the course.
- 4 The first number inside the parenthesis indicates the number of recitation hours per week and the second number is the number of laboratory hours per week that the course requires.
- 5 Semesters in which the course is taught. F = Fall; S = Spring; Su = Summer.
- 6 A brief description of the course. This section will also include other information affecting your enrollment in the course. A course description might include, for instance: "P, Math 333." This means that Math 333 is a prerequisite and must be taken before enrollment in this course. Other information included in various course descriptions would be: "Alternate years," "Not open to majors," "May be repeated for a total of six credits," etc.

## Miscellaneous Abbreviations

admin, administration  
 adv, advanced  
 Ag, Agriculture  
 Am, American  
 AY, alternate years  
 &, and  
 chem, chemistry  
 comp, composition  
 dev, development

econ, economics  
 ed, educational  
 F, fall semester  
 fr, freshman  
 fund, fundamentals  
 gen, general  
 intro, introduction  
 jr, junior  
 prin, principles

L, or lab, laboratory  
 R, recitation (lecture)  
 S, spring semester  
 S.D., or SD, South Dakota  
 soph, sophomore  
 sr, senior  
 Su, summer term  
 TBS, time and/or credit to be arranged  
 U.S., or US, United States

## Associate Degree and Certificate Programs

The university provides a two year associate degree program in General Agriculture and in Printing. A certificate program in Flight Training is also offered to those desiring to prepare for their private pilot license.

The core requirements for Associate Degree programs are as follows:

	credit
Major field .....	16
Minor field .....	12
Constants:	
English .....	3
Speech .....	3
Physical Education .....	2
Science, Math or Language .....	6
Electives (minimum) .....	22
Total Credit†(minimum) .....	64

Graduation Ratio ..... 1.9

These requirements meet the basic elements of the Associate Degree.

Suggested programs are printed for the student's and adviser's use.

In many cases substitutions may be made where courses outlined are not available during the period of your enrollment. Substitution must be made on the recommendation of your classifying officer.†

Students enrolled in the two-year program in General Agriculture or the two year program in Printing, who have not met the minimum high school course requirements for a four-year baccalaureate program will be allowed to enter a baccalaureate program

only after they have satisfied any deficiencies as outlined in Section II (Provisional Admission) under Admission Requirements. And they must have successfully completed 3 credits of English or Speech; 3 credits of Mathematics, 3 credits of Natural Science and 3 credits of Social Science with a GPA of 2.0.

†Students entering this program cannot transfer to a four-year degree program until they have satisfactorily completed 3 credits of English or Speech, 3 credits of Mathematics, 3 credits of Natural Science and 3 credits of Social Science with a GPA of 2.0. In addition, students not meeting the minimum high school course requirements for admission to a four-year baccalaureate program, will be allowed to enter the baccalaureate program only after they have satisfied any deficiencies as outlined in Section II (Provisional Admission) under the Admission Requirements.

## Aviation Education (Avia)

### Division of Education

David Card, Instructor

Courses are taught by qualified flight and ground school instructors. Those completing the courses and passing the Federal Aviation Administration examinations, are near to requirements for Private Pilot's license.

**270 Introduction to Aviation 3(3,0) FS**  
 Aerodynamics, principles of flying, Federal air regulation, meteorology, radio and navigation.

**272 Intermediate Flight Training 2 FSSu**  
 Dual instruction given in basic flight maneuvers required for solo flight. Preflight and post-flight briefings held with each flight. P, Avia 270. Fee \$500.

**372 Advanced Flight Training 2 FSSu**  
 Advanced phases of flying, including solo, cross-country flights and all phases of flight training. Course given in full compliance with FAA regulations. P, Avia 272 or equivalent. Fee \$500.

# Printing

## Department of Journalism and Mass Communication

This two-year technical program in printing is designed primarily for students who wish to become craftsmen. It provides two years of general education coupled with practical shop courses and experience. The program is structured to allow transfer to the four-year Bachelor of Science degree program in printing with no loss of credit. Curriculum requirements include at least 9 of the 12 credits required for a minor in communications.†

†Students entering this program cannot transfer to a four-year degree program until they have satisfactorily completed 3 credits of English or Speech, 3 credits of Mathematics, 3 credits of Natural Science and 3 credits of Social Science with a GPA of 2.0. In addition, students not meeting the minimum high school course requirements for admission to a four-year baccalaureate program will be allowed to enter the baccalaureate program only after they have satisfied any deficiencies as outlined in Section II (Provisional Admission) under the Admission Requirements.

## Curriculum for Associate Degree in Printing

First Year	F	S
Fr. Comp, Engl 101.....	3 or	3
Fund of Speech, SpCm 101.....	3 or	3
Fitness & Lifetime Activities, PE 100.....	1	1
Basic Presswork, Prtg 111	3	
Intro to Graphic Arts, Prtg 112.....	3	
Composing Machines, Prtg 113.....		3
Algebra, Math 111 or 112		3
Computers & Society, CSc 203.....	2	

Second Year	F	S
Typography, Prtg 211.....	3	
Photography, MCom 160..	2	
Press & Bindery, Prtg 212.....	2	
Pricing, Prtg 214.....	2	
Newswriting & Reporting, MCom 210.....	3 or	3
Reproduction Photography Prtg 213.....	4	
Physical Science.....		4
Electives to complete 64 credit hours.....		

## General Agriculture

### College of Agriculture and Biological Sciences

A two-year program is designed for the student who does not find it advisable or possible to enter a regular four-year college program. A typical student in this situation could be one who desires some education but not necessarily four years before returning to the farm or ranch. The core requirements are as follows:

	Credits
English.....	3
Physical Education.....	2
Education.....	2
Speech.....	3
Science and/or mathematics.....	6

Major field of concentration*.....	16
General electives.....	34
Total.....	64
Graduation ratio.....	1.9

\*All major field of concentration courses must be from departments within the College of Agriculture and Biological Sciences and be related to agriculture. All courses in the major field of concentration need not be in one department, although this may be a possibility. Consult with your adviser in the selection of major field of concentration courses. These courses should relate to your career interests.

General electives may be selected from any area. Electives are offered so students may develop special talents or interests in General Agriculture. The choice of

subjects is left to the student, providing the selections made are consistent with the academic standards of the University and of the College of Agriculture and Biological Sciences.†

†Students entering this program cannot transfer to a four-year degree program until they have satisfactorily completed 3 credits of English or Speech, 3 credits of Mathematics, 3 credits of Natural Science and 3 credits of Social Science with a GPA of 2.0. In addition, students not meeting the minimum high school course requirements for admission to a four-year baccalaureate program will be allowed to enter the baccalaureate program only after they have satisfied any deficiencies as outlined in Section II (Provisional Admission) under the Admission Requirements.



# South Dakota

# SWANEE

# Colleges



# Agriculture & Biological Sciences

Richard A. Battaglia, Acting Dean  
 Gene Arnold, Acting Associate Dean  
 Box 2207  
 Brookings, SD 57007-0191

The academic program in the College of Agriculture and Biological Sciences is two-fold: One deals with the traditional field of agriculture and the other biological sciences. A core curriculum is available in each of these two broad fields of endeavor.

Agricultural work is divided into four areas — resident instruction, research, extension, and statewide services. Experiments and investigations for the benefit of agriculture are carried on in connection with problems of livestock, soils, field crops, veterinary science, horticultural crops, agricultural economics, plant pathology, rural sociology and mechanized agriculture. The results of research form the basis for classroom instruction, for extension work, and for a means of answering inquiries coming to the college. The Extension Service takes the work of instruction statewide by bringing results of research to every home.

Agriculture includes technical, professional, and business occupations dealing with producing, processing, and distributing farm products. The agricultural teachers, agricultural researchers, men and women who assist the farmer with their complex needs, farmers and ranchers themselves, processors of farm products, and retailers are all part of modern day agriculture.

Work in biological sciences is mainly in the departments of Biology, Dairy, Microbiology, and Wildlife and Fisheries Sciences. One also must realize that biological science is an integral part of all departments that deal with plant and animal sciences. Many future biology teachers, wildlife biologists, plant and animal physiologists and geneticists will find the program in biological sciences a fruitful one to follow.

The biological sciences include all technical and professional occupations dealing with the basic fields of plant and animal life, collectively called biology. Such public agencies as high schools, colleges, and universities, park services, fish and wildlife agencies, etc., are all demanding educated individuals capable of assuming responsible positions in society. All curricula lead to the Bachelor of Science degree.

Most students in the College of Agriculture and Biological Sciences will be required to take basic core courses. The greater share of these courses should be taken during the first and second years of college.

Freshmen may enter these curricula without specifying a major. You, however, should make your major and option choice by the last semester of the sophomore year.

The purposes, objectives, and requirements of various majors and options are outlined in the discussions under the various departments. If at any time you desire a change in major and/or option, you should report to the associate dean of resident instruction for adviser reassignment.

You must complete a minimum of 25 semester credit hours in courses numbered 300 or above to qualify for the B.S. degree.

Mathematical Analysis 224-225 may be counted toward the total.

At the discretion of various departments a minimum of 24 semester credit hours shall constitute a major; 16 credits a minor.

The core curricula which follow include the over-all college and university requirements. You should make every effort to complete these requirements as early as possible in the four-year program.

## Agricultural and Biological Science Curricula

Major Field	Curriculum	Department Administering
Agricultural Business	Agriculture	Economics
Agricultural Economics	Agriculture	Economics
Agricultural Education	Agriculture	Education
Agricultural Extension	Agriculture	Education
Agricultural Journalism	Agriculture	Journalism
Agronomy	Plant Science	
Animal Science	Agriculture	Animal and Range Science
Biology	Biological Science	Biology
Botany	Biological Science	Biology
Dairy Manufacturing	Agriculture	Dairy Science
	Biological Science	Dairy Science
Dairy Production	Agriculture	Dairy Science
Environmental Mgmt	Biological Science	Biology
General Agriculture	Agriculture	Dir. of Resident Instruction
Horticulture	Agriculture	Horticulture, Forestry Landscape and Parks
Landscape Design	Agriculture	Horticulture, Forestry Landscape and Parks
Mechanized Agriculture	Agriculture	Ag Engineering
Microbiology	Agriculture Biological Science	Microbiology Microbiology
Park Management	Agriculture	Horticulture, Forestry Landscape and Parks
Pre-Forestry		Horticulture, Forestry Landscape and Parks
Pre-Veterinary Science		Veterinary Science
Range Science	Agriculture	Animal and Range Science
Rural Sociology	Agriculture	Rural Sociology
Wildlife & Fisheries Sci.	Biological Science	Wildlife & Fisheries Science
Zoology	Biological Science	Biology

# Agriculture and Biological Sciences Curricula

## Core Curriculum in Agriculture

### Leading to the Bachelor of Science degree

Course	Credit
Fitness & Lifetime Activities, PE 100.....	2
Communications(total 11 cr)	
Fr. Comp, Engl 101 & 300.....	6
Fund. of Speech, SpCm 101.....	3
Communications elective†.....	2
Social Science (Total 9 cr.)	
Intro. to Sociology, Soc 100.....	3
Macroeconomics Principles, Econ 201.....	3
or Microeconomic Principles, 202.....	3
Social Science Elective*.....	3
Humanities electives*.....	6
Science & Mathematics (total 17 cr)**	
4 credits chemistry, excluding Chem 100††.....	4
Algebra, Math 111 or Algebra & Trigonometry,	
Math 113.....	3 or 5
Introductory Physics, Phys 101	
or Elementary Physics, Phys 111	
or Gen Physics, Phys 112.....	4
Biological Science*.....	3
Science &/or Math electives‡.....	1-3
Group 1 Courses in Ag (See list following).....	12
Departmental and Option Requirements & General electives.....	71
Total Hours for Graduation.....	128

†Communications elective to be selected from the following:

Technical Communication, Engl 303; Writing in the Sciences, Engl 307; Newswriting and Reporting, MCom 210; Publicity Methods, MCom 313; Magazine; Writing and Production, MCom 315; Writing for Radio and Television, MCom 330; Radio and Television Production, MCom 331; Broadcast Programming, MCom 335; Interpersonal Communications, SpCm 201; Public Speaking, SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335.

\*See approved listing.

\*\*6 credits must be taken from approved sequential course listing.

‡Most department curricula will have specific requirements in this area, but for those which do not, the courses should be selected from the fields of Biology, Botany, Chemistry, Entomology, Geology, Mathematics, Microbiology, Physics, Plant Pathology, Zoology and Wildlife and Fisheries Sciences (Ornithology, WL 363 and Ichthyology, WL 367). Courses in Group 1 which are of a basic nature, PS 305, PS 223, cannot be counted toward this requirement unless they are over and above the 12 credit minimum for Group 1 courses.

††Those students following Microbiology, Entomology, Pre-Veterinary Science, Soil Science or Zoology majors must take Chem 112.

### Group I Courses in Agriculture

A minimum of 12 credits from courses listed below must be selected and should be completed during the first two years. Some departments require all or specific courses, while others leave the selection entirely to the student and the adviser.

Course	Credit
Intro to Animal Science, AS 101.....	3
Livestock Management, AS 219 or Animal Nutrition, AS 223.....	3
Poultry Management, AS 366.....	3
Elements of Dairying DS 130.....	3
Dairy Foods, DS 231.....	3
Farm & Ranch Management AgEc 271.....	4
Ag Marketing, AgEc 354.....	3
Gen Horticulture, Ho 111.....	3
Gen Forestry, F 131; or	
Forest Ecology, F 232; or	
Farm Forestry, F 331.....	2 or 3
Park Admin & Organization, PR 201.....	3
Landscape Design, La 321.....	3
Ag Mechanics, MA 202 or;	
Farm Power & Machinery, MA 213; or	
Electricity for Farm & Home, MA 242; or	
Soil & Water Mechanics, MA 333.....	2 or 3
Crop Production PS 103.....	3
Soils, PS 113.....	3

Plant Pathology, PS 223.....	3
Intro to Entomology, PS 105.....	3
Crop & Livestock Insects, PS 293;	
or Horticultural Insects, PS 295	
or General Entomology, PS 305	
Practical Range Management, Rang 200.....	3
Environmental Conservation, WL 210.....	2

IN ADDITION TO THE BASIC PROGRAM AS OUTLINED ABOVE, THREE OPTIONS ARE POSSIBLE UNDER THE CORE IN AGRICULTURE. THESE OPTIONS ARE BUSINESS, SCIENCE AND PRODUCTION.

### Business Option

For students who plan to enter any of the business phases of agriculture, i.e., sales, administration, public relations, technical advances, etc. Those interested in farming or ranching might also consider this option for each is becoming a significant business enterprise. Students selecting this option will complete the general requirements listed in the College Core for Agriculture plus the following additional requirements to complete their work for a Bachelor of Science degree. The more specific requirements are listed under the appropriate option in each departmental curriculum.

Course	Credits
Macroeconomic Principles, Econ 201 or Microeconomic Principles, Econ 202.....	3
Prin. of Accounting I, Actg 210.....	3
Business Management, B-Ad 360.....	3
Business electives*.....	12

\*The business electives must be chosen from the following courses: Principles of Accounting II, Actg 211; Personal Finance, B-Ad 380; Business Finance, B-Ad 310; Business Law, I B-Ad 350; Business Law, II, B-Ad 351; Money and Banking, Econ 330; Marketing, Econ 353; Agricultural Marketing, AgEc 354; Marketing Management, Econ 452; Statistical Methods.

### Science Option

The student who desires a strong emphasis in the physical and biological sciences will be more able to cope satisfactorily with rapidly occurring scientific advances. This option will also place you in a good position to do graduate work in most agricultural fields. Students majoring in this option will complete the general requirements listed in the College Core in Agriculture plus the following additional requirements. The more specific requirements are listed under the appropriate option for each departmental curriculum.

Mathematics, Chem or Physics.....	15
Biological Science*see approved listing†.....	9

†Courses must be selected from at least 2 of the following areas: Biology, Botany, Entomology, Microbiology, Plant Pathology, Wildlife and Fisheries Sciences and Zoology.

### Production or Technical Option

For the student who desires a broad and more general education in agriculture. Those who plan to return to the farm, do extension work, or serve as fieldmen for breed associations and crop improvement associations will find this the logical option. This option also serves the student well who plans to enter any of the areas of production, such as dairy herd supervisor, greenhouse operator or into the various federal and state agencies upon graduation. No further courses beyond the General Core for Agriculture are required by the college. The more specific requirements beyond the core are listed under the appropriate option in each departmental curriculum.

## Core Curriculum in Biological Science

Course	Credits
Leading to the Bachelor of Science degree	
Fitness & Lifetime Activities, PE 100.....	2
Communications (total 11 cr.)	
Fr. Comp, Engl 101 & 300.....	6

Fund of Speech, SpCm 101.....	3
Communications elective†	2 or 3
Social Science (total 9 cr.)	
Intro. to Sociology, Soc 100.....	3
Macroeconomics Principles, Econ 201.....	3
or Microeconomic Principles, Econ 202.....	3
Social Science elective*	3
Humanities electives*	6
Biological Science (total 13 cr.)	
Intro Biology, Bio 151, 153.....	6
General Microbiology, Micr 231.....	4
Genetics, Bio 371.....	3
Other Science & Mathematics	25-27

Algebra and Trigonometry, Math 111-120 or 113.....	5-6
Elementary Physics, Phys 111-113 or	
General Physics, Phys 211-213.....	8
12 credits of chemistry, excluding Chem 100.....	12
Departmental Requirements & General electives.....	60-62
Total Hours toward Graduation.....	128

†Communications Elective to be selected from the following: Technical Communication, Engl 303; Writing in the Sciences, Engl 307; Newswriting and Reporting, MCom 210; Publicity Methods, MCom 313; Magazine Writing and Production, MCom 315; Writing for Radio and Television, MCom 330; Radio and Television Production, MCom 331; Broadcast Programming, MCom 335; Interpersonal Communication, SpCm 201; Public Speaking, SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335.  
\*See approved listing.

## Agricultural Education (AgEd)

See Division of Education

## Agricultural Extension (AgExt)

See Departmental Listings

## Agricultural Journalism

See Department of Journalism

## General Agriculture

The General Agriculture curriculum is designed for the student undecided as to a major field of study within the area of agriculture and for the individual planning to return to the farm or ranch after college. A large number of free electives are available allowing you to search for a major or take courses in the different disciplines needed to manage a production unit. Two options are included in this curriculum; a two-year Associate of Arts degree (see page 28) and a four-year Bachelor of Science degree.

### Curriculum in General Agriculture, Four-Year Degree Program

Consists of approximately one-fourth agriculture; one-fourth basic science; one-fourth social science, communications, and humanities; and one-fourth elective subjects. When qualifying for a Bachelor of Science degree a student may, through a choice of electives, complete courses in business, prepare for graduate study, or enroll in special areas of study such as plant and/or animal science.

Freshman Year	F	S
Fr. Comp, Engl 101.....	3	
Fitness & Lifetime Activities, PE 100.....	1	1
Crop Production, PS 103..		3
Algebra, Math 111, or Algebra & Trigonometry, Math 113.....	3 or	5
Intro. to Animal Science, AS 101.....	3	
Free electives.....	9	9

Sophomore Year	F	S
Gen. Chem, Chem 110 or 112.....	4	
Farm & Ranch Management, AgEc 271.....	4	
Fund. of Speech, SpCm 101.....		3
Entomology elective.....		3
Macroeconomics Principles, Econ 201.....	3	
Soils, PS 113.....	3	
Plant Pathology, PS 223...		3
Free electives.....	3	7
Junior Year	F	S
Junior Comp, Engl 300....		3
Animal Nutrition, AS 223	3	
Intro Biology, Bio 151-153	3	3
Elementary Organic Chem, Chem 120.....	4	
Gen. Microbiology, Micr 231.....		3
Intro. to Sociology, Soc 100.....		3
Social Science Elective*....	3	
Free electives (300 level or above).....	3	4
Senior Year	F	S
Communications Elective†	2-3	
Genetics, Bio 371.....	3	
Intro. Physics, Phys 101 or Elementary Physics I, Phys 111.....	4	
Humanities Electives*.....	3	3
Special elective††.....		3
Free electives (300 level or above).....	6	8

\* See approved listing.

†Communications Elective to be selected from the following: Engl 303, 307; MCom 210, 313, 315, 330, 331, 335; SpCm 201, 315, 334, 335.

††To be chosen from the fields of mathematics, statistics, computer science, accounting, or business.

### 494,495,496\*Cooperative Education/Internship/Field Experience Program

(May be repeated for credit.) A maximum of 12 credits is applicable toward the B.S. degrees in Agriculture and Biological Sciences. If you have the opportunity to become involved in off-campus activity which promises to contribute significantly to your education you may enroll for and receive 1-12 credits at a maximum rate of 1 credit per week. You must obtain permission to register for such credits from the department in whose discipline and under whose supervision the project will be carried out. The experience planned and method of evaluation of grading should be established by an instructor in consultation with you and under the general supervision of the department head. The project requires the approval of the departmental faculty. Grades will be based on either the A-F or E, F system. Upon project termination, copies of the final examination, report or other evaluation is placed in your cumulative file in the dean's office.

\*To be prefixed and used by the Departments of Animal and Range Sciences, Biology, Dairy Science, Economics, Horticulture-Forestry-Landscape and Parks, Microbiology, Plant Science, Rural Sociology, Mechanized Agriculture under Ag. Engineering, and Wildlife and Fisheries Science.

## Activities

Both nationally known agricultural fraternities, Alpha Gamma Rho and Farmhouse, are organized on campus and provide living accommodations. Students may

pledge any time after the freshman year. During the first semester of the sophomore year, students with outstanding scholarship, leadership, and character may be initiated into Alpha Zeta honor society. Gamma

Sigma Delta an agricultural honor society for seniors with high academic ability, also has an SDSU chapter.

The largest extracurricular activity involving students in the College of Agriculture and Biological Sciences, with participation open to all university students, is the Little International. A two-day function patterned after the International Livestock Exposition in Chicago, Little I is held each year during late winter or early spring. Much experience is gained by students in planning, producing, and managing this event.

Most departments in the College of Agriculture and Biological Sciences have one or more student organizations. You are encouraged to become involved with at least one of these organizations, especially that which is most closely associated with your major field.

## Genetics

Though there is no separate instructional department, a student in Animal Science, Biology, Dairy Science, Horticulture-Forestry-Landscape and Parks, Microbiology, Plant Science, or other departments wishing to specialize in Genetics can obtain an excellent program in this area by selecting the following courses.

Number	Title*	Department	Credits
271	Heredity and Society	Biology	2(2,0) F
343	Cell Biology	Biology	3(2,2) S
371	Genetics	Biology	3(3,0) FSSu
372	Genetics Laboratory	Biology	1(0,2) FSSu
332	Prin of Animal Breeding	Animal and Range Science	4(3,2) S
443	Plant Breeding	Plant Science	(3,0) F (Alt. Yrs.)
<b>Graduate &amp; Senior Level Courses</b>			
536-636	Molecular & Microbial Genetics	Microbiology	4(4,0) F
523-623	Population Genetics	Animal and Range Science	3(3,0) S (Alt. Yrs.)
553-653	Advanced Genetics	Plant Science	3(3,0) S (Alt. Yrs.)
573-673	Cytogenetics	Plant Science or Biology	3(2,3) F (Alt. Yrs.)
581-681	Crop Breeding Techniques	Plant Science	1(1,0) Su (Alt. Yrs.)
592-692	Advances in Microbiology: Gene Engineering	Microbiology	2(1,2) S
593-693	Genetics of Plant Disease Resistance	Plant Science	2(2,0) S (Alt. Yrs.)
597-697	Mammalian Developmental Genetics	Biology	3(3,0) S
598-698	Biometrical Genetics	Plant Science	3(3,0)
<b>Graduate Courses</b>			
600-700	Special Topics, for example: Advanced Plant Breeding	Plant Science	
	Advanced Animal Breeding	Animal and Range Science	
	Biometrical Genetics	Plant Science	
	Chromosome Analysis	Biology	
	Developmental Genetics	Biology	
	Human Genetics	Biology	
780	Advanced Special Prob, for example: Lab problems with Drosophila & Neurospora	Plant Science & Biology	
	Applied Genetic Problems	All departments	

\*Description given under appropriate department.



## International Agriculture Option

Leading to the B.S. in Agriculture or Biological Science

For those who plan to enter any of the various phases of international service that deal with agriculture. In some situations, this service could immediately follow the receipt of the B.S. degree; in other cases, further education in a specific professional area, that leads to a M.S. or a Ph.D. could also be advantageous.

Opportunities of an international nature could involve positions with the following agencies: Peace Corps, AID, World Bank, United Nations, Foreign Agricultural Service, and philanthropic organizations such as the Rockefeller and Ford Foundations. Those who plan to work for commercial companies in another country or those who

plan to become agricultural missionaries could also benefit considerably from this option.

Two Years Foreign Language .....	14
Required Electives* .....	12
Seminar in International Ag .....	2
Group I Electives** .....	(12)
International Experience***	

\*From the following listed courses one course each must be selected from three of the following course areas: economics, geography, history, and political science. The remaining credits to make up the total of 12 may be chosen from any of the remaining courses in the listing.

Gen Anthropology, Anth 200; Cultural Anthropology, Anth 220; Individual & the Family, CDFR 141; Human Development & Personality, CDFR 211; Microeconomics Principles, Econ 202; Marketing, Econ 353; Comparative Econ Systems, Econ 405; Econ of the International Sector, Econ 540; Intro to Human Geography, Geog 241; Geography of Latin America, Geog 313; Geography of the USSR, Geog 314; Geography of Europe, Geog

315; Geography of Asia, Geog 316; Geography of Africa, Geog 317; Geography of Ag, Geog 352; World History, Hist 101-102; History of Russia, Hist 345; History of Latin America, Hist 417-418; Am Diplomatic History, Hist 467-468; Intro to Spanish America & Oriental Culture, Hum 213; Nutrition & Man, NFS 111; Human Nutrition, NFS 321; Current World Problems, PolS 253; International Politics, PolS 351; International Law & Organization, PolS 356; Politics of Eastern & Southern Asia, PolS 446; Politics of Middle East & Africa, PolS 448; Political Theory, PolS 461-462; Gen Psychology, Psyc 101; Social Psychology, Psyc 441; Race & Nationality Problems, Soc 350; Population Problems, Soc 362; Community Development, Soc 440.

\*\* The Group I Electives (ag) are presently included in all curricula leading to the B.S. degree in agriculture but under this option they would also be required for a degree leading to a B.S. in Biological Science.

\*\*\* Experience at a university in another country through international student exchange or other means is encouraged. You are also encouraged to participate in international travel courses or international travel tours with or without credit. However, neither is required.

---

---

# Arts & Science

Rex Myers, Dean

Box 2201

Brookings, SD 57007-0094

---

The College of Arts and Science provides a liberal education and thorough knowledge of the different branches of literature, science, arts and physical education. A liberal education gives students the means to test ideas, beliefs and facts. It exposes them to a variety of academic disciplines that will broaden and deepen their perspectives and enable them to continue the learning process as educated citizens. It teaches them how to apply what they have

learned. By studying the ways of thinking and expression that are intrinsic to the arts, humanities, and social and natural sciences, students are trained in scientific methods, critical thinking, analysis, synthesis, and cogent expression, and are helped to develop intellectual skills, humanistic understanding and aesthetic appreciation. Such an education increases the usefulness of career planning and specialization by laying a foundation for lifelong values.

The fifteen departments in the College of Arts and Science offer major and/or minor programs leading to one of three undergraduate degrees offered by the college. Students in an additional seven departments administered by other colleges in the university also may pursue Bachelor of Science or a Bachelor of Arts degrees administered by the College of Arts and Science.

---

## College of Arts and Science Activities

---

A variety of activities, including many extracurricular activities, are administered within the College of Arts and Science.

Most departments sponsor organizations open to students majoring in the department. In addition, 15 honor organizations open to students who achieve scholastic honors exist within the College of Arts and Science.

**Dramatics and Forensics.** The Speech Department supervises a forensics program in debate, extempore speaking, oral interpretation and oratory. State University Theatre presents a program of major and experimental productions each year. During the summer a season of plays in repertory are given by the Prairie Repertory Theater at Prairie Village in Madison, S. D.

**Music Groups.** The Music Department sponsors a variety of vocal and instrumental groups. Membership is by audition, arranged with the appropriate director, and is open to all University students regardless of major. *Credit is awarded for participation.*

**Choral:** Concert choir, University Chorus, Statesmen (Men's Chorus) Pasquettes (Women's Chorus), Chamber Choir. See p. 137  
**Instrumental:** Civic/University Symphony Orchestra, Marching Band (The 'Pride of the Dakotas'), Pep Bands & Big Blue Brass, Symphonic Band, Concert Band, Jazz Ensembles and various Percussion, Woodwind & Brass small ensembles. See p. 137

**The Ritz Art Gallery.** The Ritz Gallery sponsors an annual program of professional and student exhibitions, including the Juried

Student Exhibition which is open to all SDSU students.

**Intramural Recreation, Sports Clubs and Intercollegiate Athletics.** The Intramural Office in the Department of Health, Physical Education, and Recreation sponsors 35 male, female, and coed intramural sports activities. The office also supervises the following clubs: archery, dance, fencing, ice hockey, karate, scuba diving, soccer, tennis and weightlifting.

The university is a member of the North Central Intercollegiate Athletic Conference and Division II of the NCAA. Eight sports for women and eight sports for men are offered in the athletics program, which are under the supervision of the Department of Health, Physical Education and Recreation.

---

## College of Arts and Science Programs

---

**Cooperative Education, Field Experience and Internship Programs.** These programs allow students to work in various off campus environments (business, legislature, etc.) under supervised conditions and earn credit for their activity as long as the work contributes significantly to the students' education. A maximum of 12 credits may be applied to degrees granted by the College of Arts and Science. Students must obtain permission to register for any credit from specific departments. The experience is planned and the method of evaluation and

grading is established by a professor in consultation with the student and workplace supervisor. Grades may be based on either the A-F or Pass-Fail system.

**Undergraduate Course Specials Program.** (1-5 credits) The College of Arts and Science recognizes the need to make course work relevant and to grant student participation in the formulation of a portion of the university work. Students who wish to study a topic in which a faculty member is competent may propose a Special. The duration, subject matter, amount of credit and

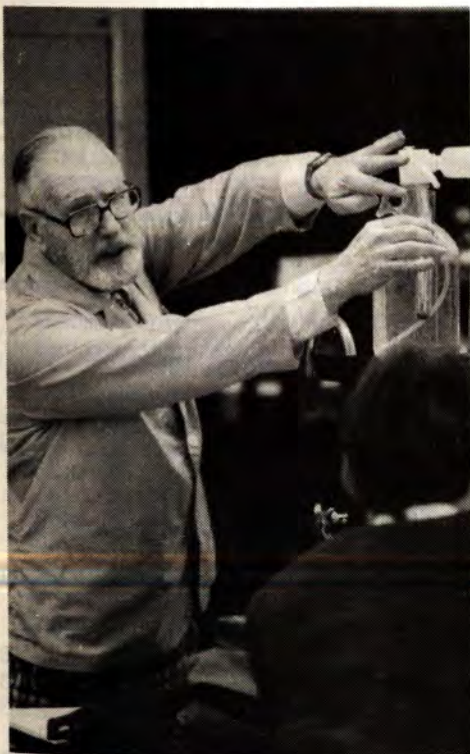
mode of grading will be planned by the instructor and students, under the general supervision of the head of the department in whose discipline and under whose supervision the Special will be taught.

**The Directed Studies Program.** Directed study in selected topics may be repeated for credit. A maximum of 9 credits is applicable toward the B.A. and B.S. degrees granted by the College of Arts and Science. A directed studies program usually arises from a student's interest in a theme, a field of knowledge or a need to acquire a particular skill which a faculty member is competent but

which is not covered by the regular courses. Subject matter covered varies greatly.

**Preprofessional Curricula.** (Dentistry, Law, Medicine, Theology, Optometry, Chiropractory, etc.) Nearly all professional schools require students to obtain a bachelors degree before entering. Many programs in the College of Arts and Science are appropriate undergraduate major fields for these professional schools. Courses required by practically all such schools are available and every assistance is given to students to assure meeting the requirements of the professional school selected. National tests must often be taken during the junior or senior year for admission to professional schools. Staff in the College of General Registration can direct students to special advisers who give help in the selected area of study.

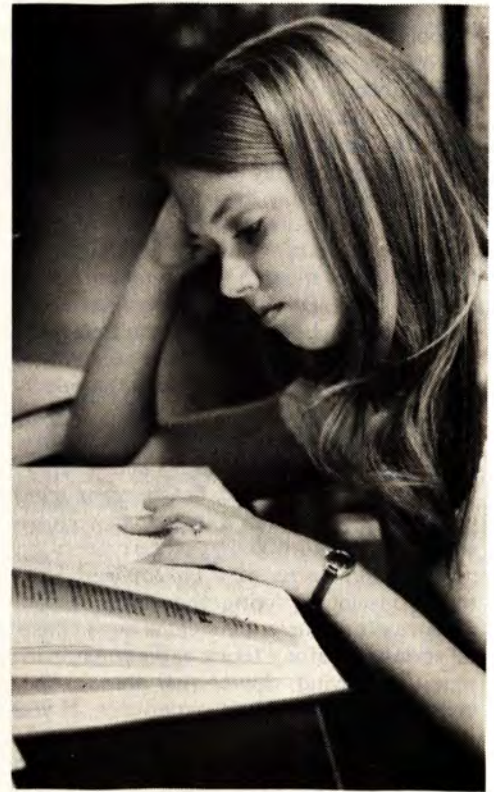
**Living and Study Abroad.** Coordination, Dean's Office, College of Arts and Science. Living and study abroad, before completing work for the bachelor's degree, is both rewarding and stimulating. Information on available programs may be obtained from the counselor on living and study abroad. Opportunities currently include departmental sponsored study tours, experiment in international living, Junior year abroad, special problems, and field experience. If you intend to live and study abroad you should determine prior to departure how much credit, if any, will be granted.



## Arts and Science Curricula

Major and Minor Fields	Options	Department Administering
Aerospace Studies Minor		Aerospace Studies (Air ROTC)
Art (B.A., B.S.)	Art Education Graphic Design Visual Arts	Visual Arts
Biology (B.A., B.S.) Botany (B.S.)		Biology
General Chemistry (B.A., B.S.) Professional Chemistry (B.S.) Food and Nutrition Chemistry Clinical Laboratory (medical) Technology (B.S.)	Applied Chemistry (B.S.) Teaching Option	Chemistry
Economics (B.A., B.S.)	Commercial Economics General Economics Teaching Option	Economics
English (B.A.)	English Education	English
European Area Studies Program		All University program
French (B.S., B.A.) German (B.S., B.A.) Spanish (B.S., B.A.)	Business Specialization Teaching Option	Foreign Language
General Studies Degree (B.A., B.S.)		Arts and Science, Dean
Geography (B.A., B.S.)	Environmental Management Urban & Regional Planning Technical Geog-F.Lang. Technical Geog-Science Planning	Geography
Health, Physical Education, & Recreation (B.A., B.S.) Physical Therapy (B.S.) Public Recreation (B.A., B.S.) Dance Education Minor Health Education Minor Athletic Training Minor Physical Education Minor	Athletic Coaching Elementary Physical Education Concentration Teaching Option Adult Fitness and Cardiac Rehabilitation	Health, Physical Education & Recreation
History (B.A., B.S.)	Teaching Option	History
Indian Area Studies Minor		All University Program
Journalism (B.A., B.S.)	Advertising Broadcast Journalism News-Editorial Science and Technical Writing	Journalism & Mass Communication
Latin American Area Studies		All University Program
Mathematics (B.A., B.S.)	Teaching Option	Mathematics
Microbiology (B.S.)		Microbiology
Military Science Minor		Military Science (Army ROTC)
Music (B.A.) Music Merchandising (B.A., B.S.)		Music
Music Education (B.M.E.)	Choral Instrumental General	Music
Philosophy Minor		Philosophy & Religion
Physics (B.S.)	Professional Science Teaching General	Physics

Political Science (B.A., B.S.)	Teaching Pre-Law Public Administration Criminal Justice General	Political Science
Printing-Education (B.S.) Printing-Journalism (B.S.) Printing-Management (B.S.) Printing Associate (2 year program)		Journalism & Mass Communication
Psychology (B.A., B.S.) Psychological Services (B.A., B.S.)	Applied Pre-Professional	Psychology
Religion Minor		Philosophy and Religion
Restaurant Management (B.A., B.S.)		Nutrition & Food Science
Sociology (B.A., B.S.)	General Teaching Social Work Human Services Criminal Justice Personnel Services	Rural Sociology
Speech (B.A., B.S.)	General Speech Theatre Speech Communication Mass Communication Communication Disorders Speech Education	Speech
Women's Studies Minor		All University Program
Zoology (B.S.)		Biology



## College of Arts & Science Degree Requirements

**General Studies Degree.** Dr. Edward Hogan, Coordinator. Students may pursue either the B.A. or B.S. degree outside the confines of a normal departmental major. This allows students to construct a program of advanced courses that meet their special needs. Entrance into the program is normally during a student's sophomore year. Permission to begin the program must be obtained from the General Studies Coordinator. All university and college graduation requirements must be met along with the specific program requirements developed by the adviser and student.

Bachelor of Science Degree	Semester Hours
Fr Comp, Engl 101 .....	3
Junior Comp, Engl 300.....	3
Fund of Speech, SpCm 101 .....	3
Fitness & Lifetime Activities, PE 100, 2 semesters .....	2
Mathematics.....	3
Humanities (from approved university list p.15; from at least 2 disciplines).....	6
Natural Science (from approved university list including two courses in sequence, list on p.16)	
Biological Sciences.....	6
Physical Sciences.....	8

Social Sciences (from approved university list, p.16; from at least 2 disciplines).....	9
Humanities (see general requirement #1 below).....	3
Social Science (see general requirement #1 below).....	3

Bachelor of Arts Degree	Semester Hours
Fr Comp, Engl 101 .....	3
Junior Comp, Engl 300.....	3
Fund of Speech, SpCm 101 .....	3
Fitness & Lifetime Activities, PE 100, 2 semesters .....	2
Mathematics.....	3
Foreign Languages* (in 1 language unless approved by head of Foreign Lan- guages Department) .....	14
Humanities (from approved university list p.15; from discipline other than a foreign language).....	3
Natural Sciences (from approved university list including two courses in sequence, list on p.16) .....	8
Social Sciences (from approved university list, p.16; from at least 2 disciplines).....	9
Humanities (see general requirement #1 below).....	3

Social Science (see general requirement #1 below)..... 3

\*International students whose native language is not English may substitute 14 credits in 'American Culture' courses for the foreign language requirement. These courses in the humanities and social sciences are in addition to the normal B.A. requirements. Students must visit with the Student Academic Affairs Coordinator in the Dean's Office in the College of Arts and Science for permission to follow this option and to obtain a list of specific requirements.

Bachelor of Music Education Degree	Semester Hours
Fr Comp, Engl 101 .....	3
Junior Comp, Engl 300.....	3
Fund of Speech, SpCm 101 .....	3
Fitness & Lifetime Activities, PE 100, 2 semesters .....	2
Mathematics.....	3
Humanities (from approved university list, p.15; 8 hours of Foreign Language recommended; 5 hours must be in discipline(s) other than music).....	11
Natural Sciences (from approved university list including two courses in sequence, list on p.16) .....	8
Psychology 101.....	3
History 368 or Anthropology 421 .....	3
Social Science (from approved university list, p.16).....	3

# General Requirements

All general university requirements must be met to qualify for the bachelor degrees in the College of Arts and Science. In addition the following special requirements have been established:

- (1) For 3 credits in both the humanities and social sciences in the B.A. and B.S. degrees in the College of Arts and Science students may take courses listed in the university core (p.15-16) or any courses not listed in the university core in the following Arts and Science Core listing. **Humanities:** Any course in the following departments; Art, Music, English, Philosophy and Religion, or courses prefixed with Theater (in Speech) or Dance (in HPER). **Social Sciences:** Any course in the following departments; Psychology, Geography, History and Political Science.
- (2) 40 semester credits of the 128 total required for graduation must be upper division (300 and above) credits.
- (3) No more than 6 credits in one discipline may be counted toward the humanities or social science core requirements for any College of Arts and Science degree.
- (4) 6 credits must be taken in the area of International Studies. These courses may duplicate humanities or social science core courses.

The list of courses that count toward the International Studies requirement are listed below. Courses marked with an asterisk (\*) are also part of the university core as listed on pages .

## Humanities and Fine Arts

**Art:** ArtH 100\*, Art and Design Appreciation; ArtH 211\*, Survey of World Art and Architecture; Art H 212\*, Western Traditions in Art and Architecture; and ArtH 412\*, Studies in Modern or Contemporary Art and Design.

**English:** Engl 213\*, World Literature Through the Renaissance; 215\*, Modern World Literature, 321\*-322\*, English Literature.

**European Studies:** EurS 300\*, Topics in European Culture.

**Foreign Languages:** MFL 134\*, Foreign Cultures; All other courses except MFL 420.

**French:** Fren 101\*, 102\*, 201\*, 202\*; All other courses.

**German:** Germ 101\*, 102\*, 201\*, 202\*; All other courses.

**Spanish:** Span 101\*, 102\*, 201\*, 202\*; All other courses.

**History:** Hist 121\*-122\*, History of World Civilization; Hist 322\* Ancient History.

**Latin American Area Studies:** LAAS 301\*, Latin American Cultures; 401, Directed Studies in Latin American Cultures.

**Music:** Mus 230\*, Music History and Literature III; 231\*, Music History and Literature IV\*.

**Philosophy:** Phil 312\*, Great Ideas of the Western World; 423, Political Philosophy; 424, Modern Political Theory.

**Religion:** Rel 338\*, World Religions.

## Social Science

**Anthropology:** Anth 320\*, Cultural Anthropology.

**Economics:** Econ 405, Comparative Economics Systems.

**European Studies:** EurS 301\*, Topics in European Society.

**Geography:** Geog 200\*, Introduction to Human Geography; Geog 210\*, World Regional Geography; 313, Geography of Latin America; 314, Geography of USSR; 315, Geography of Europe; 316, Geography of Asia; 317, Geography of Africa.

**History:** Hist 310, Topics in Latin American History; 325, Medieval History; 326, Renaissance & Reformation; 327, Early Modern Europe; 330, Topics in European History; 342, English History; 345, History of Russia; 417, History of Latin America; 418, History of Latin America; 421, Contemporary European History 422, Contemporary European History; 447, Modern Germany.

**Political Science:** PolS 253\*, Current World Problems; 265\*, Political Ideologies; 341, European Democratic Government; 343,

USSR; 345, Canada; 347, Latin American Politics; 351, International Politics; 356, International Law and Organizations; 446, China and Asian Politics; 448, Politics of Middle East and Africa.

- (5) The requirements of one of the College of Arts and Science departmental majors must be met. Specific requirements are listed under each department. Courses taken in the major subject may be used to fulfill university core requirements if the department allows it.
- (6) General examinations during the freshman, sophomore and/or senior year and an exit examination in a student's major field are required for graduation.
- (7) The curriculum printed in the catalog at the time a student enrolls in the college will normally, but not always, be the curriculum required for graduation.
- (8) Upon recommendation of the dean and the departmental head, students may be required to change their major if the quality of work is considered unsatisfactory. Less than a "C" average in courses in the major will be regarded as unsatisfactory unless departments have established another standard.

## Elective Courses

Students in most majors are allowed to choose a substantial number of elective courses. In many cases students choose to take a second major or take courses in one or two minor areas. Students in the B.A. or B.S. in the College of Arts and Science have the option of enrolling in up to 12 credits of unpenalized electives. (See Unpenalized Electives on page 19.)

Students planning to teach high school should start taking professional education courses during their sophomore year. Students must apply for admission to the supervisor of student teaching before being admitted to the education sequence. (See the Education Division for further details.)





---

---

# Education

Darrell Jensen, Dean  
Box 2220  
Brookings, SD 57007-0095

---

---

## Education (Ed)

---

### Division of Education

The Division of Education's chief purpose is teacher training in the following areas:

Agriculture, Art, Biology, Chemistry, Economics, English, Foreign Language — French, German, & Spanish, Geography, Health & Physical Education, Coaching, History, Home Economics, Journalism, Mathematics, Music — Instrumental & Vocal, Physics, Political Science, Printing, Psychology, Sociology, & Speech.

There are special graduate programs for those who wish to prepare for counseling and guidance work in schools and related counseling fields, for teaching and for school administration.

SDSU has been appointed for vocational agriculture teacher training by the State Board of Education. The office administers vocational education under the provisions of the Vocational Education Amendments of 1976, providing federal aid for such work.

### Governance of Teacher Education

The Dean of Education is responsible to the Vice President for Academic Affairs for the general administration and coordination of the teacher education program. In this governance, the Dean is assisted by the Council for Undergraduate Teacher Education. The Council is chaired by the Dean of the Division of Education. Council membership consists of five (5) Division of Education faculty, one (1) faculty member from each of the following areas: Agricultural Education, Home Economics Education, Music, HPER, Humanities, Natural Sciences, Social Sciences, and Fine Arts, and two (2) Teacher Education students.

### Accreditation

The division is accredited by the National Council for Accreditation of Teacher Education. NCATE is an independent, autonomous, voluntary accreditor of teacher education programs. The most recent accreditation by this agency was 1985. Also

the division has been approved by the South Dakota Division of Education. The last visit of the state agency and the granting of approval occurred during the spring of 1985.

### Objectives

The objectives for the division are to:

1. Prepare you for the teaching profession in secondary schools.
2. Provide for the continuing growth of teachers, school administrators, and other school service personnel through summer school sessions and extension courses.
3. Provide course work at the graduate level especially designed for school administrators, counselors, classroom teachers, specialized school workers, and related occupations.
4. Cooperate with the South Dakota Division of Education in public school curriculum revision, in-service education, and educational research.
5. Cooperate with professional education organizations in advancing the welfare of education in the state.
6. Organize and conduct conferences and workshops for the improvement of education in South Dakota.
7. Provide consultant services to schools of the state when they are appropriate to the needs of the particular school.

### Organizations and Honor Societies

The students in the various education programs are encouraged to be active members of their professional organizations.

**Alpha Tau Alpha:** An honor society in Ag Education. Requirements for membership are 3.0 GPA and at least sophomore level.

**Agricultural Education Club:** To develop an interest in agricultural teaching. Open to all students in Ag Education.

**Collegiate Future Farmers of America:** Open to former members of high

school FFA Chapters and others interested in maintaining FFA affiliation.

**Kappa Delta Pi:** An honor society that recognizes outstanding contributions to education. Members must be at least junior level with a 3.0 GPA.

**Student National Education Association.** To develop an appreciation of education and stimulate student interest in education. Membership is open to all students in education.

**Phi Delta Kappa:** An international professional organization dedicated to quality research, service, and leadership in education. Membership is open to persons engaged in the field of education and graduate students in education.

### Admission to Teacher Education

If you desire admission into professional courses in education for the purpose of earning a teaching certificate you must fulfill the following requirements:

1. Demonstrate proficiency in speaking, writing, reading and mathematics.
2. Complete a practicum experience in education in their sophomore year.
3. Possess an overall graduation ratio of 2.5.
4. Complete an application process in Practicum. If you have not filed an application in Practicum, an appointment should be made with the Supervisor in Agricultural Education, the Division of Education, or Home Economics Education.

An Institutional Review Committee will respond to requests for waiver of admission requirements.

### Preparation for Teaching

You should have personal attributes and interpersonal skills appropriate for working with people. It is also essential that you have an adequate general education background, usually attained in the first two years of college, along with a specialized

background gained through at least one major and one minor area of study.

You should major in the subject you expect to teach and you must complete prescribed courses needed for certification.

The South Dakota Division of Education, in issuing the teacher certificates, reviews subject matter background and professional education courses taken by the candidate.

Teaching majors and minors are generally chosen from college majors and minors. The required education and psychology courses do not count as credits in the major or minor but are requirements for the teaching certificate. Because of the nature of the work of the high school curricula in small and medium sized high schools, a more general preparation of teachers seems desirable. Since teachers may expect to teach in more than one area of specialization, minors, along with the major, can enhance their preparation.

For example, in science teachers should plan their preparation for all typical subjects in taught science in secondary schools, rather than in just one specific science area in science. In social studies, teachers should plan their preparations for various areas in social studies rather than just one special area such as history or sociology. It is also

advisable for teachers to acquire expertise in directing one or several extra-class activities.

**Student-teaching:**

You should plan to complete the professional semester during the first or second semester of the senior year.

You should contact the appropriate Supervisor of Clinical Experiences during the junior year to make arrangements for placement in a school for student teaching.

To be qualified for student teaching, you must meet the following qualifications:

1. Possess a 2.5 overall graduation ratio.
2. Possess a 2.6 overall graduation ratio in the major area of study.
3. Possess a 2.6 graduation ratio in professional education courses.
4. Have demonstrated competencies in speaking, writing, reading and mathematics.
5. Be recommended by the department in which you are majoring.

An Institutional Review Committee will respond to requests for waiver of requirements.

The student-teaching semester includes required course work in education and student teaching. You should not plan to enroll

in additional courses or become involved in campus activities or outside employment that would conflict with student teaching or education block responsibilities. Centers for student teaching are located throughout the region. You should be prepared to move to a center for the student teaching experience.

**Exit Standards:**

To be eligible for recommendation for certification, upon graduation, you must meet the following criteria.

1. Possess a 2.5 overall graduation ratio.
2. Possess a 2.6 overall graduation ratio in the major area of study.
3. Possess a 2.6 graduation ratio in professional education courses.
4. Complete student-teaching with a satisfactory grade and a satisfactory recommendation.
5. Complete the National Teachers Examination.

**Curricula for Teachers of Special Areas**

The curricula for special groups such as Agricultural Education, Home Economics Education, and Physical Education are found elsewhere in this bulletin (see index).

## Teaching Minors for Students in Teacher Education

Frequently students in the teacher education program complete a combination of courses that constitute a minor. These would be courses not included in a student's major. For detailed information consult with the Dean of the Division of Education who is the minor adviser. These minors are listed below:

**Social Science Minor**

The minimum requirements for a Social Science Minor at South Dakota State University is 24 credit hours. The student must have an emphasis in two of the three following subject areas:

- American History - Hist. 251, 252, elective ..... 8
- American Government - PolS 100, 102, 210..... 9
- Geography - Geog 200, 210, elective ..... 9

A student may choose the remainder of the credits from the following subject areas:

- Economics - Econ 201, 202, elective
- Psychology - Psych 202, 262, elective
- Sociology - Soc 150, 301, 310
- World History - Hist 121, 122, elective

**Language Arts Minor**

- Fr & Junior Comp, Engl 101, & 300..... 6
- English electives ..... 7
- Fund of Speech, SpCm 101 ..... 3
- Speech electives ..... 3
- Newsriting & Reporting, MCom210..... 3

Journalism elective ..... 2

**General Science Minor\***

- Biology, Bio 151, & 153..... 6
- Intro Physics, Phys 101 & 103 or 111 & 113 ..... 7
- Gen Chem, Chem 110 & 120 or 112 & 114..... 7
- Electives..... 4
- Any physical geography course
- Intro Entomology, PS 105
- Avatomy, Zool 221
- Plant Kingdom, Bot 201
- Environmental Conservation, WL 363
- Climatology and Meterology, AE 353
- Geology, PS 243
- Intro Oceanography, Bio 353

**Biological Science Minor.\***

- Biology, Bio 151-153..... 6
- Genetics, Bio 371 ..... 3
- Prin of Ecology, Bio 211 ..... 3
- Cell Biology, Bio 343..... 3
- Electives in Botany, Zoology, Biology, Microbiology, or Wildlife..... 9

**Physical Science Minor\***

- Elem Physics I-II, Phys 111-113..... 8
- Atomic Physics 331 ..... 3
- Chemistry, Chem 112, 114..... 8
- Elem Organic Chem, Chem 120..... 4
- Physics elective.....

\*Strategies in Science Teaching, SeED 416 — strongly recommended as an elective for all science teaching minors.

Some schools hiring teachers place their local requirements above the minimum set by the South Dakota Division of Education and the North Central Accrediting Association.

Those planning to teach should consult the dean of the division, division staff members, and advisers in college major and minor departments early in the junior year for more detailed interpretations of these regulations.

**Teaching Certificates**

Teaching certificates in South Dakota are issued by the South Dakota Division of Education. The secondary certificate qualifies the holder to teach subjects in grades 7-12. The certificate states the subjects or subject groups in which the teacher may teach.

**Placement Service**

Placement for graduates and former students of the university who are prepared to teach is provided by the placement service. The placement service also serves local school officials by helping them contact qualified teachers. There is an enrollment fee.

**Graduate Study in Education**

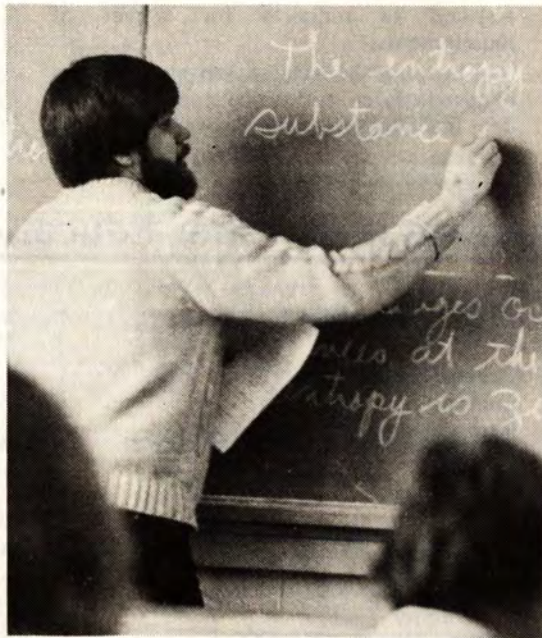
The Graduate Program in Education is designed to provide professional preparation beyond the Bachelor's degree. The program includes the following options.

- (1) Agricultural Education
  - (2) Educational Administration
  - (3) Counseling, Guidance and Personnel Services
  - (4) Teacher Education
- For further information consult the graduate bulletin.

For a statement of specific requirements for the different administrator's certificates, the student should write the South Dakota Division of Education or consult with the Dean of the Division of Education.

## Education Curriculum for Teachers of Academic Subjects

<b>Sophomore Year</b>	<b>F</b>	<b>S</b>	History of American Indians, Hist 368 or Indians of North America, Anth 421.....	3 or	3	Audio Visual Methods & Materials, SeEd 405..... Second Half of Semester:	2 or	2
*Gen Psychology, Psyc 101.....	3 or	3				Supervised Student Teaching in Sec Schools, SeEd 488.....	8 or	8
Practicum & Professional Laboratory Experiences, SeEd 287.....	2 or	2	<b>Senior Year</b>					
			First Half of Semester:	<b>F</b>	<b>S</b>			
<b>Junior Year</b>	<b>F</b>	<b>S</b>	Ed Measurements, EdER 415.....	2 or	2	*General Psychology is a prerequisite to education courses but does not count as education credits for the teaching certificate. In order to complete the Education Curriculum as outlined above, the prospective teacher should take Psychology 101 and SeEd 287 in the sophomore year. The student should start education courses in the fall semester of his/her junior year.		
Intro to Am Education, EdFn 339.....	2 or	2	Methods of Teaching in Sec Schools, SeEd 400	3 or	3			
Computers in Teaching, EdFn 385.....	2 or	2	Prin of Guidance, CGPS 410.....	2 or	2			
Ed Psychology, EPsy 302	2 or	2						
The Teaching of Reading, SeEd 450.....	3 or	3						



---

---

# Engineering

Ernest L. Buckley, Dean  
Box 2219  
Brookings, SD 57007-0096

---

The College of Engineering offers a variety of courses by a thoroughly competent faculty, characterized by academic attainment and significant accomplishments in engineering practice. Undergraduate professional programs are offered leading to baccalaureate degrees in Agricultural Engineering, Civil Engineering, Electrical Engineering and Mechanical Engineering. Undergraduate programs are also offered leading to the baccalaureate degree in Technology, in Computer Science and in Engineering Physics. In addition to the undergraduate degree programs, course selections are available from the broad offering of undergraduate courses in general engineering specializations. The professional programs in engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

The College of Engineering offers courses at the pre-engineering and professional engineering levels. Broadly speaking, pre-engineering includes those engineering courses listed for the freshman and sophomore years in the course sequences for the baccalaureate degree programs. The professional offerings include courses in the respective accredited sequences for the junior and following years. Through General Engineering, courses of application to all of the professional disciplines are offered. These include engineering graphics, engineering shops, mechanics, and economics. Computer aided design and computer aided manufacturing instruction is also offered in General Engineering.

The Bachelor of Science degree in Technology is a program administered by the General Engineering department. You may choose to major in Electronic Engineering Technology rather than in Electrical Engineering, for example.

High technology emphasis is provided through the Bachelor of Science degree program in Engineering Physics. Computer Science is an option open to a limited number of students with a grade point average of 2.75 or better.

## Goals for Engineering

The engineering program endeavors to develop the ability to apply logical thought

and rational actions to the identification, description, and solution of problems. If you are a mature student who aspires to contribute to the solution of society's problems you are invited to consider the liberal range of the engineering and technology programs.

As an engineering student you are required to have credit for 27 hours of courses in the liberal arts, at least 13 hours in science, 15 hours or more in mathematics beyond trigonometry and a selection of courses from a number of areas in engineering in order to graduate. In addition, you may elect courses from the offerings of the other Colleges of the University.

## Opportunities in Engineering

Engineering efforts of ever increasing magnitude will be required if our society is to continue to support a growing population. Thus the demand for engineers and technologists will grow in a number of challenging areas.

The search will continue for energy conversion processes that meet the requirements of little pollution, high efficiency, and low price. The elimination of waste contamination of land, air and water is a major materials handling and processing problem that will challenge the best engineers.

The ever-growing needs for better forms of housing, transportation, health care, and community planning are inhibited by engineering problems of immense proportions.

International competition has come to threaten the technical leadership of the United States. It is the responsibility of engineers and technologists to face the challenges in creativity and management that will serve as an example to the rest of the world.

Technologists are in demand as the operations supervisors, the quality control specialists, planners, and ultimately as the factory managers, technical sales persons and the process controllers.

The many needs of engineering in the research, development and production and sales facets of the commercial market are relatively unchanging. Graduate study in engineering is essential, however, as the technical problems that we face become more

complex. Opportunities have long existed for engineers with advanced degrees. The Master of Science in Industrial Management is a graduate program of appeal to both engineers and technologists. New opportunities grow as graduate schools of business, medicine, and law discover that their better students often have engineering baccalaureate degrees. Good engineering students are actively recruited by these other professional schools.

## Preparing for the Engineering Curricula

Engineering achievement rests heavily upon a foundation of mathematics and science. Furthermore, the successful practice of engineering demands, as a primary requisite, the ability to communicate facts and ideas. The engineer must comprehend and present ideas with precision and clarity. The prospective engineering student therefore, should prepare by the proper selection of courses in junior high and senior high school. It is desirable that you present high school credits as follows: four years of English, one year of graphics (mechanical drawing, etc.), one year of physics, one year of chemistry, and four years of mathematics including two years of algebra, one year of geometry and one-half year of trigonometry. If you do not have these courses you may still enroll in the College of Engineering, but you should recognize that it may lengthen the duration of your program. (See admission requirements of the University).

## Admission

**Pre-Engineering** — you may be admitted to the Pre-Engineering Program or in the Technology Program of the College of Engineering upon meeting the admission requirements established by the University and the College of Engineering. You may identify the accredited professional program of your choice so that your faculty adviser will be selected from that department; or, if you are undecided, you may simply enroll in General Engineering.

As a pre-engineering student you must have a GPA of at least 2.0 or you are not permitted to register or to receive credit for professional-level courses in engineering.

As a pre-engineering student with a GPA of at least 2.0 you may (with the permission of the major department chairman) enroll for junior level courses in engineering if, during that semester, you are also enrolled for those courses necessary to complete pre-engineering requirements. In general, no pre-engineering student will be allowed to receive credit for more than 21 semester hours of professional-level courses and no pre-engineering student will be allowed to receive credit for any senior-level engineering course.

If you aspire to the Bachelor of Science in Technology program, you must meet similar requirements for academic performance. You may progress directly from the sophomore level to the upper level courses in the technology curriculum.

If as a technology student, you were to decide to change to one of the professional engineering programs, you would consult with your adviser, make-up any deficiencies, then apply for entry to the Professional Engineering program.

Vocational technical school graduates can apply for admission to the Technology program. Evaluation of your vo/tech transcript may result in substantial allowance of college credit applicable to the Bachelor of Science in Technology degree.

In addition to the requirements imposed by the University, if you are an international student, the College of Engineering requires that you score at least 450 on the math portion of the SAT.

If you are not working toward an engineering degree and if you meet the course prerequisites you may register for any course offered in General Engineering.

If you are a non-engineering student, enrolled in another College of the University or in another institution you may be admitted to the College of Engineering provided that you meet admission requirements described above. Qualified students will enter as pre-engineering majors.

**Professional Engineering** — In order to gain admission to any of the accredited baccalaureate professional programs of the College of Engineering, you must be nominated by the Department administering that program.

The minimum grade-point averages for admission to the professional program are 2.0 average overall and a combined average in the required engineering, mathematics, and science courses as determined by the Department. The grade-point average used in this determination is calculated on the basis of all courses attempted which are applicable to the degree sought. However, limitations of faculty and facilities will also be used as a basis for determining the number of students to be admitted in any semester.

In the semester in which you expect to complete your pre-engineering require-

ments, you must apply to your major department for nomination to the professional program.

Nominations for admission into the professional programs are submitted by the student's major departments to the College of Engineering Council (Department Heads and other members appointed by the Dean of Engineering). Following its deliberations, the Council submits its recommendations to the Dean of Engineering who makes the final determination in regard to the disposition to be made of all nominations.

A student admitted to the professional engineering program who desires to change to a different engineering major enters the new major at the pre-engineering level. The student must then apply for nomination to the professional program in the new major.

**Other Programs** — If you are not admitted to a professional degree program you are encouraged to continue study in one or another of the alternative programs: Computer Science, Engineering Physics, Mathematics (administered by the College of Arts and Science), or the Technology program of General Engineering. Admission to those upper level programs may vary with specific Departmental requirements.

## Transfer Students

The College of Engineering welcomes students who transfer from other colleges. In some cases there are questions about equivalency of courses, and in such cases an inquiry to the Office of the Dean of Engineering is welcome. Prospective transfer students should note that there are certain engineering courses in the sophomore year that may not be available at another college, and that in some cases it is desirable to transfer before the completion of the sophomore year to avoid extending the time necessary to complete the degree.

If you are planning to transfer to or from SDSU you should realize that credits do not automatically transfer. Each university has its own requirements. South Dakota State University is free to apply these requirements in accepting transfer credits within regental policy.

The College of Engineering requires an overall grade point average (GPA) of 2.5 or better, at the time of transfer, and for admission to the accredited professional programs. You may transfer to General Engineering and its Bachelor of Science in Technology programs with a GPA of 2.0 or better. No department will accept transfer credits toward any degrees if the grade re-

## Engineering Curricula

Major Department	Options/Areas of Emphasis
Agricultural Engineering*	Electric Power & Processing Environmental Management Power & Machinery Structures & Environment Water Resources Engineering
Civil Engineering*	Environmental Sanitary Engr. Highway Engineering Hydraulics Engineering Foundations Engineering Structural Engineering
Computer Science	Computer System Design Software Development Data Processing Systems
Electrical Engineering*	Bioengineering Communications and Advanced Electronics Power Systems Remote Sensing
Engineering Physics	Nuclear Physics Solid State Systems Physics (College of Arts & Science)
Mechanical Engineering*	Aeronautics Environmental Engineering Heat-Power Engineering Industrial Engineering Machine Design Nuclear Engineering Thermal Engineering
General Engineering	Pre-Architecture Electronics Engineering Technology

\*Professional Program accredited by the Engineering Accreditation Commission of the Accrediting Board of Engineering Technology

ceived at your previous institution was lower than a C, even though these grades are counted in your GPA to determine admission to SDSU and are entered on your transcript. Each department will decide at the time credits are transferred, whether or not a course taken at any other institution is equivalent in content and difficulty, and whether or not it should be accepted. As an SDSU engineering student planning to take courses at another institution, for subsequent transfer here, you should consult with the Department Head, before leaving SDSU, to determine if those courses will be accepted.

SDSU requires you to complete at least 32 credit hours in residence to receive a degree. Also, a minimum of 20 of these credits must be in junior-and-senior-level (300 and 400) courses taken immediately preceding the awarding of the degree. The College of Engineering further specifies that these 20 credits must be taken in the engineering department at SDSU from which you expect to receive your degree.

### Counseling

You are assigned an academic adviser from the Department administering your

chosen field of study. Advisers assist in planning course work and will cooperate in the general university counseling and orientation program. Your adviser should be your best friend on the faculty. Any problems that you experience and that might be solved by competent mature advice should be referred to your adviser.

### Cooperative Plan

The College of Engineering offers assistance in placing you in cooperative programs with various industries in South Dakota or in surrounding states. Cooperative students gain practical experience in engineering during their college years, gain motivation for greater interest in their studies and provide themselves with a means of financing a college education. Such a program alternates between full-time study in college and full-time work periods in industry. Under this plan, the bachelor's degree may be earned in a period of time slightly in excess of five calendar years. Academic credit for participation in this program is available through a 494 course offered in each engineering department. You may enroll for a maximum total credit of between 1 and 6 credits. Permission to register for

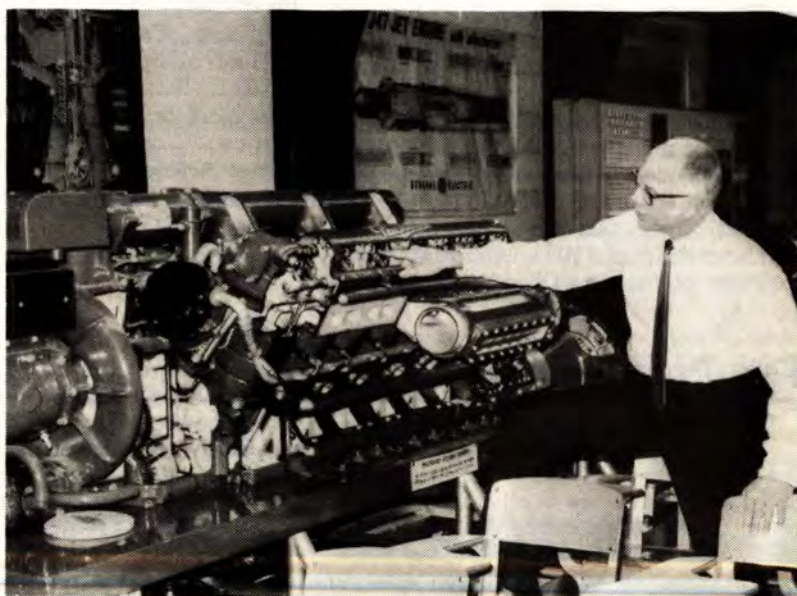
such credits must be obtained from the designated faculty coordinator in the department in whose discipline and under whose supervision the experience would be carried out. The coordinator establishes the academic requirements, evaluation criteria and grading procedures.

### Approved Humanities and Social Science Elective

As an Engineering Student you must satisfy the Regental core requirements of the University and the more rigorous requirements of EAC/ABET for depth in the Humanities and Social Sciences. Your chosen department will provide you with an approved list of courses. Refer to the section on Academic requirements in this catalog for details.

### Activities

As an Engineering student you are encouraged to participate in activities of the student chapters of the various engineering societies and in the professional society activity of the National Society of Professional Engineers and the South Dakota Engineering Society.



# General Registration

James O. Pedersen, Dean  
 Box 551  
 Brookings, SD 57006-1298

Students enrolling in the College of General Registration have elected to explore their abilities, interests and educational alternatives before declaring a major. SDSU offers more than 200 majors, minors and options and through General Registration

and the Career and Academic Planning Center, assistance is provided to help you make a wise major/career choice. The College of General Registration does not offer a degree program, it is designed for undeclared majors, pre-professional students

and those who simply want to take a variety of courses. By the time a student reaches junior class status, he/she should be enrolled in one of the degree granting colleges.

## No-Preference

General Registration allows you to begin college work without declaring a major.

If you enroll under this classification you are assisted by faculty advisers in planning a basic college program and are encouraged to explore various fields of study. Professional advisers in the Career and Academic Planning Center help you explore your interests, aptitudes and abilities.

Proposed freshman year schedules are shown below. These are suggested programs only. You would work with faculty advisers to plan a program to meet your own interests and needs. Normally, your interests are reflected in the choice between social science-oriented programs and science-oriented programs, and the elective courses you choose.

General Registration students should maintain at least a "C" grade average in

freshman and sophomore subjects. This is important in gaining admittance to a degree granting college. Students are permitted to enroll in the College of General Registration for two academic years.

Suggested Program	No-Preference	Social Science Oriented
<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp, Engl 101, and Fund of Speech, SpCm 101 .....	3	3
Biological or Physical Science .....	3-4	3-4
Social Sciences .....	3	3
Fitness & Lifetime Activities PE 100 .....	1	1
Career Exploration and Interest Areas .....	4-6	4-6

### Suggested Program No-Preference Science Oriented

Freshman Year	No-Preference	Science Oriented
Fr Comp, Eng 101 and Fund of Speech, SpCm 101 .....	3	3
Mathematics, Math 113, Algebra & Trigonometry, or Math 123, Mathematical Analysis I .....	5 or	5
Fitness & Lifetime Activities, PE 100 .....	1	1
Chemistry, 112-114 .....	4	4
Career Exploration & Interest Areas .....	3-4	3-4

## Pre-Professional

If you wish to qualify for admission to the professional schools of medicine, dentistry, optometry, law or others that require pre-professional education you would ordinarily start in the College of General Registration. One out of every fifteen entering SDSU freshmen intend to apply for entry to professional schools. SDSU is accredited by the North Central Association of Colleges and Secondary Schools; transfer credits are therefore normally accepted if satisfactory grades are maintained.

Requirements for admission to professional schools vary. Pre-professional courses required by all of these schools are, however, available on campus. Assistance

will be given to the students to assure them that they will meet the course requirements of the professional school they may select. Nearly all of the pre-professional school exams are now administered on campus.

Outlined below are suggested programs. Consult the catalog of the institution at which you may take advanced work for any changes that should be made in these programs. Catalogs for most of the professional schools are available in the Career and Academic Planning Center.

### Pre-Chiropractic

Candidates for admission to chiropractic colleges accredited by the Council on

Chiropractic Education are required to have a thorough grounding in the basic sciences — biology, chemistry, physics — as well as a general education in the humanities and social sciences.

You must complete at least 60 undergraduate credits to be considered for admission to chiropractic college. Approximately half of those accepted have baccalaureate degrees. Pre-professional training and academic standing of the applicants must meet the standards of the school selected.

A suggested curriculum includes:

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp, Engl 101 and Fund of Speech, SpCm 101.....	3	3
Gen Chemistry, Chem 112-114.....	4	4
Algebra, Math 111 and Plane Trig, Math 120 or Algebra and Trig, Math 113 and Math Analysis I, Math 123.....	3-5	3-5
Social Science and Hu- manities .....	6	8
Fitness & Lifetime Activi- ties, PE 100.....	1	1
<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
*Organic Chemistry, Chem 222-224.....	4	4
Intro Biology, Bio 151-153	3	3
General Psychology, Psyc 101.....	3	3
Elementary Physics, Phys 111-113.....	4	4
Electives*.....	2-3	2-3

\*Course requirements for your major and chiropractic college of your choice.) Complete junior composition, Engl 300, in the sophomore year if you plan to apply to chiropractic colleges after completing 60 credits. Other course recommendations for the junior and senior year include additional biology (Bio 343 Cell Biology, Bio 371 Genetics, or Bio 271 Heredity and Society) and additional chemistry. A course in vertebrate anatomy is also highly recommended.

#### Pre-Dental

Candidates for admission to dental schools usually have a rigorous undergraduate preparation. Subjects developing scientific curiosity and knowledge, such as chemistry, physics, biology and mathematics, should be taken, as well as those that develop personality, understanding of human relations, and general social awareness. The Handbook of Admission Requirements of American Dental Schools states:

"Because the dentist works and lives harmoniously with his colleagues and the public, courses which develop perception, discipline and sound judgment, as well as those of scientific nature, are essential at an early stage of education."

Dental schools in the U.S. require three years of college education, and most prefer baccalaureate degree candidates. The Council on Dental Education supports the trend in admission policies which encourages the acquisition of a baccalaureate degree prior to dental school enrollment.

There are basic pre-dental education subjects that must be completed prior to gaining admission to a dental school. Since dental schools vary as to the required pre-dental education subjects, it is recommended that the pre-dental student consult two or three dental college catalogs to determine specific entrance requirements. Many dental school catalogs are available in The Career and Academic Planning Center. If you specify a pre-dental program choice you will be assigned to a pre-dental adviser who will help secure additional information on the requirements for admission to a dental school of your choice.

Admission to dental college is highly selective. You should prepare to meet the requirements of two or three colleges of your choice. Above average grades are required in pre-dental courses. Students who fail to maintain a B average should be prepared to make alternate career choices.

Requirements for admission to all accredited schools of dentistry include credit for one full year of English, biology, physics, and inorganic chemistry, and organic chemistry. These are minimum basic requirements and the prospective dental student is well advised to surpass these requirements. Each year the percentage of students admitted to dental colleges has increased in the category of those having received the baccalaureate degree.

The outlined program for pre-dental students is intended to serve as a guideline to meet the requirements of most of the dental colleges in the U.S. Variations in the program may be arranged with the pre-dental adviser to meet the requirements of a particular school of the student's choice.

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp, Engl 101 and Fund of Speech, SpCm 100.....	3	3
Gen Chem, Chem 112- 114.....	4	4
Algebra, Math 111, & Plane Trig, Math 120; or Algebra & Trig, Math 113, & Math Analysis I, Math 123.....	3-5	3-5
Social Science electives.....	3	5
Fitness & Lifetime Activi- ties, PE 100.....	1	1
Humanities Electives.....	3 or	3
<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Chemistry, Chem 222, Fund of Organic Chem & Chem 224.....	4	4
Intro Biology, Bio 151-153	3	3
Psychology, Psyc 101	3	3
Gen Psychology.....		
Physics, Phys 111-113 El- ementary Physics, I and II.....	4	4
Electives.....	2-3	2-3

#### Junior Year and/or Senior Year

Plan courses according to your major and dental college catalog of your choice. Enroll in English 300 in Junior year to complete English requirements.

#### Pre-Law

The pre-law student should be involved in an undergraduate program which is intellectually challenging and which requires rigorous academic discipline. SDSU not only has a long tradition of academic excellence, but it also offers you rich and varied social, recreational, and religious opportunities.

The formal academic training for law includes, with few exceptions, four years as an undergraduate leading to a bachelor's degree and three years in law school. Entering students who are undecided as to major choice and desire to prepare for law school

may enroll in the College of General Registration. If you enroll under this classification you are assisted by a Pre-Law adviser in planning your courses of study. Entering students who have chosen a major and desire also to prepare for law school enroll in the college at SDSU that offers this particular major. They too can have a Pre-Law adviser assist them in planning course schedules.

No specific subjects are prescribed for law school admission. You may select any undergraduate major available at SDSU. Law schools welcome and encourage a variety of educational backgrounds among their students. Breadth and intellectual maturity are more important than particular subject matter. However, law schools do recommend that the pre-law curriculum be carefully selected.

A reasonable exposure to such subjects as political science, history, literature, English composition, economics, sociology and philosophy will provide a good background for the full appreciation of the law. An important skill in law school is writing ability so undergraduate courses that develop this skill should be stressed. Electives such as drama and theatre arts, debating, creative writing, and speech can help in sharpening those skills needed by a member of the legal profession. Finally, the discipline used in the study of science will help prepare the student for the rigors of the law curriculum. Moreover, a basic knowledge of the physical and biological sciences will often help in the cases the lawyer pleads.

The attorney must be a well-rounded individual with knowledge in more than law. Understanding the basic psychology of people and the philosophy behind the law, and to use the logic necessary to present a case are important.

All law schools require the Law School Admissions Test and most pre-law students take it during the undergraduate senior year. It is a nationwide, half-day test of general aptitude for undertaking law studies and for writing ability. The Pre-Law adviser has application forms and sample tests. The adviser also has general information on law schools and an extensive file of law school catalogs is available in the Career and Academic Planning Center.

#### Pre-Medicine

The Handbook for Medical School Admission Requirements emphasizes "the major function of undergraduate education is to aid in the development of perceptive knowledgeable citizens."

This handbook also points out that a career in medicine requires individuals with a diversity of educational backgrounds and wide variety of talents and interests.

Students preparing for medical careers should recognize the desirability of broad education and the need for a basic understanding of the natural sciences, including



mathematics, chemistry, biology and physics. Prospective students seeking admission to a school of medicine should recognize that highly developed communication skills and a basic understanding of the social sciences and the humanities is necessary. Although most medical schools require a minimum of three years of college study, today most students admitted to medical school have a bachelor's degree. If you have indicated pre-medicine as your immediate objective you are assigned a faculty pre-medicine adviser. This adviser will have available requirements for all medical schools in the U.S. Pre-medicine students are encouraged to prepare to meet the entrance requirement for several medical schools of their choice. The pre-med adviser will help you with course selection within the framework of the four-year program outlined below.

When pre-med students select a major in one of the degree-granting colleges of the university, they are assigned a faculty adviser from this department and may additionally choose to keep their pre-med adviser. Regardless of the major students choose to obtain the baccalaureate degree, if they are interested in gaining admission to a medical college, they should make certain that they meet all of the specific subject requirements.

The pre-med adviser will explain the American Medical College Application Service (AMCAS) and assist students in their application process. Students entering the pre-medical program should plan a four-year course to include the requirements for admission to medical schools of his or her choice as well as provide alternative career objectives. In recent years, SDSU students have been successful in gaining admission to medical schools when compared to national averages.

#### Pre-Medicine

Freshman Year	F	S
Chemistry, Chem 112-114	4	4
Intro Biology, Bio 151-153	3	3
Algebra, Math 111, & Plane Trig, Math 120; or Algebra & Trig, Math 113; & Math Analysis I, Math 123.....	3-5	3-5
Fr Comp, Engl 101, and Fund of Speech, SpCm 101.....	3 or	3
Fitness & Lifetime Activities, PE 100.....	1	1
Intro to Sociology, Soc 100.....	3	

Sophomore Year	F	S
Physics, Phys 111-113 Elementary Physics I and II; or Phys 211-213, Gen Physics I and II.....	4	4
*Humanities Elective or Foreign Language if required by Medical School of your choice...	3-4	3-4

History.....	3-4
Psychology 101, Gen Psyc.....	3
Chem, 232 Quantitative Analysis.....	4
Anatomy, Zool 221.....	3
Biology Elective.....	3

Junior Year	F	S
Organic Chem 222-224.....	4	4
Literature, English, Am or World.....	3	3
*Humanities Elective or Foreign Language if required by Medical School of your choice...	3	3
Junior Comp, Engl 300....		3
Elementary Biochem, Chem 260.....		4
Electives.....	2-3	

#### Senior Year

Complete requirements for your major.

Electives to be chosen from junior and senior courses in such courses as philosophy, language, economics, political science, history, English, sociology or psychology.

Natural science electives may include Computer Programming, CSc 271; Embryology, Zool 383; General Microbiology, Micr 231; Mammalian Physiology, Zool 325; and Genetics, Bio 371.

\*Consult with Medical School of your choice whether foreign language will be required.

#### Pre-Ministerial

Almost all theological seminaries require some undergraduate education. Most require a college degree. On this pre-professional level, a broad general education is desirable. A satisfactory pre-ministerial program could be: the university core curriculum; selection of a major in any humanities or social science area; focusing electives around a core of religion and philosophy courses as selected from the more than 30 hours available in these areas. An additional option would be the major in Child Development: Child and Family Services Option with a Religious Service Concentration.

#### Pre-Mortuary Science

To meet the requirements as a mortician, funeral directors need specialized training. All states require those who embalm to be licensed. This field may require up to four years of course study of which at least one, or possibly two years, may be taken at this university. Also necessary is specialized training in an accredited school of mortuary science, and an apprenticeship in an approved funeral home. The curriculum

listed below may be altered to meet your needs, depending on the licensure requirements of the chosen state and the school of mortuary science you plan to attend. There are about 20 accredited mortuary colleges in the United States.

The diversity of funeral service makes it possible to successfully use nearly any academic major as a background. However, it should be noted that the education of the individual should be as diversified as the profession which you will serve. Leaders of the funeral service field are rapidly recognizing the need for educating the total person. Technical knowledge and the techniques for making a living are not sufficient in our complex society. Because the funeral director's work is a people-centered activity, you must draw upon the knowledge of sociology, psychology, as well as scientific fields, and the artistic areas which the technical needs of the profession require.

Students planning to be licensed in South Dakota must complete 60 semester credits and specific courses. Listed below is a suggested program for the sophomore year.

Freshman Year	F	S
Fr Comp, Engl 101, and Fund of Speech, SpCm 101.....	3	3
Gen Chem, Chem 112-114.....	4	4
Intro Biology, Bio 151-153	3	3
Gen Psychology, Psyc 101.....	3 or	3
Intro to Sociology, Soc 100.....	3 or	3
Fitness & Lifetime Activities, PE 100.....	1	1
Electives.....	3 or	3
Sophomore Year	F	S
Accounting, Actg 210-211 Prin of Actg I & II.....	3	3
Math, Math 111, Algebra, or Math 113, Algebra and Trig.....	3-5	3-5
Anatomy, Zool 221.....	3	
Mammalian Physiology, Zool 325.....		4
Junior Comp, Engl 300....		3
Prin of Econ, Econ 201...	3	
Electives (from Art, Music, Humanities, Theatre Arts, Literature).....	3-4	3-4

#### Pre-Optometry

There are 12 American colleges of optometry accredited by the Council of Optometric Education of the American Optometric Association. Students usually have completed three years of college work and about 75 percent of all students entering professional schools of optometry have completed their work for the bachelor's degree. You are encouraged to do this if at all possible.

The prospective optometric student should begin as early as possible to acquire an education in the fundamental sciences

with the proper selection of pre-professional courses. You may transfer from pre-optometry to the professional college spending at least three to four years in the optometric school or college.

The average GPA for successful applicants is now 3.0 (B average) or above for most colleges of optometry. Required courses include physics, mathematics, English, biological science, comparative anatomy, chemistry and psychology. The program outlined below will meet the general requirements of most professional schools of optometry within two years and provide a good background for the Optometry College Admissions Test. Certain optometry colleges may also require more credits in the humanities and social sciences.

Most of the accredited colleges of optometry, now require an Optometry College Admission Test, prepared and given by the Psychological Corporation at least three times each year. Your Pre-Optometry adviser can give you information on the Optometry College Admission Test, when it is given, and assist you in making the necessary application.

Students graduating from SDSU with above average grades and optometry test

scores have been very competitive in the Admissions process.

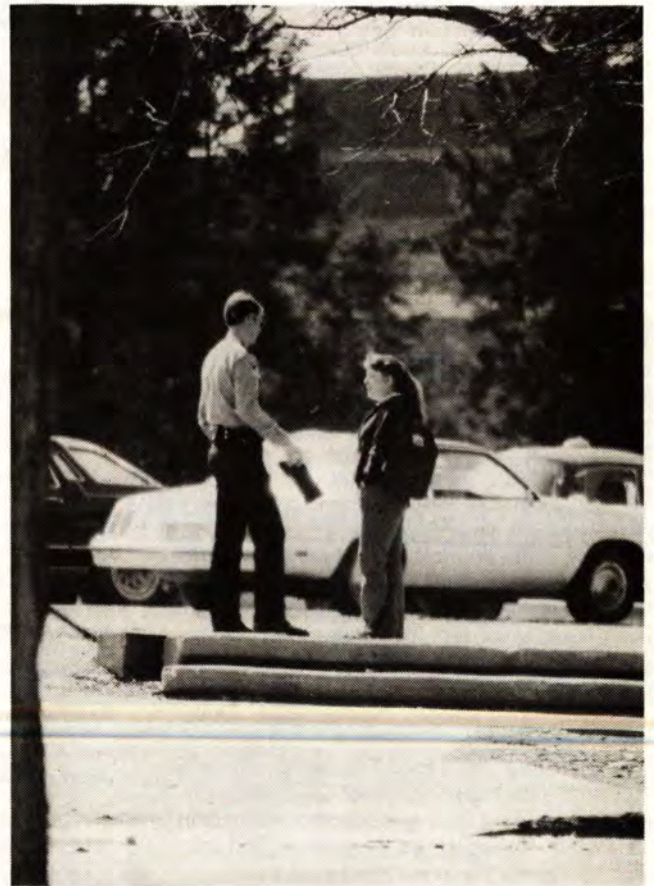
<b>Freshman Year</b>		F	S
Fr Comp, Engl 101, and Fund Speech, SpCm 101.....	3	3	
Intro Biology, Bio 151-153	3	3	
Mathematics, Math 111, Algebra, Math 120 Plane Trig; or Math 113, Algebra & Trig, or Math 123, Mathematical Analysis I.....	3-5	3-5	
Gen Psychology, Psyc 101.....	3		
Fitness & Lifetime Activities, PE 100.....	1	1	
Anatomy, Zool 221.....		3	
Gen Chem, Chem 112-114.....	4	4	
Humanities elective.....	3-4	3-4	
<b>Sophomore Year</b>		F	S
Organic Chem, Chem 120 or 222; Chem 224 if Chem 222 was chosen..	4	4	
Physics, Phys 111-113 Elementary Physics I & II, or Phys 221-213, General Physics I & II...	4-5	4-5	

Junior Comp, Engl 300....		3
Statistics, Stat 211 or Stat 341.....		3
Electives — Soc 100; Am Gov't, PoIS 100 or 101, Intro to Philosophy, Phil 205; Community Health, Hlth 102; Elementary Biochem, Chem 260; Genetics, Bio 370; Gen Microbiology, Micro 231.....	4-6	4-6

**Junior-Senior Year**  
Complete requirements for your major.

#### Other Pre-Professional Programs

Two pre-professional programs are administered in the College of Agriculture and Biological Sciences. These are Pre-Forestry and Pre-Veterinary. Pre-Forestry studies are arranged by the Department of Horticulture, Forestry, Landscape and Parks; and Pre-Veterinary studies by the Department of Veterinary Science. Students in these programs are assigned academic advisers from these departments. A suggested curriculum for each program is given in the College of Agriculture and Biological Sciences section of this catalog.



# Home Economics

Edna Page Anderson, Acting Dean

Box 2275A

Brookings, SD 57007-0097

The nucleus of Home Economics is the family ecosystem: 1) the study of the inter-relationships of food, shelter, clothing and interpersonal relations as they effect the individual and the family; and 2) the interaction of the family with other social systems and with the physical environment.

The College of Home Economics works within the structure of the University's goals to:

- 1) prepare professionals to enter the field of Home Economics as generalists or as specialists in areas of food, shelter, clothing and human development.
- 2) contribute to the general education of all students at South Dakota State University.
- 3) provide services to families, non-professional and professional groups throughout South Dakota.
- 4) perform research to benefit families and further the economy of the state.
- 5) provide a viable graduate program that leads to a Master of Science degree in Home Economics with concentrations in Child Development, Home Economics Education, Nutrition and Food Science or Textiles, Clothing and Interior Design.

The College is organized into four departments offering 11 options or major areas of study:

## Department of Child Development and Family Relations

The Child and Family Services option is for those interested in working in 1) social work agencies which deal with children, adoption and other family-related problems; 2) religious services; 3) hospital work with children; and 4) community service agencies as YM/YWCA, Girls/Boys Clubs, Scouting.

The Early Childhood Education option is approved for nursery school teacher certification. Students are prepared for careers in Day Care management, Head Start and similar programs for pre-school children.

## Department of Home Economics Education

Three major areas of Home Economics are administered through this department, Education, Extension, Journalism.

Graduates of the Home Economics Education programs qualify for secondary teaching certification in Vocational Home Economics: Consumer Homemaking and Home Economics Related Occupations.

A major in Home Economics Extension prepares students to work with the Cooperative Extension Service as extension home economists or as area specialists.

Home Economics Journalism is for those who are interested in journalism positions with business and government which require persons with a combined knowledge of journalism and home economics.

A minor in Home Management and Consumer Studies is available through the Home Economics Education Department.

## Department of Nutrition and Food Science

Areas of emphasis or majors include Dietetics, Food Science and Restaurant Management.

Graduates may qualify as a Registered Dietitian through the pre-clinical dietetics program.

A major in restaurant management provides the basis for a career in food service management, hotel/motel and other hospitality industries.

The food science option is for the student who is interested in food production/advertising or food research and food technology.

## Department of Textiles, Clothing and Interior Design

Majors in the department include Interior Design and the options of 1) Apparel Design and 2) Retailing in the Textiles and Clothing major. They provide the basis for careers in interior design, fashion and home furnishings retailing plus other aspects of business and industry.

An upper division professional practicum with a business or firm related to a major provides insights and experiences transitional to a career.

## Curriculum

Students enrolled in the College of Home Economics must meet the University Core

## Home Economics Curricula

Major Field	Option or Minor	Department Administering
Child Development & Family Relations	Child & Family Services Children's Services in Hospitals Early Childhood Education Elementary Education (Cooperative Program) Family and Youth Organizations Religious Services Social Services	Child Development & Family Relations
Home Economics Education	Home Management and Consumer Studies	Home Economics Education
Home Economics Extension		Home Economics Education
Home Economics Journalism		Home Economics Education
Interior Design		Textiles, Clothing and Interior Design
Nutrition & Food Science	Dietetics Food Science	Nutrition & Food Science
Restaurant Management		Nutrition & Food Science
Textiles, and Clothing	Apparel Design Retailing	Textiles, Clothing and Interior Design

requirements and the College of Home Economics core-requirements to qualify for the Bachelor of Science degree.

In addition, each major area of study has specific required courses pertinent to the respective major area.

Minor changes occurring in programs are reflected in program guide sheets issued once a year. Entering students must meet the program requirements for graduation listed on the guide sheets, which will reflect the curriculum changes subsequent to the printing of this catalog.

Exploratory courses for those interested in specific majors offered through the Col-

lege of Home Economics are:  
CDFR 141 Individual and the Family  
HEd 101 Career Exploration  
HEd 130 Consumer Education  
NFS 111 Food and Man  
NFS 171 Introduction to Hospitality Industry  
TC 171 Clothing as a Human Resource  
ID 211 Art in Today's Home  
ID 221 Introduction to Interior Design

#### Undergraduate Honors Program

Students of high scholastic ability who wish more indepth study in their area of in-

terest may plan, with the staff, a specialized program of courses.

#### Graduate Program in Home Economics

Those pursuing a MS degree in Home Economics with a concentration in any one of the subject-matter areas are enrolled in the Graduate School. Your program of work is planned with a faculty adviser from the respective departments. Specific requirements are outlined in the Graduate School Bulletin obtained from the Dean of the Graduate School, South Dakota State University, Box 2201 Brookings, South Dakota, 57007-1998.



# Nursing

Carol J. Peterson, Dean  
Box 2275  
Brookings, SD 57007-0098

The College of Nursing is composed of three departments: Department of Nursing, Department of Health Science, and Department of Continuing Education. It has the broad goal of improving health care and the overall quality of life in the state, the region and the nation. It strives to reach this goal through the education of health care professionals, through provision of expertise and consultative service to the health care system of the state and through research, in the promotion of wellness in nursing and health care. The College has established the following unifying goals which are achieved through curricula and programs of the three departments.

1. Provide opportunities for selected men and women: a. to obtain baccalaureate education in the profession of nursing; b. to obtain baccalaureate education in the profession of health science in the areas of public health administration, sanitation, environmental health, and health education; c. to obtain graduate education in nursing; d. to learn about health and health care while pursuing other majors in the University.
2. Offer undergraduate and graduate curricula which provide sound foundations for further study.
3. Stimulate the professional and intellectual growth of individuals so they might assume responsibility for enlightened leadership in the community.
4. Provide opportunities for organization and synthesis of knowledge and skills adequate to contribute to the individual's search for solutions to society's problems.
5. Offer state-wide continuing education for health workers.
6. Provide expertise (knowledge and skill) to the state in an effort to solve problems related to health, health care, and general well being via:
  - a. participation in voluntary and professional organizations.
  - b. consultation to individuals, agencies, and/or institutions.
  - c. direct problem solving.

d. participation in or conduct of research.

e. continuing education programs.

7. Encourage and facilitate research in promotion of wellness, in nursing and in health care.

Non-majors, both men and women, are encouraged to select courses in the College of Nursing. Courses contributing to general education include: HSc 102, 141, 212, 261, 302, 432, 443. Students have the option of earning a minor in Health Science as detailed under that department's course offerings.

## Department of Nursing

A four-year curriculum leading to a Bachelor of Science degree in Nursing is offered by this department. The program consists of coursework in communication skills, the social, biological and physical sciences supportive to nursing, the student's choice of electives, and professional nursing. Graduates of this program in nursing are eligible to write the National Council Licensure Examination to become registered nurses. They are prepared to practice in both hospital and non-hospital settings and also have the foundation for advanced study in nursing.

This department also offers a graduate program in adult nursing that leads to a Master of Science degree in Nursing. The graduate program in nursing consists of advanced theoretical and clinical study in nursing and advanced work in selected supportive fields. It also provides role options in the teaching of nursing, in patient care management, and in advanced clinical practice.

## Department of Health Science

This department offers a four-year curriculum in Public Health Science leading to a Bachelor of Science degree. The Public Health Science curriculum provides experiences in sanitation, environmental health, health education, and health care administration.

## Department of Continuing Education

The Department of Continuing Education in cooperation with other departments

of the university and groups in the state offers courses and workshops for nurses and personnel in health-related disciplines.

Continuing education is organized within the College of Nursing to provide state-wide services to health personnel by offering off-campus and on-campus credit and non-credit courses in response to requests.

Academic standards and policies governing off-campus credit courses are identical to the on-campus instructional programs. Classes meet the same number of hours as on-campus. A minimum enrollment of fifteen students per credit course is required to cover expenses of instruction.

Consultant services are available to facilities and individuals through personal visits, telephone or correspondence.

Requests for programs or consultation may be made to the Department of Continuing Education, College of Nursing, SDSU, Box 2275, Brookings, SD 57007-0396.

## Professional Organizations

Membership is encouraged in the local, state and national nursing and health science student organizations. The purpose of these organizations is to prepare you for professional activity.

Phi Chapter, Sigma Theta Tau, an honor society in nursing, was established in 1961. Membership is by election; criteria include status in program, demonstrated ability in nursing, and an outstanding grade point average. Sigma Theta Tau stimulates professional growth and creative activity in nursing.



---

# Pharmacy

Raymond E. Hopponen, Dean  
Box 2201  
Brookings, SD 57007-0099

---

As one of the health professions, pharmacy is vitally concerned with public health and safety. Specifically, it is concerned with all activities associated with preparation, distribution and control of drugs and medicines. The aim of the College of Pharmacy is to qualify its graduates to assume their professional responsibilities as members of the profession most directly concerned with these activities. As society grows more complex, problems of providing proper medical services also grow more complex. This requires that pharmacy students must not only be provided with sound scientific and professional training but also be given opportunity to gain as much liberal education as possible to better understand the society which they serve.

The College of Pharmacy offers a five-year plan of study leading to the degree of Bachelor of Science in Pharmacy. The plan is designed to prepare you for the professional practice of pharmacy. The faculty has also designed several tracks that will better prepare you for community or institutional practice or to pursue graduate study in clinical pharmacy, business administration or in one of the pharmaceutical sciences such as pharmaceuticals, pharmaceutical chemistry, pharmacognosy or pharmacology. Students considering a track should consult an adviser about elective choices. In some cases substitution of elective courses for required courses may be allowed. Additionally, the College has a cooperative program with the University of South Dakota School of Business Administration by which you can earn a pharmacy degree and a Master of Business Administration on an accelerated basis. See the Curriculum section of the catalog for suggested tracks.

Graduates of the College of Pharmacy are eligible to apply for licensing in any state. In general, licensing as a pharmacist requires graduation from an accredited College of Pharmacy, a certified period of supervised experience and successful completion of a series of examinations administered by the Board of Pharmacy of the individual state. These requirements vary slightly from state to state. Students interested in practicing in a particular state should contact the Board of Pharmacy of

that state for information concerning requirements.

The College is accredited by the American Council on Pharmaceutical Education.

## Professional Organizations

Membership in the student branch of the American Pharmaceutical Association is open to all students in the college. Purpose of the organization is to give you a better appreciation of the scope and aims of your profession. It also provides an opportunity to develop leadership potential and to meet with other pharmacy students.

## College of Pharmacy Regulations

Students in the College of Pharmacy are governed in large measure by the regulations which apply to all students at SDSU. Therefore, you should be familiar with material in the general information section of the catalog. In addition to the all-university rules and regulations, the College of Pharmacy has some requirements specifically for pharmacy students.

Overall university requirements for graduation stipulate that you obtain an average of two grade points for each credit hour passed. In addition, you must earn at least two grade points for each credit hour in College of Pharmacy courses. In order to keep students who may be having academic difficulties aware of their situation, the college has instituted a set of "pharmacy probationary" standards. You will be placed on "pharmacy probation" whenever your cumulative average in pharmacy courses drops below 2.0. You will remain on "pharmacy probation" as long as the cumulative average in pharmacy courses remains below 2.0. If the semester grade point average in pharmacy courses of a pharmacy student on such probation drops below 2.0 he/she will be placed on refused status from the College of Pharmacy, you may not graduate while on pharmacy probation. It should be noted that this procedure applies only to pharmacy subjects and does not affect your standing in the university which is still governed by all-university regulations. A minimum of 164 credit hours of acceptable course work must be presented for graduation. You may transfer a maximum of six (6) credits of pharmacy prefixed courses from another college of pharmacy on approval of

the Dean. Exceptions must be approved by the faculty.

Pharmacy is a profession which demands high standards of professional and ethical conduct from its members. As part of their preparation for entry into the profession, students are expected to develop an understanding of these standards and to practice them in all college activities. The faculty of the College of Pharmacy reserves the right to take actions, including dismissal, against students for unethical, dishonest or illegal conduct that is inconsistent with professional standards.

## Curriculum

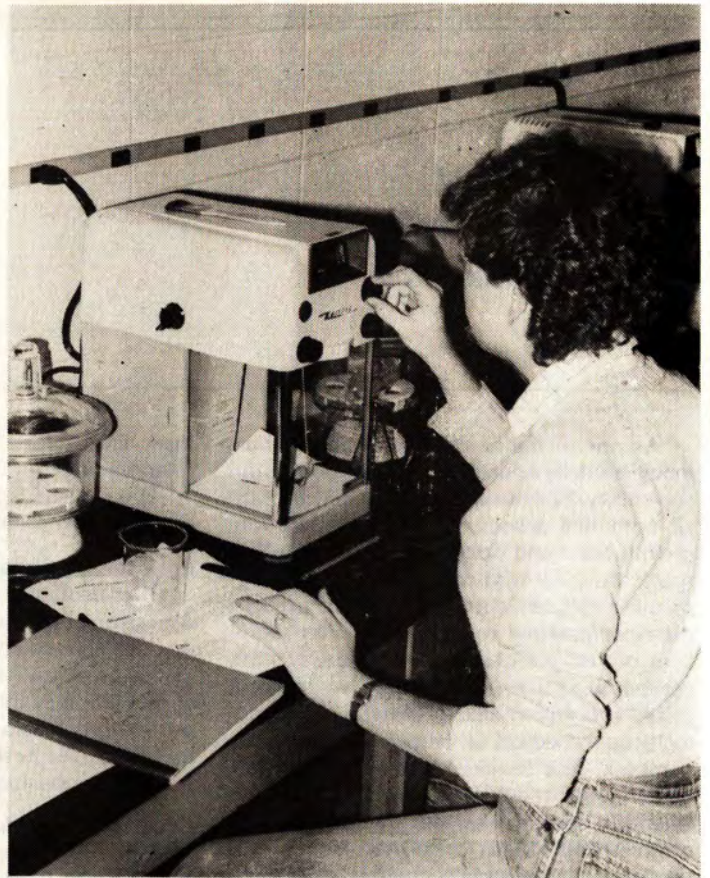
The College offers a five-year curriculum leading to the bachelor of science degree in pharmacy. The curriculum is divided into a one-year pre-pharmacy segment and a four-year professional program.

The 1-4 curriculum was developed in order to provide time for clinical experiences in the fifth year and to ensure that you are adequately prepared for these experiences.

You must ordinarily expect to spend four years in residence in order to complete the professional portion of the curriculum. Variations from the pattern may be permitted by faculty action. The first year (pre-professional portion of the curriculum) may be completed at any recognized junior college or four year college. Course work should be selected carefully to ensure that it will apply toward graduation from the College of Pharmacy. All students seeking admission to the second year must have completed Chemistry 112, Mathematics 113, and Biology 151 or their equivalents and possess an overall grade point average of at least 2.0.

Limitations in physical facilities make it necessary to limit the size of the second year class. Selection will be made from a pool of candidates consisting of all students seeking entry into the class.

Because the transmission of clearly defined and clearly understood information is a vital facet of pharmacy practice, a proficiency in oral communication is important for the pharmacist. Where there may be doubt concerning the oral communication ability of a candidate for admission to the second year (professional program) the candidate may be required to demonstrate a satisfactory degree of proficiency.



South Dakota

SWANEE

Depts. of Instruction



---

---

# Departments of Instruction

---

## Colleges, Departments and Program Abbreviations

---

**Actg**, Accounting  
**AE**, Agricultural Engineering  
**AgEc**, Agricultural Economics  
**AgEd**, Agricultural Education  
**AHEd**, Adult Higher Education  
**Air**, Aerospace Studies  
**Anth**, Anthropology  
**ArtD**, Art Design  
**ArtE**, Art Education  
**ArtH**, Art History  
**ArtS**, Art Studio  
**AS**, Animal Science  
**AV**, Audio-Visual  
**Avia**, Aviation  
**BAd**, Business Administration  
**Bio**, Biology  
**Bot**, Botany  
**CAI**, Computer Assisted Instruction  
**CDFR**, Child Development and Family Relations  
**CE**, Civil Engineering  
**CGPS**, Counseling, Guidance & Personnel Services  
**Chem**, Chemistry  
**Conc**, Concurrent  
**CSc**, Computer Science  
**Danc**, Dance  
**DCom**, Communication Disorders  
**DrEd**, Driver Education  
**DS**, Dairy Science  
**Econ**, Economics  
**EdAd**, Educational Administration  
**EdER**, Education Evaluation & Research  
**EdFn**, Educational Foundations

**EE**, Electrical Engineering  
**EG**, Engineering Graphics  
**EIEd**, Elementary Education  
**EM**, Engineering Mechanics  
**Engl**, English  
**Ent**, Entomology  
**EPsyc**, Educational Psychology  
**ES**, Engineering Shop  
**EurS**, European Studies  
**F**, Forestry  
**Fren**, French  
**FL**, Foreign Languages  
**GCom**, General Communication  
**GE**, General Engineering  
**Geog**, Geography  
**Germ**, German  
**HE**, Home Economics  
**HEd**, Home Economics Education  
**Hist**, History  
**Hlth**, Health  
**Ho**, Horticulture  
**HPER**, Health, Physical Education & Recreation  
**HSc**, Health Science  
**Hum**, Humanities  
**J**, Journalism  
**La**, Landscape Design  
**Ling**, Linguistics  
**MA**, Mechanized Agriculture  
**Math**, Mathematics  
**MCom**, Mass Communication  
**ME**, Mechanical Engineering  
**Micr**, Microbiology

**Mil**, Military Science  
**MuAp**, Music Applied  
**MuEn**, Music Ensembles  
**Mus**, Music  
**NFS**, Nutrition & Food Science  
**Nurs**, Nursing  
**PE**, Physical Education  
**Pha**, Pharmacy  
**Phil**, Philosophy  
**Phys**, Physics  
**Plan**, Planning  
**PolS**, Political Science  
**PR**, Parks  
**Prtg**, Printing  
**PS**, Plant Science  
**Psyc**, Psychology  
**PT**, Physical Therapy  
**Rang**, Range Management  
**Recr**, Recreation  
**Rel**, Religion  
**SeEd**, Secondary Education  
**Soc**, Sociology  
**Span**, Spanish  
**Sp**, Speech  
**SpCM**, Speech Communication  
**Stat**, Statistics  
**TCID**, Textiles, Clothing & Interior Design  
**Thea**, Theater  
**Vet**, Veterinary Science  
**VTTE**, Vocational Teacher Training Education  
**WL**, Wildlife  
**Zool**, Zoology



# Aerospace Studies (Air)

## College of Arts and Science

Lt. Col. Mencke, Professor of Aerospace Studies, head; Assistant Professors Captain Stone, Captain Smith, Captain Rolfe

### General

The Air Force Reserve Officer's Training Corps (AFROTC) program is conducted by the Department of Aerospace Studies. The purpose of this program is to enable qualified undergraduate and graduate students to become commissioned officers in the US Air Force. The learning experiences received will be of long range value in either a military or civilian career. Upon graduation and completion of the AFROTC curriculum the student is commissioned a second Lieutenant and will:

1. Enter the Air Force and complete the designated technical training course for your job specialty,
2. Receive a delay from active duty for pursuing an advanced degree at your own expense, or
3. Be selected for one of the Air Force sponsored graduate study programs while serving with full pay as an Air Force officer.

The following two programs are open to qualified male and female full-time students.

### Four Year Program

Designed for students completing a four-year college degree; however, it is easily modified to accommodate students with 3 to 5 years of academic studies remaining before graduation. Consists of: four semesters of General Military Courses, a four week Field Training Unit, four semesters of Professional Officer Courses. A Flight Instruction program is provided for cadets selected for pilot training after graduation/commissioning.

### Two Year Program

Designed primarily for transfer and graduate students with 2 years of academic studies remaining before graduation. However, other students who did not participate in Air Force ROTC during Freshman and Sophomore years may also participate. The two-year student must contact the Aerospace Studies Department no later than the Spring Semester before entering the program to allow time for selection, medical examination and scheduling for field training during the summer. Successful completion of the Field Training Unit is mandatory before entering the two-year program. The program consists of: six week Field Training session, four semesters of Professional Courses. A Flight Instruction Program (FIP) is provided for cadets selected for pilot training after graduation/commissioning.

### Aerospace Studies Minor

Those completing the four year program are qualified for an Aerospace Studies minor.

### Veterans/National Guard Members

Students with prior military training or service are evaluated by the Professor of Aerospace Studies for advance placement in the four-year program. In some cases, completion of the general military courses is not a prerequisite for entrance into Professional Officer Courses. Veterans are eligible for AFROTC Scholarships and AFTOTC subsistence payments in addition to Veterans' Educational Benefits.

### Financial Assistance

• **SCHOLARSHIPS.** Qualified students can compete for 4-year, 3 1/2 year, 3 year, 2 1/2 year and 2-year scholarships, which cover full tuition, books, laboratory expenses, incidental fees and \$100 per month tax free subsistence allowance. Scholarship competitions are also held at intermediate times to fill vacancies in the nationwide scholarship program. Awards are based upon officer potential. Applicants are nominated on the basis of: Air Force Officer Qualifying Test Scores, ACT or SAT college aptitude scores, academic major and grade point average, personal evaluation by the Professor of Aerospace studies.

Final selection is made by Air Force ROTC Headquarters.

**NOTE:** High school students should contact their high school counselor for application forms, to be completed following the junior year or early in the fall of the senior year. If your counselor does not have the forms, contact AFROTC Det 780, SDSU, Box 2236, Brookings, S.D. 57007-1697.

- Air Force ROTC courses are tuition free.
- Military uniforms, textbooks and equipment are furnished.
- Cadets enrolled in the Professional Officer Course received the same \$100 per month tax free subsistence allowance that scholarship students receive.
- Qualified cadets selected for pilot training receive flight ground school and up to 13 hours of flight training.

### The Air Force ROTC Curriculum

**THE GENERAL MILITARY COURSE (GMC).** The first two years of Air Force ROTC are general survey courses open to all. The courses provide an orientation to the history, organization and career opportunities of the USAF. This, in turn, provides the student with an orientation to an Air Force career without incurring a military service obligation.

During the last semester, qualified students interested in an Air Force Commission complete applications for the Professional Officer Corps and are scheduled for field training.

Students also participate in leadership laboratories while in general military courses.

**FIELD TRAINING.** Summer Field Training Units (FTUs) are conducted at operational Air Force bases and give the cadets an in-depth look at Air Force life and activities without incurring a military service commitment. It also gives the Air Force ROTC instructors a look at the students outside the university environment before they are accepted in the Professional Officer Course. Both the 4-week and the 6-week FTU include cadet orientation, junior officer training, survival training indoctrination, aircraft and aircrew indoctrination (including a 30 minute ride in a jet trainer), physical conditioning, career orientation, small arms familiarization, and a look at the organization and functions of an Air Force base. At the 6-week FTU, the additional two weeks are mainly used to complete the course material and leadership laboratory training missed by not participating in the General Military Courses on campus. Students are provided an airline ticket or paid 18.5 cents a mile for driving. At camp they receive free room, food, medical care, and \$17.00 (seventeen) pay per day.

**PROFESSIONAL OFFICER COURSE (POC).** The last two years of the Air Force ROTC program is designed for cadets accepting a commitment to enter the Air Force as commissioned officers upon graduation. Consequently, each cadet needs to develop proficiency in subject matter related to future effectiveness as an Air Force Officer. The curriculum of the Professional Officer Corps has been designed to acquaint the cadet with military management concepts and the relationship of the Air Force to American society. Cadets practice management concepts as cadet officers in the cadet corps.

**PROFESSIONAL OFFICER CORPS SELECTION CRITERIA.** Have four full time semesters remaining; complete the general military course or its equivalent; successfully complete field training; meet academic standards; choose one of the available career categories;

qualify on the Air Force Officer Qualifying Test and the ACT or SAT college aptitude test; qualify on the Air Force medical evaluation; be of sound moral character.

**FLIGHT INSTRUCTION PROGRAM.** Qualified Professional Officer Course cadets interested in becoming Air Force pilots (and selected as pilot candidates) participate in the Flight Instruction Program. Each potential pilot receives up to 13 flying hours and flight ground instruction from a rated Air Force pilot at the Aerospace Studies Department.

**LEADERSHIP LABORATORY.** General Military Course and Professional Officer Course cadets attend one hour of Leadership Laboratory a week. This course is conducted by and for the cadets to provide a working environment for the practice of leadership and management techniques. The Cadet Corps is organized with a commander and staff — together with all the functions and positions that exist in a normal military organization. Cadets study Air Force customs and courtesies; drill and ceremonies; career opportunities in the Air Force; the life and work of an Air Force junior officer. This typically includes one or two field trips to Air Force installations.

## General Military Courses

### 101 Aerospace Studies 100 1(1,1) F

History, doctrine, mission and organization of the Air Force strategic offensive and defensive forces; mission, function and employment of nuclear weapons; aerospace defense, missile defense.

### 102 Aerospace Studies 100 1(1,1) S

U.S. general purpose and aerospace support forces; mission, resources and operation of tactical air forces, with special attention to limited war; review of Army, Navy and Marine general purpose forces.

### 201 Aerospace Studies 200 1(1,1) F

Air Power from balloons and dirigibles through 1947; Air Force mission, concepts, doctrine and use of air power.

### 202 Aerospace Studies 200 1(1,1) S

History of air power from 1947 to present. Air Force relief missions and civic action programs in the late 1960's.

## Professional Officer Courses

### 301 Aerospace Studies 300 3(3,1) F

Individual motivational and behavioral processes; leadership and group dynamics provide a foundation for development of professional skills as an Air Force officer — includes speaking and writing as they apply to the Air Force.

### 302 Aerospace Studies 300 3(3,1) S

Basic management processes of planning, organizing, decision-making, controlling and use of analytical aids. The manager's world of power, politics, strategy, tactics and value conflicts discussed within the context of the military organization.

### 401 Aerospace Studies 400 3(3,1) F

Commissioned military service as a profession. The complex interaction between military and civilian society. Theory and workings of National Defense policy.

### 402 Aerospace Studies 400 3(3,1) S

Evolution of defense strategy and the methods of managing conflict. Analysis of the system of Military Justice.

## Agricultural Education (AgEd)

(see Education)

## Agricultural Engineering (AE)

### College of Engineering

Professor Hellickson, Head; Professors Chu, DeBoer, Professor Emeritus Delong, Lubinus, Moe, Wiersma; Associate Professors Durland, Lytle, Ullery, Werner; Assistant Professors Alcock, Bender, Cluever, Froehlich, Julson, Kelley, Lush, Schipull, Stange; Assistant-in Bischoff.

Agricultural Engineering is the science of engineering applied to the facilities and processes of agriculture and related industries. You are given foundation courses in mathematics, physics, and chemistry with engineering emphasis in a wide variety of technical areas: irrigation, drainage, water resources development, machine dynamics and design, agricultural power, electrical power utilization, processing of biological materials, environmental control for livestock, control and disposal of agricultural wastes, agricultural structures, and instrumentation. Courses are also offered in the fields of meteorology, climatology, and micro-climatology to engineers and students in other colleges who are interested.

To earn the Bachelor of Science Degree in Agricultural Engineering a student must have an average grade of C or better in courses taken and required in the Agricultural Engineering Department.

Cooperative Education and Industry Cooperative Programs are available in the department. Arrangements may be made for some credit under Course No. 495, Engineering Cooperative Internship.

For mechanized agriculture courses and curriculum as offered by the Agricultural Engineering Department, see Mechanized Agriculture for full description. For Master of Science work, see the Graduate Bulletin. Graduate level courses will be taught as listed and on demand.

### Curriculum in Agricultural Engineering

(Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology)

#### 128 semester credits required for the Bachelor of Science degree

##### Freshman Year

	F	S
Mathematical Analysis I-II, Math 123-124.....	5	4
Gen Chem, Chem 112 and 114.....	4	3
or		
Gen Chem, Chem 110 and EI.		
Org. Chem, Chem 120		
Fr Comp Engl 101 or SpCm 101.....	3	3
Engineering Design Graphics I-II,		
EG 121-122.....	2	2
Fitness & Lifetime Activities, PE 100.....	1	1
Engineering Orientation, GE 110.....	0	
Statics, EM 221.....		3

##### Sophomore Year

	F	S
Mathematical Analysis III, Math 225.....	3	
Gen Physics I-II, Phys 211, 213.....	4	4
Elementary Surveying, CE 106.....	3	
Creative Design in Ag Engineering, AE 202...	2	
Introduction to Programming with FORTRAN,		
CSc 312.....	3	
Microcomputer Appl. in AE, AE 372.....		2
Dynamics, EM 222.....		3
Differential Equations, Math 321.....		3
Intro to Literature, Engl 218.....		3
†Electives.....	2	1

##### Junior Year

	F	S
Mechanics of Materials, EM 321.....	3	
Thermodynamics, ME 314.....	3	
Ag Structures, AE 324.....		4
Macroeconomics Principles, Econ 201.....		3
Basic Elec. Engr. I 305.....	3	
Tech Comm., Engl 303.....	3	
Fluid Mechanics, EM 331.....		3
Ag Power & Machines, AE 314.....	4	
†Electives.....	3	3

##### Senior Year

	F	S
Electric Power & Processing, AE 444.....		4
Soil & Water Engineering, AE 434.....	4	
Applied Instrumentation, AE 463.....	3	
Seminar & Inspection Trip, AE 471.....	1	
Ag Engineering Concepts & Design, AE 464..		4

Business Finance, B-Ad 310 or Business Mgmt, B-Ad 360 .....	3	
World Crop and Soil Resources, PS 433.....	3	
†Electives .....	2	8

\*If you do not receive a 'C' or better in Engl 303, you must pass Engl 307 with a grade of 'C' or better.

†Elective courses permit you to concentrate on the applied technical area of his/her particular interest, and to provide for further cultural growth and education in the humanities social sciences area.

Accordingly the elective program for each student must be approved by his/her adviser. This will include at least 9 credit hours of technical electives of which at least 5 credits are 300 or above level courses in the College of Engineering. In addition, the student's program must include at least 16 social science/humanities credits. The social science/humanities credits must include at least 6 credits of humanities from at least two disciplines and at least 9 semester hours of social science credits from at least two disciplines. At least one social science/humanities course must be taken at the advanced level.

**Suggested Technical Electives:**

Suggested electives in all options. Physical Climatology & Meteorology, AE 353; Special Topics, AE 470; Special Problems in AE, AE 490; Cooperative Education/Internship/Field Experience, AE 494, 495, 496 all 500 level courses listed in Agricultural Engineering; Statistics 341 or Math 381, Advanced Engr. Math, Math 331; Computer Operation, CSc 314; Computer Languages, CSc 316; Special Topics in Computer Science, CSc 391; Microcomputer Applications, ECom 425; Computer Architecture & Organization, ECom 426; Engineering Economy, GE 422\*; Biology, Biol 153; Soils, PS 113 or Soils Engineering, CE 446.

**Structures & Environment**

	Credits
Steel Design, CE 455 .....	3
Concrete Theory & Design, CE 456 .....	3
Industrial Engineering, ME 362.....	3
Engineering Administration*, CE 475.....	3
Heating, Ventilating & Air Conditioning, ME 411.....	3
Heat Transfer, ME 415.....	3
Structural Theory, CE 353.....	2
Soils Engineering, CE 446 .....	4
General Microbiology, Micr 231.....	4

\*Technical elective credit not given for both CE 475 & GE 422.

**Power and Machinery**

	Credits
Mechanisms, ME 321 .....	3
Vibrations, ME 322 .....	3
Metallurgy, ME 341 .....	3
Industrial Engr., ME 362.....	3
Internal Combustion Engines, ME 412.....	3
Heat Transfer, ME 415.....	3
Design of Machine Elements, ME 421 .....	4
Machine Design, ME 428.....	2
Applied Stress Analysis in Mechanical Design, ME 522.....	3
Physical Environment of Soils & Plants, PS 352 .....	2

**Electric Power & Processing**

	Credits
Industrial Engineering, ME 362.....	3
Heating, Ventilating & Air Conditioning, ME 411.....	3
Heat Transfer, ME 415.....	3
Heating, Ventilating & Air Conditioning II: Design, ME 419.....	3
Automatic Controls, ME 451.....	3
General Microbiology, Micr 231.....	4
Electronics I, Elec 320 .....	4
Electromagnetic Field Theory I, EE 385 .....	3
Energy Conversion, EPow 430 .....	4

**Water Resources Engineering**

	Credits
Physical Environment of Soils & Plants, PS 352 .....	2
Irrigation—Crop & Soil Practices, PS 483.....	3
Hydrology, CE 333.....	2
Water Supply Engr., CE 327.....	4
Hydraulic Engineering, CE 433.....	3
Soils Engineering, CE 446 .....	4
Soils, PS 113.....	3

**Environmental Management**

	Credits
Water Supply Engineering, CE 327.....	4
Environmental Engineering, CE 523.....	3
Agricultural Waste Management, MA 463.....	3
Environmental Chem, Chem 380 .....	4
Environmental Biology, Biol 211 .....	3
General Microbiology, Micr 231.....	3

Environmental Microbiology, Micr 310.....	4
Environmental Conservation, WL 210.....	2

**Undergraduate Courses**

**202 Creative Design in Ag Engineering 2(1,3) F**  
Analysis of farm machinery and equipment design, development and evaluation. P, sophomore standing.

**314 Ag Power & Machines 4(3,2) F**  
Analysis of factors affecting field machines and tractor performance, engine design, transmissions, traction, hitches, hydraulic systems, economics. P, EM 222, concurrent with ME 314.

**324 Ag Structures 4(3,2) S**  
Construction materials and agricultural structures design using wood, plywood, steel, concrete and connectors. Agricultural environmental fundamentals, modification, control and ventilation. Environmental requirements for livestock and livestock housing systems design. P, ME 214 concurrent.

**353 Physical Climatology & Meteorology 3(2,2) FS**  
Physical description of daily weather changes and circulation of the atmosphere. Long time means and variation from means of climatological parameters. Application of meteorological and climatological principles to various problem areas.

**372 Microcomputer Applications in Agricultural Engineering 2(1,3) S**  
Data collection, computer aided engineering and processing using a microcomputer based system. Performing monitoring and controlling functions for electrical and electronic equipment using microcomputer technology. P, CSc 312.

**434 Soil & Water Engineering 4(3,3) F**  
Precipitation, infiltration, evapotranspiration and runoff from small agricultural watersheds and application to design of conservation structures, water and wind erosion control practices. Design of drainage and irrigation systems. Feedlot pollution control principles. P, EM 331.

**444 Electric Power & Processing 4(2,3) S**  
Electricity for agricultural uses, basic electrical circuits, motors, lighting controls and agricultural electronics. Principles and applications of agricultural product processing and handling equipment, facilities and systems. P, EE 305 concurrent.

**463 Applied Instrumentation 3(2,2) F**  
The generalized measurement system consisting of the detector-transducer, intermediate modifying stage and terminating stage is considered. Applied use of oscilloscopes, oscillographs, potentiometers, operational amplifiers, x-y plotters and other basic instruments. Electronic instrumentation and microprocessor based data acquisition systems. P, EE 305

**464 Ag Engineering Concepts & Design 4(2,4) S**  
Procedures, theory, concepts and design of agricultural equipment for soil and water, structures and environment, electric power and processing and farm machinery applications.

**471 Seminar & Inspection Trip 1(1,0) F**  
Review of current technical literature in agricultural engineering. Oral and written reports and discussion. P, senior standing.

**492 Special Problems in Ag Engineering 1-3 FSSu**  
The solution must be written up in a final report. P, must have approval of the adviser and head of department.

**493 Special Topics 1-4 (1-4, 0-2)**  
(On demand.) Individual or group study. P, consent.

**494-495-496 Cooperative Education/Internship/Field Experience 1-6 FSSu**  
Planned and supervised professional experience related to agricultural engineering which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

**Graduate Courses**

**503-603 Energy & Environment 3(3,0) S87 F88**  
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.

**512-612 Advanced Agricultural Tractors & Machines 2(2,0) S87 F88**  
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 and AE 464 or equivalent.

**522-622 Bio-environmental Engineering 2(2,0) F86 S88**

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, 324.

**533-633 Advanced Irrigation Engineering 3(2,3) S86, F87**

Basic soil-water crop relationships. Theory and design of pumping plants, surface, sprinkler and drip irrigation systems. P, 434 or consent.

**542-642 Engineering Phases of Crop Processing 2(2,0) S86 F87**

Physical properties of agricultural crops and engineering principles as they apply to cutting, shearing, collecting, packaging, transporting, drying, handling and storing agricultural products.

**552-652 Theoretical Micro-Climatology 2(2,0) S87 F88**

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 the ground. P, Calculus, Physics 353.

**563-663 Instrumentation 3(2,3) S87,88**

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, Phy 213, Math 225.

**573-673 Programming Agricultural Systems 3(2,2) S87 F88**

Basic FORTRAN programming. Application of computer to solve problems in agricultural engineering, gathering, processing, evaluating engineering and scientific data. P, CSc 312 or consent of instructor.

**695 Special Topics on Demand**

**732 Advanced Hydrology in Agriculture 2(2,0) F87, S89**

**733 Ground Water Engineering In Ag 3(3,0) F86, S88**

**770 Special Problems in Ag Engineering (1-2 on demand)**

**771 Graduate Seminar 1(1,0) F86, F87**

**772 Similitude 2(1,2) F86, S 88**

**790 Thesis**

## Agricultural Extension (AgExt)

### College of Agriculture and Biological Sciences

Lloyd H. Hansen Extension Program Development Coordinator

The Cooperative Extension Service is the off-campus educational function of the College of Agriculture and Biological Sciences. The Service extends the SDSU campus to every community and the advantages of higher education to all people. Through its extension agents, and supporting statewide specialists, the Cooperative Extension Service disseminates the findings of research and encourages the application of knowledge to solution of problems encountered in everyday living.

The Agricultural Extension curriculum is designed for students who wish to prepare for Extension education work as Extension Agents in the Cooperative Extension Service. The major will also prepare students for opportunities in agribusiness and farming. Since there are many courses in common with Agricultural Education, some students may desire to complete the requirements of both curriculums in order to qualify for both Extension and teaching.

**Curriculum in Agriculture,**  
Agricultural Extension Major  
Leading to the Bachelor of Science degree

Freshman Year	F	S
Fr. Comp., Engl. 101.....	3	
Fitness & Lifetime Activities PE 100.....	1	1
Crop Production, PS 103.....		3
Algebra, Math 111.....		3
Introduction to Animal Science, AS 101.....		3
General Horticulture, Ho 111.....		3
General Psychology, Psy 101.....		3
Elements of Dairying, DS 130.....	3	
Biology, Bio 151.....	3	
General Chemistry, Chem 110.....	4	
Electives.....	2	
	<hr/> 16	<hr/> 16

**Sophomore Year**

	F	S	Credit
Fundamentals of Speech, SpCm 101.....			3
Introduction to Sociology, Soc 100.....			3
General Microbiology, Micr 231.....	4		
Elements of Organic Chem, Chem 120.....	4		
Soils, PS 113.....			3
Introductory Physics, Phy 101.....			4
Weed Control, PS 343 or Forage Crops & P Mgmt PS 313 or PI Path, PS 223.....	3		
Crop & Livestock Insects, PS 293 or Hort Insects, PS 295.....			3
Practical Range Mgt., Rang 200.....	3		
General Elective (See suggested list).....	3		
	<hr/> 17		<hr/> 16

**Junior Year**

	F	S	Credit
Junior Composition, Engl 300.....			3
Animal Nutrition, AS 223.....			3
Principles of Econ I, Econ 201.....	3		
Educational Psychology, EPsyc 302.....	2		
Humanities Elective*.....			3
Farm Power & Machinery, MA 213.....	3		
Farm & Ranch Mgt — Ag Econ 271.....	4		
Seminar, Ag Ed 301.....	1		
General Electives (See suggested list).....	3		3
Field Practice in Ext., AHed 400 (Preferred summer between junior and senior year).....			(2-5)
	<hr/> 16		<hr/> 16

**Senior Year**

	F	S	Credit
Animal Diseases and Their Control, Vet 403..	3		
Humanities Elective*.....	3		
Swine Production, AS 478, or Sheep & Wool Production, AS 477.....			3
Beef Production, AS 474.....			3
Feed Technology, AS 333.....			3
Publicity Methods, MCom 313.....			3
Parliamentary Procedure, SpCm 335.....	3		
General Electives (See suggested list).....	7		1
	<hr/> 16		<hr/> 16

\*See listing of courses for humanities and social sciences electives.

Electives for Extension Education majors should be selected from the following courses: (Those with asterisks should be given priority consideration.) To broaden the student's scope and knowledge consideration should be given to selecting at least one elective course from each of the Extension program and general categories listed below.

If you desire a specific minor or double major, you should choose your elective from that curriculum.

Agriculture:	Credits
**Livestock Evaluation, AS 212.....	2
**Principles of Plant Pathology II, PS 333.....	3
**Irrigation — Crop and Soil Practices, PS 483.....	3
Farm Building Mechanization, MA 423.....	3
Ag Waste Management, MA 463.....	3
Anatomy & Physiology of Livestock, Vet 223.....	4
Vegetable Growing, HO 212.....	3
Landscape Design I, LA 321.....	3
<b>Natural Resources:</b>	<b>Credits</b>
Wildlife & Fisheries on Farms and Ranches, WL 212.....	2
Principles of Ecology, Bio 211.....	3
World Crop & Soil Resources, PS 433.....	3
Energy & Agricultural Technology, MA 492.....	3

<b>Community Development:</b>	<b>Credits</b>
Rural Sociology, Soc 240.....	2
Population Problems, Soc 362.....	3
General Anthropology, Anth 200.....	3
Public Finance, Econ 433.....	3
Comparative Economic Systems, Econ 405.....	3
Agricultural Policy, Ag Ec 479.....	3
Rural Community Planning, Soc 540.....	3
Leadership & Group Organization, Soc 533.....	3
<b>Youth Development:</b>	<b>Credits</b>
Social Problems, Soc 150.....	2
Recreation Leadership, Recr 360.....	2
Management in Family & Personal Living, HE 241.....	2
<b>Communication and Leadership Skills:</b>	<b>Credits</b>
**Public Speaking, SpCm 315.....	3
Discussion, SpCm 334.....	2
**Broadcast Programming, MCom 335.....	3
Public Administration, PolS 320.....	3
<b>Other: (Applicable to all Extension programs)</b>	<b>Credits</b>
**Principles of Economics II, Econ 202.....	3
**Marketing, Econ 353.....	3
**Indians of North America, Anth 421.....	3
**Statistical Methods, Stat 341.....	3

## Agricultural Journalism

(See Department of Journalism)

## Agronomy

(See Plant Science)

## Animal Science (AS) and Range Science (Rang)

### College of Agriculture and Biological Sciences

Professor Romans, Head; Professors Gartner, Gee, Granholm, Libal, Luther, McCarty, Minyard, Plumart, Slyter, Wahlstrom; Professors Emeriti Carlson, Dinkel, Embry, Kamstra, Kohler, Kortan, Lewis; Associate Professors Costello, Johnson, Miller; Associate Professors Emeriti Bush, McCone; Assistant Professors Hamilton, Jones, Marshall, Pritchard, Pruitt, Schlundt, Thompson, Wagner, Whittington. Adjunct Professors Bjugstad, Haas, Swanson.

The department offers instruction leading to the Bachelor of Science degree with majors in Animal Science or Range Science. Master of Science and Doctor of Philosophy Degrees may be earned in Animal Science.

**Animal Science Major** Majors receive instruction in animal breeding, feeding and nutrition, management, selection and evaluation, marketing, meats and wool. Courses pertain to beef cattle, horses, poultry, sheep and swine. Instruction in livestock production under both farm and ranch conditions is presented. All students electing the major will complete the same basic core of courses. In addition, the student chooses one of three options: (a) Business, (b) Production or (c) Science. Students are encouraged to supplement their class and laboratory instruction with practical experience in the line of work they plan to pursue after graduation.

### Curriculum in Agriculture, Animal Science Major

Leading to the Bachelor of Science degree

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr. Comp Engl 101.....	3	or 3

Fund Speech, SpCm 101.....	3	or	3
Fitness & Lifetime Activities, PE 100.....	1		1
Intro to Animal Science, AS 101.....	3		
Intro to Sociology, Soc 100.....			3
Intro Biology, Bio 151, 153.....	3		3
Elective and option courses.....	6		7
<b>Sophomore Year</b>	<b>F</b>		<b>S</b>
Animal Nutrition, AS 223.....			3
Meat: Production to Consumption, AS 241.....	3		
Macroeconomic Principles, Econ 201.....	3		
Social Science Elective.....			3
Genetics, Bio 371.....	3		
Biochemistry, Chem 260.....			4
Elective and option courses.....	7		6
<b>Junior Year</b>	<b>F</b>		<b>S</b>
Junior Comp, Engl 300.....	3		
Prin of Animal Breeding, AS 332.....			4
*Humanities electives.....	3		3
Engl 303 or MCom 313.....	3	or	2
Option and elective courses.....	7		9
<b>Senior Year</b>	<b>F</b>		<b>S</b>
Livestock Reproduction, AS 433.....	3		
Animal Science Seminar, AS 483.....	1		
AS Production Courses (See options)			
Option & elective courses.....	12		15

\*See approved list.

<b>Production Option,</b>	<b>Credits</b>
Algebra, Math 111 or Algebra & Trig, Math 113.....	3 or 5
Gen Chem, Chem 110.....	4
Intro Physics, Phys 101 or Elementary Physics I, Phys 111 or General Physics I, Phys 211.....	4
Organic Chem, Chem 120.....	4
Livestock Evaluation and Marketing, AS 285	4
Anatomy & Physiology of Livestock, Vet 323†.....	4
Gen Microbiology, Micr 231.....	4
Feed Technology, AS 333.....	4
AS Production Courses. Elect two from: AS 365, 366, 474, 477, 478, or Rang 200 — one must be 474, 477 or 478.....	6
Group I electives.....	9
General electives.....	22-25

\*AS 592 Special Topics is available for students interested in additional specialized instruction in the poultry industry.

†Students planning graduate work or who plan to go into veterinary science should substitute Zool 221 and 325.

<b>Science Option</b>	<b>Credits</b>
Gen. Chem., Chem 112, 114.....	8
Organic Chem., Chem 120.....	4
Algebra & Trig, Math 113, & Calculus for non-Math majors, Math 222, or Algebra, Math 111; Plane Trig, Math 120 & Calculus for non-Math Majors, Math 222.....	10 or 11
Gen Microbiology, Micr 231.....	4
Elementary Physics I-II, Phys 111-113 or Gen Physics I-II, Phys 211-213.....	8
Feed Technology, AS 333.....	4
Anatomy, Zool 221 Mammalian Physiology, Zool 325 or.....	7
Anat. and Physiol. of Livestock, Vet 323†..	4
AS Production Courses, AS 365, 366, 474, 477, 478 (Elect two, one must be 474, 477 or 478.....	6
Group I electives**.....	6
General electives.....	12-17

\*AS 592 Special Topics is available for students interested in additional specialized instruction in the poultry industry.

\*\*Except 101 and 223 which are required of all Animal Science majors.

†Students planning graduate work or who plan to go into veterinary science should substitute Zool 221 and 325.

### Business Option,

	Credits
Algebra, Math 111 or Algebra & Trig, Math 113.....	3 or 5
Intro Physics, Phys 101 or Elementary Physics I, Phys 111 or General Physics I, Phys 211.....	4
Gen Chem., Chem 110.....	4
Organic Chem, Chem 120.....	4
Microeconomics Principles, Econ 202.....	3
Prin of Accounting I, Actg 210.....	3
Livestock Evaluation and Marketing, AS 285	4
Anatomy & Physiology of Livestock, Vet 323	4
Feed Technology, AS 333.....	3
Communications elective in addition to core requirement**.....	2 or 3
Business Management B-AD 360.....	3
AS Production Courses. Elect two from: AS 365, 366, 474, 477, 478, or Rang 200 one of which must be 474, 477, or 478.....	6
Business electives.....	12
Group I electives.....	6
General electives.....	5-9

\*AS 592 Special Topics is available for students interested in additional specialized instruction in the poultry industry.

\*\*To be chosen from Engl 303; MCom 210, 313, 315, 330, 331, 335; SpCm 315, 334, 335.

†Students planning graduate work or who plan to go into veterinary science should substitute Zool 221 and 325.

Animal Science majors who desire to prepare to teach vocational agriculture need to plan on completing a double major in Animal Science and Agricultural Education. The Production Option meets the Animal Science part of requirement. Contact an Adviser in Agricultural Education not later than the Sophomore year for details about qualifications for Teacher Certification.

The Animal Science degree has a minimum requirement of 128 semester credits. The double major would necessitate completing 140 to 146 semester credits. This could be accomplished in an extra semester or by attending two summer sessions.

### Animal Science Minor

19 cr. of AS courses including: 101, 223, 285; one of 332, 333 or 433; two of 241, 365, 366, 474, 477, 478 one of which must be 474, 477 or 478.

## Undergraduate Courses

### 101 Intro to Animal Science 3(2,2) FS

Adaptation, breeding, feeding, marketing, classification, selection of market and breeding types of beef cattle, horses, sheep, swine and poultry.

### 105 Horsemanship 1(0,2) FS

Breeds of riding horses, gaits, grooming, equipment, rations; basic riding instruction with western type equipment.

### 219 Livestock Management 3(2,2) F

Not open to AS majors. Recommendations for feeding and breeding systems, diseases and sanitation, housing, space requirements and other practices. P, 101.

### 223 Animal Nutrition 3(3,0) FS

Functions of various nutrients; digestion and metabolism of nutrients by different animal species. Chem 120 desirable antecedent. P, 101.

### 241 Meat: Production to Consumption 3(3,0) FS

Survey of meat industry. Composition of meat animals. Product identification, preservation, cooking, nutritive value, pricing and curing.

### 242 Meat Processing Lab 1(0,3) FS

Provides experience and training in meat animal slaughter, wholesale and retail cut preparation and meat processing techniques.

### 251 Carcass Evaluation 2(0,4)S

Techniques in evaluating carcasses of meat animals. Meat grading and judging. P, 285.

### 285 Livestock Evaluation and Marketing 4(3,3)FS

Live and carcass evaluation of market animals. Methods of marketing and pricing livestock and carcasses. P, 101.

### 322 Livestock Judging 2(0,4) S

Type studies and selection for individual excellence; judging and oral discussion of classes of beef cattle, horses, sheep and swine. P, 285.

### 332 Principles of Animal Breeding 4(3,2) FS

Application of genetics to improvement of farm animals. Emphasis on occurrence, origin, use and control of variation in economically important traits of farm livestock. P, Bio 371.

### 333 Feed Technology 4(2,4) FS

Classification and nutritional characteristics of feedstuffs; methods of evaluating feedstuffs; principles of ration formulation and balancing for farm animals; preparation, processing, handling and storage of feedstuffs and feed regulation and control. P, 223.

### 345 Meat Technology 3(2,2) AY-S

(Offered in 1987) Relate use as a food to structure, composition and function of muscle and connective tissues. Principles and practices of meat processing, product evaluation and quality control in food industry. P, 241.

### 352 Meat Grading & Selection 1(0,2) F

Identifying, judging and grading carcasses and cuts; training in writing reasons; participation in intercollegiate meat judging contests. P, 285, 251.

### 365 Horse Production 3(2,2) S

Feeding, breeding and management principles for light horses. P, 101.

### 366 Poultry Management 3(3,0) F

Development and organization of the poultry industry, its economic importance and relation to total agriculture. Biology of the fowl. Management practices with emphasis upon the genetic, nutritional, disease, housing and equipment aspects.

### 432 Advanced Livestock Judging 1(0,2)F

Continuation of 322. Trips to purebred herds; participation in American Royal and International Livestock Judging contests. P, 322.

### 433 Livestock Reproduction 3(2,2) F

Basic physiological processes of reproduction in domestic animals, factors affecting and methods of improving reproductive efficiency. P, Vet 323.

### 474 Beef Cattle Production 3(2,2) FS

Feeding, breeding and management principles of beef cattle production under farm and ranch conditions. P, 101, 223. Desirable antecedents 332, 333.

### 477 Sheep & Wool Production 3(2,2) F

Feeding, breeding and management principles for maximum production of meat and wool in farm and range flocks. P, 101, 223. Desirable antecedents 332, 333.

### 478 Swine Production 3(2,2) S

Feeding, breeding and management principles for swine production. Breeds, production trends and equipment. Student participation in management techniques. P, 101, 223. Desirable antecedents 332, 333.

### 483 Animal Science Seminar 1(1,0) FS

Review of current research, discussions and reports. Limit 2 credits. P, senior standing.

### 494-495-496 Cooperative Education/Internship/Field Experience 1-12 SSS

Supervised experience with a livestock enterprise or related agribusiness for exposure to industry problems and solutions, evaluation of career objectives and final career preparation.

## Graduate Courses

### 523-623 Population Genetics 3(3,0) AY S

(Offered in 1986) Genetic structure of populations and forces affecting this structure. Theories of biological variation, race and species formation. P, Bio 371 or equivalent, Stat 641 or equivalent highly recommended, AS 332, PS 443 or equivalents.

### 531-631 Ruminant Nutrition 3(3,0)S

Principles of nutrition for ruminants in relation to growth, reproduction, lactation and finishing. P223, 333, Chem 260, Vet 323 or Zoo 325.

### 536-636 Monogastric Nutrition 3(3,0)F

Nutrition principles for non-ruminants related to reproduction, lactation, and growth. P 223, 333, Chem 260, Vet 323 or Zoo 325.

### 553-653 Meat Science 3(2,2) AY S

(Offered in 1986) Basic physical, chemical, microbiological and histological characteristics of meat and effects of various processing methods on meat products and by-products. P, 241.

**591-691 Research Problems 1-3 FSSu**

Investigation of problems in following areas with results submitted as technical paper: Animal breeding, Nutrition, Meats, Livestock Production, Reproductive Physiology, Wool Technology, Poultry. Maximum of 3 credits for student program.

**592-692 Special Topics 1-6 FS**

Advanced study of one or more selected topics: breeding, management, product technology, physiology, nutrition, research methods or marketing.

**711 Ruminology 3(3,0) F Odd Years**

Biochemical, physiological and microbiological activity occurring in the rumen and the relation of rumen function to animal responses. P Chem 260, Vet 323 or consent.

**731 Experimental Procedure 2(2,0) AY F**

**732 Advanced Physiology of Reproduction 3(2,2) AY S**

**733 Nutritional Interrelationships 3(3,0)S Odd Years**

Relationships between nutrients in metabolism. Substitution and sparing effects with emphasis on minerals and vitamins. Comparing metabolic significance of required nutrients for different animal species and as applied to human nutrition. P 223, 333, Chem 260, Vet 323 or Zoo 325.

**734 Protein and Energy Nutrition 3(3,0)F Even Years**

Principles of protein and energy metabolism and the partitioning of these nutrients for maintenance, growth and production in domestic farm animals. P 223, 333, Vet 223 or Zoo 325.

**790 M.S. Thesis in Animal Science FSSu**

**890 Ph.D. Thesis in Animal Science FSSu**

**Range Science (Rang)**

The Range Science Program offers a multi-faceted curriculum for students interested in land management as it relates to ranching, public land administration, mine land reclamation, banking in ranch communities and other related industries. Graduates meet the qualification standards for the Range Conservationist and Soil Conservationist positions leading to employment by the Soil Conservation Service, Bureau of Land Management, Forest Service, Bureau of Indian Affairs, and other federal agencies. The breadth of this curriculum also prepares the graduate for work with the Extension Service and with various state and federal agencies involved in resource management, land appraisal, lending activities or regulatory functions. The graduate may also qualify for range management assistance positions in developing countries. Furthermore, the curriculum prepares students to enter graduate school leading to various other kinds of employment, including research and university teaching. Structured advising is provided to prepare students for employment in specific fields and potential employers are informed of students educational qualifications for specific jobs.

**Curriculum in Agriculture, Range Science Major**  
Leading to the Bachelor of Science degree.

	F	S
<b>Freshman Year†</b>		
Fr. Comp Engl 101.....	3	
Fitness & Lifetime Activities, PE 100.....	1	1
Gen Chem, Chem 110.....	4	
Organic Chem, Chem 120.....		4
Intro Biology, Bio 151, 153.....	3	3
Algebra & Plane Trigonometry, Math 113 or Algebra & Trig, Math 111.....	5 or	3
Intro to Sociology, Soc 100.....		3
Fund of Speech, SpCm 101.....		3
<b>Sophomore Year</b>	F	S
Intro to Animal Science, AS 101.....	3	
Agrostology, Bot 305.....	3	
Plant Taxonomy, Bot 301.....		4
Macroeconomics Principles, Econ 201.....		3
Elementary Biochemistry, Chem 260.....	4	
Animal Nutrition, AS 223.....		3
Practical Range Management, Rang 200.....	3	
Soils, PS 113.....	3	
Social Science Elective*.....		3
Humanities elective*.....		3
<b>Junior Year</b>	F	S
Junior Comp, Engl 300.....	3	

Prin of Range Science, Rang 300.....		3	
Plant Ecology, Bot 415.....		4	
Soil Geography & Land Use Interpretation, PS 310.....		4	
Forage Crops & Pasture Management, PS 313.....		3	
Elementary Physics I, Phys 111 or General Physics I, Phys 211.....		4	
Statistical Methods I, Stat 341.....			3
Advanced Exposition, Engl 303 or Publicity Methods, MCom 313.....			2-3
Genetics, Bio 371.....			3
Gen Forestry, F 131 or Dendrology, F 231 or Forest Ecology, F 232.....			2-3
Range Measurements, Rang 323.....			2
Range Management Planning for Ranchers, Rang 471.....			2
<b>Special Summer Session</b>			<b>Su</b>
Range Surveys, Rang 324.....			2
Field Studies in Range Science, Range 421....			2
<b>Senior Year</b>			<b>F</b>
Range Improvement, Rang 411.....		2	
Range Management Planning on Public Lands, Rang 470.....			2
Beef Cattle Production, AS 474.....			3
Sheep & Wool Production, AS 477.....		3	
Farm & Ranch Management, Econ 271.....			4
Plant Physiology, Bot 427.....		4	
Intro to Wildlife and Fisheries Management, WL 220.....		2	
Range Ecosystems, Rang 321.....			3
Humanities electives*.....			3
Electives.....			1-4

\*See approved list.

Range Science Minor:Eighteen credits with twelve hours of Range Science (to include 300) and other courses as approved by the department.

†Curriculum sequence applies to those who begin this major as Freshmen during the Fall of even years (e.g. Fall 1988). Those entering as Freshmen in odd years (e.g. Fall 1987) and those entering with advanced standing take these courses in a slightly different sequence. You should consult your adviser in Range Science for a correct schedule.

**Undergraduate Courses**

**200 Practical Range Management 3(2,2) F**

An overview of range management, stressing practical applications for all uses on private and public lands. Recommended for those desiring the greatest amount of practical information in the allotted time or as an introduction to Range Science. Identification and ecological characteristics of important range plants of the Northern Great Plains are included.

**201 Range Plant Identification 1(0,2) FS, sequence required. 3 cr maximum.**

Instruction and practice in the recognition of important range plants of North America, P, instructor's consent\*.

**300 Principles of Range Science 3(3,0) AY F**

(Offered in 1988) Basic principles of range science including structure, function and management of range ecosystems. Factors affecting energy flow, the water cycle and nutrient cycles are stressed in relation to management strategies on ranches, public, and reclaimed lands. Desirable antecedents: 200, Bot 261, PS 113\*\*.

**321 Range Ecosystems 3(3,0) AY S**

(Offered in 1988) Description of the range ecosystems of North America with a discussion of the major uses of each, including watershed values, and the problems of management on private ranches and on public and reclaimed lands. The major range plants and animals of each region will be studied including the ecology, forage value and management response of important range plant species. Desirable antecedents: 300, Bot 301, 305.

**323 Range Measurements 2(2,0) AY S**

(Offered in 1987) Principles of sampling and measurements of important characteristics of range ecosystems. Special attention given to measurement of attributes of soil, vegetation and grazing animals for the management of public and private rangeland for multiple uses (including watershed values) and for the documentation of the reclamation of surface-mined lands. Remote Sensing applications are discussed. Desirable antecedents: 300, Stat 341.



### 324 Range Surveys 2(0,6) AY Su\*

(Offered in 1987) Surveys to determine attributes of range vegetation; to determine and map range site, range condition and trend in range condition; to determine and map utilization patterns; to determine potential stocking rates for grazing animals; to document changes in response to management of ecosystem characteristics. Ecological characteristics and field recognition of important range plants stressed. Remote sensing applications are used. Desirable antecedents: 323, PS 310.

### 411 Range Improvement 2(2,0) AY F

(Offered in 1988) Management of private and public ranges for optimum biological and economic output, considering various products and values including watershed values. Emphasis on the planning application and effect of grazing management, fire management, tillage, seeding, plant control, and related practices for range improvement and reclamation. Desirable antecedents: 200 or 300.

### 421 Field Studies in Range Science 2(0,4) AY Su\*

(Offered in 1988) Extended field trip to study major range ecosystems of the plains, mountains and intermountain basins. Major uses (including watershed values) and management problems of private ranches, public lands and mining lands will be studied. Field recognition and ecological characteristics of range plants and animals is stressed. P, consent of instructor.

### 470 Range Management Planning On Public Lands 2(1,2) AY S

(Offered in 1987) Range management planning in the context of state and federal lands. Selection of ecologically sound alternative management strategies for multiple uses (including watershed values) considering economic, legal, ethical, sociological, political, institutional and historic influences.

### 471 Range Management Planning for Ranchers 2(1,2) AY S

(Offered in 1988) Range management planning in the context of operating ranches. Microcomputers will be used for comparison of management strategies, optimum production of various uses using biological, economic and social criteria. Desirable antecedent: 411.

### 494-495-496 Cooperative Education/Internship/Field Experience 1-12 FSSu

Supervised experience in range management activities for exposure to range management problems and solutions, evaluation of career objectives and final career planning. P, consent of program coordinator.

\*See footnote on scheduling on Range classes.

\*\*All courses listed with desirable antecedents will be taught assuming subject matter knowledge in those desired courses.

## Graduate Courses

### 581-681 Range Science Seminar 1(1,0) AY S

(Offered in 1987) Review of current literature, research programs, and action programs in the management and the use of rangelands. Desirable antecedent: 300.

### 591-691 Research Problems in Range Science 1-3 FSSu

Investigation of problems in Range Science with results submitted as a technical paper.

### 592-692 Special Topics 1-3 FSSu

Advanced study of one or more selected topics in Range Science.

## Army ROTC

(See page 135, Military Science)

## Biochemistry (See Chemistry)

## Biology (Bio)

Including the areas of Botany (Bot) and Zoology (Zool)

## College of Agriculture and Biological Sciences

Professor McMullen, Acting Head Professors Chen, Granholm, Haertel, J., Holden, McMullen, Myers, Peterson; Professors Emeritus Hartwig, Huggins, Morgan, Taylor; Associate Professors

Haertel, L., Hutcheson, Larson, Morrill, Olson, Whalen, Wilkin; Instructor Trautman.

The Biology Department offers curricula leading to the Bachelor's degree with majors in biology, botany, environmental management and zoology. Flexibility in the curricula allows you to follow pre-professional programs such as medicine, dentistry and optometry (see College of General Registration for details) or second majors in such fields as Microbiology, Chemistry, Clinical (Medical) Laboratory Technology (see coordinator of CLT program in Chemistry Department) and Physical Therapy (see coordinator of PT program in HPER). The Department offers a program for teaching in secondary schools through substitution of education courses for general electives.

The courses taught in this department are designed to: 1) prepare you for specific fields in biological science; 2) provide fundamental principles for advanced work in various fields of the biological sciences, agriculture and health professions; 3) present the general biological principles required to comprehend the complexities of living systems and their interactions.

## Biology (Bio)

Courses of the Biology major core curriculum, Bio 151-153, Bot 201, Zool 203, Bio 211, Bio 343 and Bio 371 form a foundation upon which specialized areas can be built. The biological science electives selected to build around this "core" may be taken in departments other than Biology such as Microbiology, Horticulture, Wildlife and Fisheries Science, Plant Science and Animal Science. Depending upon your background and needs, the undergraduate Biology major has several different programs from which to choose: The B.S. in Biological Science, the B.S. in Arts and Science, and the B.A. in Arts and Science.

For those planning to teach Biology in the secondary schools, the department recommends that chemistry and/or mathematics be considered as minor fields since combination science and math teachers are usually in greater demand than full-time biology instructors. Biology majors, with the proper selection of a curriculum, are well prepared to enter graduate school in the biological sciences. The biology major is excellent preparation for the health-related professional schools or entry into occupations related to life science in government and the private sector.

The minor in Biology consists of Bio 151, 153, 211, 343, 371; Bot 201; Zool 203. It is recommended that one semester of Chemistry, Physics and Microbiology be taken.

## Botany (Bot)

Botany is the scientific study of plants. The science explores how plants function from the molecular to the ecosystem level (physiology and ecology), how they are organized as living things (anatomy) and how they are named, classified and identified (taxonomy). Introductory courses in Botany are intended to expand your cultural background in plant biology and to give you an appreciation for their diversity and their roles in the environment and economic life. Other courses are intended to prepare you for more specialized courses in Botany and related fields such as Agronomy, Horticulture and Forestry.

The graduate with a major in Botany is qualified for professions in plant research, plant industry and teaching. Graduates wishing to pursue a career in a specialized area of Botany are encouraged to consider an advanced degree program. In all cases the programs in Botany are designed to provide the student with an appreciation of the Green World.

The minor in Botany must include Bio 151, Bot 200 or 201, 301, 415 and 421.

## Zoology (Zool)

Zoology is a broad area of scientific activity that encompasses the study of every aspect of animal life. Among the basic disciplines

are morphology (both gross and microscopic anatomy), development (genetics and embryology), physiology, ecology, behavior, and parasitology. Included within these disciplines are many important aspects such as environmental relationships and systematics, which is concerned with the identification, classification, and evolutionary relationships of the vast array of animals, both vertebrate and invertebrate. Zoology provides the basis for many related disciplines, such as medicine and the health sciences, veterinary science, and oceanography, and is a good undergraduate major for those wanting to enter those fields.

Graduates frequently pursue advanced degree programs which enhance their employment opportunities in federal and state government agencies, private research laboratories, educational institutions, health professions, museums, and zoological parks. The Zoology program also provides for persons having a purely cultural interest in the field; it is a branch of knowledge which can enrich the life of the educated person.

The **minor in Zoology** must include Bio 151, 371, Zool 357, 365 plus department approved courses to total a minimum of 17 credits.

## Environmental Management (Env Mgmt)

The Environmental Management Major is designed to prepare you for careers in government, industry, recreation or for graduate study in environmental sciences. It is desirable for environmental management majors to develop a second area of specialization depending on the student's area of interest. Useful 2nd majors or minors include: Biology, Chemistry, Computer Science, Engineering, Forestry, Microbiology, Parks and Recreation, Plant Science, Range Management, and Wildlife Management. A two year associate degree program in General Agriculture, with emphasis in Environmental Management is available in the department. See Associate degree description in General Agriculture for more details.

## Graduate Study

The department offers majors in Biology and Zoology under the M.S. degree. The major in Biology is a multidepartmental program which allows the student breadth of coursework at the graduate level while specializing in the thesis or research paper area. For further information consult the graduate bulletin.

### Curriculum in Biological Science Biology Major Leading to the Bachelor of Science Degree

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp. Engl 101 .....	3	
Fund of Speech, SpCm 101 .....		3
Fitness & Lifetime Activities, PE 100 .....	1	1
Gen Chem, Chem 112, 114 .....	4	4
Algebra and Trig, Math 113 (or Algebra, Math 111 & Plane Trig, Math 120) .....	5	
Intro Biology, Bio 151, 153 .....	3	3
Electives (recommend Math 123 or 222) .....		5
<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Macroeconomic Principles, Econ. 201 .....		3
Organic Chem, Chem 120 & Chem elective (Recommend Chem 260); or Organic Chem, Chem 222, 224 .....	4	4
Gen Microbiology, Micro 231 .....	4	
Prin of Ecology, Bio 211 .....	3	
Plant Kingdom, Bot 201 .....		3
Animal Kingdom, Zool 203 (or Zool 357 & 365) .....	3	
Intro to Sociology, Soc 100 .....		3
Social Science elective (approved list) .....		3
*Elective .....	2	
<b>Junior Year</b>	<b>F</b>	<b>S</b>
Junior Composition, Engl 300 .....		3

Elementary Physics, Phys 111-113 .....	4	4
Genetics, Bio 371 .....	3	
Cell Biology, Bio 343 .....		3
Humanities electives (approved list) .....	3	3
Electives in Biological Sciences .....	3	
Elective (recommend Statistical Methods I, Stat 341) .....	3	
*Elective (recommend Histological Techniques, Bio 445) .....		3

<b>Senior Year</b>	<b>F</b>	<b>S</b>
Communications Elective (recommend Writing in the Sciences, Engl 307) .....	2	
Seminar, Bio 492 .....	1	
Electives in Biological Sciences .....	3-4	
Physiology elective, Bot 427 or Zool 325 .....		4
*Electives (recommend Biological Science courses; CSc 271) .....	9-10	12

\*The college of Agriculture and Biological Sciences requires that at least 25 semester credits of the 128 total for graduation be upper division (300 and above). If you plan to teach Biology with this curriculum, see Education Curriculum for Teachers of Academic Subjects and consult with Dean of Education. SeED 416 required for teaching option. Bio 373, Evolution, is highly recommended.

### Curriculum in Arts and Science, Biology Major Leading to the Bachelor of Science Degree

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp, Engl 101 .....	3	
Fund of Speech, SpCm 101 .....		3
Fitness & Lifetime Activities, PE 100 .....	1	1
Gen Chem, Chem 112-114 .....	4	4
Algebra & Trig, Math 113 (or Algebra, Math 111 & Plane Trig, Math 120) .....		5
Intro Biology, Bio 151, 153 .....	3	3
Social Science (approved list: two areas) .....	3	
Elective .....	2	

<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
†Humanities elective (approved list: two areas) .....	4	
Organic Chemistry, Chem 120 & Chem elective (Recommend Chem 260); or Organic Chem 222, 224 .....	4	4
General Microbiology, Micro 231 .....		4
Principles of Ecology, Bio 211 .....	3	
Plant Kingdom, Bot 201 .....		3
Animal Kingdom, Zool 203 (or Zool 357 & 365) .....	3	
Social Science elective (approved list: two areas) .....		3
Electives .....	2	2

<b>Junior Year</b>	<b>F</b>	<b>S</b>
Junior Composition, Engl 300 .....	3	
Elementary Physics, 111-113 .....	4	4
Genetics, Bio 371 .....	3	
Cell Biology, Bio 343 .....		3
Electives in Biological Sciences .....	3	
Social Science electives (approved list: two areas) .....	3	3
Humanities elective (approved list: two areas) .....		5
*Electives .....		1

<b>Senior Year</b>	<b>F</b>	<b>S</b>
Seminar, Bio 492 .....	1	
Electives in Biological Sciences .....	3-4	
Physiology elective, Bot 427 or Zool 325 .....		4
*Electives (recommend Biological Science courses; Biochemistry, Chem 260; Statistical Methods, Stat 341 in Fall; Histological Techniques, Bio 445 in Spring) .....	11-12	12

\*The college of Arts and Sciences requires that at least 40 semester credits of the 128 total for graduation be upper division (300 and above).

If a student plans to teach Biology with this curriculum, see Education Curriculum for Teachers of Academic Subjects and consult with Dean of Education. SeEd 416 required for teaching option. Bio 373. Evolution, is highly recommended.

†The College of Arts and Science requires two courses which concentrate on the humanities and social science aspects of an international area. These courses may be used to partially satisfy the social science and humanities requirements. (See International Studies list.)

**Curriculum in Arts and Science, Biology Major**  
Leading to the Bachelor of Arts Degree

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp, Engl 101.....	3	
Fund of Speech, SpCm 101.....		3
Fitness & Lifetime Activities, PE 100.....	1	1
Gen Chem, Chem 112-114.....	4	4
Algebra & Trig, Math 113 (or Algebra, Math 111 & Plane Trig, Math 120).....		5
Intro Biology, Bio 151, 153.....	3	3
Humanities elective (approved list: two areas)	4	
*Elective.....	1	

<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
†Social Science elective (approved list: two areas).....		4
Organic Chem, Chem 120 and Chem elective (Recommend Chem 260); or Organic Chem, Chem 222, 224.....	4	4
General Microbiology, Micro 231.....	4	
Principles of Ecology, Bio 211.....	3	
Plant Kingdom, Bot 201.....		3
Foreign Language.....	4	4
Animal Kingdom, Zool 203.....	3	

<b>Junior Year</b>	<b>F</b>	<b>S</b>
Junior Comp, Engl 300.....	3	
Elementary Physics, Phys 111-113.....	4	4
Cell Biology, Bio 343.....		3
Genetics, Bio 371.....	3	
*Electives in Biological Sciences.....		3-4
Foreign Language.....	3	3
*Electives.....	3	2-3

<b>Senior Year</b>	<b>F</b>	<b>S</b>
Seminar, Bio. 492.....	1	
*Electives in Biological Sciences.....	3	
Physiology elective, Bot 427 or Zool 325.....		4
*Social Science electives (Approved lists: two areas).....	4	4
†Humanities electives (Approved lists: two areas).....		2
*Electives (recommended Biological Science courses; Statistical Methods, Stat 341; CSc 271; Math 222).....	7	6

\*The college of Arts and Science requests that at least 40 semester credits of the 128 total for graduation be upper division (300 and above).

If a student plans to teach Biology with this curriculum, see Education Curriculum for Teachers of Academic Subjects and consult with Dean of Education. SeEd 416 required for teaching option.

†The College of Arts and Science requires two courses which concentrate on the humanities and social science aspects of an international area. These courses may be used to partially satisfy the social science and humanities requirements. (See International Studies list.)

**Curriculum in Biological Sciences, Botany Major**  
Leading to the Bachelor of Science Degree

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp, Engl 101.....	3	
Fund of Speech, SpCm 101.....		3
Fitness & Lifetime Activities, PE 100.....	1	1
Gen Chem, Chem 112-114.....	4	4
Algebra, Math 113 (or Algebra, Math 111 & Plane Trig, Math 120).....		5
Intro Biology, Bio 151, 153.....	3	3
Electives.....		5

<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Intro to Sociology, Soc 100.....	3	
Macroeconomics Principles, Econ 201.....		3

Plant Structure and Function, Bot 200.....		3
Plant Kingdom, Bot 201.....		3
Organic Chem, Chem 120.....	4	
Elementary Biochem, Chem 260.....		4
Humanities electives.....	3	3
Electives.....	6	3

<b>Junior Year</b>	<b>F</b>	<b>S</b>
Junior Comp, Engl 300.....	3	
Microbiology, Micro 231.....	3	
Elementary Physics, Phys 111-113.....	4	4
Genetics, Bio 371.....		3
Plant Taxonomy, Bot 301.....		4
Communications Elective (recommend Writing in the Sciences, Engl 307).....		2
*Social Science Elective.....	3	
*Electives.....	3	3

<b>Senior Year</b>	<b>F</b>	<b>S</b>
Plant Ecology, Bot 415.....	4	
Plant Anatomy, Bot 421.....	3	
Plant Physiology, Bot 427.....	4	
Histological Techniques, Bio 445.....		3
Seminar, Bio 492.....		1
Zoology Elective.....		4
*Electives.....	5	8

\*The college of Agriculture and Biological Sciences requires that at least 25 semester credits of the 128 total for graduation be upper division (300 and above).

**Curriculum in Arts and Science, Botany Major**  
Leading to the Bachelor of Science Degree

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp, Engl 101.....	3	
Fund of Speech, SpCm 101.....		3
Fitness & Lifetime Activities, PE 100.....	1	1
Gen Chem, Chem 112-114.....	4	4
Algebra & Trig, Math 113 (or Algebra, Math 111 & Plane Trig, Math 120).....		5
Intro Biology, Bio 151, 153.....	3	3
†Social Science (Approved List: two areas).....	3	
Electives.....	2	

<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
†Social Science (Approved List: two areas).....	6	3
Plant Structure & Function, Bot 200.....		3
Plant Kingdom, Bot 201.....		3
Organic Chem, Chem 120.....	4	
Microbiology, Micro 231.....		4
†Humanities elective (Approved list: two areas).....	6	3

<b>Junior Year</b>	<b>F</b>	<b>S</b>
Junior Comp, Engl 300.....	3	
Genetics, Bio 371.....	4	
Plant Taxonomy, Bot 301.....		4
Zoology Elective.....		4
Chem elective (Recommend Chem 260).....	4	
Elementary Physics, Phys 111-113.....	4	4
Histological Techniques, Bio 445.....		3
*Electives.....		1

<b>Senior Year</b>	<b>F</b>	<b>S</b>
Plant Ecology, Bot 415.....	4	
Plant Anatomy, Bot 421.....	3	
Plant Physiology, Bot 427.....	4	
Seminar, Bio 492.....		1
*Electives.....	5	15

\*The college of Arts and Science requires that at least 40 semester credits of the 128 total for graduation be upper division (300 and above).

†The College of Arts and Science requires two courses which concentrate on the humanities and social science aspects of an international area. These courses may be used to partially satisfy the social science and humanities requirements. (See International Studies list.)

**Curriculum in Biological Science,  
Environmental Management Major**  
Leading to a Bachelor of Science Degree

<b>Freshman Year</b>	<b>F</b>
Fr Comp, Engl 101.....	3
Fitness & Lifetime Activities, PE 100.....	1
Intro Biology, Bio 151, 153.....	3
Gen Chem, Chem 112-114.....	4
Algebra & Trig: Math 113 (or Math 111; Math 120).....	5
Fund of Speech, SpCm 100.....	3
Intro to Sociology, Soc 100.....	3
Electives (from Approved List)**.....	2

<b>Sophomore Year</b>	<b>F</b>
Prin of Ecology, Bio 211.....	3
Organic Chem, Chem 120 & Chem elective (Recommend Chem 260); or Organic Chem, Chem 222, 224.....	4
Soils, PS 113.....	3
Elementary Physics, Phys 111-113 (or Phys 211-213).....	4
Gen Microbiology, Micr 231.....	4
Macroeconomics Principles, Econ 201.....	3
Electives§.....	2

<b>Junior Year</b>	<b>F</b>
Geology, PS 243.....	3
Phys Climatology & Meteorology, AE 353.....	3
Genetics, Bio 371.....	3
Junior Comp, Engl 300.....	3
Communications Elective*.....	2
Conservation & Management of Soils, PS 372.....	2
Social Science Elective.....	3
Electives (from Approved List)**.....	2
Electives§.....	4

<b>Senior Year</b>	<b>F</b>
Seminars†.....	1
Humanities Electives.....	3
Electives (from Approved List)**.....	7
Electives§.....	5

\*Communications elective to be selected from the following: Engl 307, 393; MCom 210, 313, 315, 330, 331, 335; SpCm 315, 334, 335.

\*\*Approved List. Twenty-five hours of electives must be chosen from the following courses: AE 464, 503; Bio 295, 343, 353, 372, 373, 551, 597; Bot 201, 301, 305, 415, 427, 505; Chem 232, 340, 341, 352, 380; CSc 271; F 131, 232, 331; Geog 464; HSc 440, 432, 443; La 324, 443; MA 463; Micr 310, 412, 422; PS 223, 305, 310, 322, 352, 483, 511, 521, 524; Pols 320, 408; Rang 300, 321, 411, 421, 470, 471; Soc 362; Stat 341; WL 210, 363, 367, 411, 412; Zool 203, 325, 355, 357, 365, 467.

†Seminars may be elected in Animal Science, Biology, Microbiology, Plant Science or any other department interested in an environment topic. See instructor of appropriate seminar for details.

§Suggested List. General electives may come from any department listing in catalog but some suggested electives are: CSc 112, 212, 271; WL 511-611.

**Curriculum in Biological Science, Zoology Major**  
Leading to the Bachelor of Science Degree

<b>Freshman Year</b>	<b>F</b>
Intro Biology, Bio 151, 153.....	3
Fr Comp, Engl 101.....	3
Fund of Speech, SpCm 101.....	3
Fitness & Lifetime Activities, PE 100.....	1
Gen Chem, Chem 112-114.....	4
Intro to Sociology, Soc 100.....	3
Algebra & Trig, Math 113 or Math 111-120..	5
*Electives.....	2

<b>Sophomore Year</b>	<b>F</b>
Elementary Physics, Phys 111-113.....	4
Macroeconomics Principles, Econ 201.....	3
Elementary Organic Chemistry, Chem 120.....	4
Elementary Biochem, Chem 260.....	4
Prin of Ecology, Bio 211.....	3
Humanities (from approved list).....	3
Electives.....	2

General Microbiology, Micr 231.....	4
<b>Junior Year</b>	<b>F</b>
Vertebrate Zoology, Zool 365.....	4
Invertebrate Zoology, Zool 357.....	4
Embryology, Zool 383.....	4
Mammalian Physiology, Zool 325.....	4
Genetics, Bio 371.....	3
Jr Comp, Engl 300.....	3
*Electives (from approved list).....	2
Humanities electives (approved list).....	3

<b>Senior Year</b>	<b>F</b>
Communications elective (from list under Core Curriculum in Biol Sco).....	2
Social Science (from approved list).....	3
Vertebrate Histology, Zool 441.....	3
Elective (Recommend Statistical Methods, Stat 341).....	3
Seminar, Bio 492.....	1
*Electives.....	10

\*Any course in the General Catalog but recommend the following: Bio 373 and 445; and other courses with Bio or Zool prefix; WL 363, 367; Micr 310, 422, 423, 536. The College of Agriculture and Biological Sciences requires that at least 25 semester credits of the 128 total for graduation be upper division (300 or above). If a student plans to teach Biology with this curriculum, see Education Curriculum for Teachers of Academic Subjects and consult with Dean of Education. SeEd 416 required for teaching option.

**Curriculum in Arts and Science, Zoology Major**  
Leading to the Bachelor of Science Degree

<b>Freshman Year</b>	<b>F</b>
Intro Biology, Bio 151, 153.....	3
Algebra and Trig, Math 113 (or Algebra, Math 111 and Plane Trig, Math 120).....	5
Fr Comp, Engl 101.....	3
Fund of Speech, SpCm 101.....	3
Fitness & Lifetime Activities, PE 100.....	1
Gen Chem, Chem 112-114.....	4
Electives.....	1

<b>Sophomore Year</b>	<b>F</b>
Elementary Physics, Phys 111-113.....	4
Organic Chem, Chem 120 & Chem elective (Recommend Chem 260); or Organic Chem, Chem 222, 224.....	4
Social Science (from Approved List).....	3
†Humanities (from Approved List).....	3
Prin of Ecology, Bio 211.....	3
Anatomy, Zool 221.....	3
*Electives.....	2

<b>Junior Year</b>	<b>F</b>
Vertebrate Zoology, Zool 365.....	4
Invertebrate Zoology, Zool 357.....	4
Embryology, Zool 383.....	4
Mammalian Physiology, Zool 325.....	4
Genetics, Bio 371.....	3
Jr Comp, Engl 300.....	3
Social Science (from Approved List).....	3
† Humanities (from Approved List).....	3
**Electives (see Approved List).....	2

<b>Senior Year</b>	<b>F</b>
Vertebrate Histology, Zool 441.....	3
Histological Techniques, Bio 445.....	3
Internship, Bio 495.....	1
Elective (recommend Statistical Methods, Stat 341).....	3
Social Science (from Approved List).....	3
† Humanities (from Approved List).....	3
Seminar, Bio 492.....	1
**Electives (see Approved List).....	6

\*General Electives may come from any department listing in the catalog. A suggested elective is CSc 271.

\*\*Fifteen hours of electives must be chosen from the following: Any course with Bio, or Zool Prefix: WL 363, 367; Micr 231, 310, 422, 423, 536.

The College of Arts & Sciences requires that at least 40 semester credits of the 128 total for graduation be upper division (300 and above).

†The College of Arts and Science requires two courses which concentrate on the humanities and social science aspects of an international area. These courses may be used to partially satisfy the social science and humanities requirements. See International Studies list.

## Biology (Bio) Undergraduate Courses

### 101 Introduction to Biology 4(3,3) FS

An introduction to the biological concepts common to our life forms, including humans. Emphasis on the cell, genetics, structure and function, development, evolution, behavior and ecological adaptations. Intended for those not majoring in Biology or related fields. Duplicate credit for Bio 101 and 151 not allowed. B average in 101 will serve as prerequisite for subsequent Biology dept. courses requiring Bio 151 as P.

### 151 Introductory Biology 3(2,3) FSSu

Fundamental concepts: the cell structure, function, chemistry and reproduction; molecular and Mendelian genetics; plant and animal diversity through evolution; and ecology.

### 153 Introductory Biology 3(2,3) FSSu

Animal embryology; plant life cycles, hormonal and environmental influenced growth processes, structure of roots, stems, leaves; animal physiology. P, Bio 151.

### 211 Principles of Ecology 3(3,0) F

Environmental interactions with organisms, populations and communities; population interactions and evolution, community organization and succession, energy flow, biogeochemical cycles; human ecology. P, Bio 151 and 3 hrs. Bioscience.

### 271 Heredity & Society 2(2,0) FS

Principles of heredity with emphasis on humans. May not be substituted for Bio 371 and credit will not be granted for both.

### 295 Biological Literature 1(1,0) F

Literature sources used in various phases of biological research; scientific journals, periodicals, indices, abstracting services; preparation and use of bibliographies. P, one Bot or one Zool course.

### 343 Cell Biology 3(2,2) S

Cell structure and function with laboratory techniques of culturing and handling cells. P, Bio 151, Chem 120.

### 353 Intro to Oceanography 3(3,0) S

Physical chemical, geological and biological aspects of oceanography. Ocean resource use. P, 1 year college science.

### 371 Genetics 3(3,0) FSSu

Principles governing the nature, transmission and function of hereditary material with application to plants, animals, humans, and microorganisms. P, Bio 151 and either Bio 153 or Bot 201 or Zool 203.

### 372 Genetics Laboratory 1(0,2) FS

Experiments with *Drosophila* and other organisms, illustrating probability, meiosis, sex linkage, independent assortment, crossing over, interference and biochemical genetics. To be taken concurrently with Bio 371, but not required for 371.

### 373 Evolution 3(3,0) S

Provides an understanding of the processes which have brought about long-term changes in living systems. Surveys evidences of plant and animal evolution, achievement in evolution theory and examines mechanisms responsible for genetic change. P, Bio 151.

### 383 Bioethics 4(4,0) F

Ethical, social and policy dilemmas in medicine and biology. P, Bio 151. Cross-listed as Phil 383.

### 445 Histological Techniques 3(1,6) S

Preparing animal and plant tissue sections and slides for microscopic and photomicrographic study. P, Bio 151.

### 490 Seminar 1(1,0) FS

Presentation of topics based on biological literature in scientific journals. P, three years of coursework.

### 492 Biological Problems 1-4 FSSu

Individually assigned investigative problems in biology. P, Bio 151.

### 494-495-496 Cooperative Education Internship Field Experience 1-12 FSSu

You will have an opportunity to become involved in off-campus activity which promises to contribute to your education. Acceptance based on availability of experiences and permission of departmental staff.

## Graduate Courses

### 507-607 Principles & Techniques in Electron Microscopy 3 (2,4)FS

Techniques and instruments basic to the preparation, examination and interpretation of specimens with the electron microscope.

### 525-625 Biology of Aging 2(2,0)F

Physical, sensory, and physiological changes with age. Aging of cells and tissues. Cellular, developmental, endocrine and other theories of aging. Pathologies of aging. P, undergraduate physiology course.

### 551-651 Biology of Algae 4(2,6) S(even-numbered years)

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.

### 553-653 Advanced Genetics 3(3,0)F (cross-listed with Plant Science)

### 573-673 Cytogenetics 3(2,3) F (odd-numbered years)

To study the nature and behavior of chromosomes in relation to heredity. (Cross-listed PS 573-673).

### 595-695 Strategies in Science Teaching 3(3,0) F

Training in identifying and teaching certain processes deemed fundamental to science and scientific behavior. (Cross-listed SeEd 416).

### 597-697 Special Topics (1-5) FS

### 790 Thesis in Biology (5-7) FSSu

### 792 Graduate Seminar 1(1,0) FSSu

### 793 Biological Research Problems 1-3 FSSu

## Botany (Bot) Undergraduate Courses

### 200 Plant Structure and Function 3(2,2) S

Introductory treatment of the structural organization and related functions of plant cells, tissue systems, leaves, roots, stems, flowers, fruits and seeds. P, Bio 151.

### 201 Plant Kingdom 3(2,2) S

Survey of the major plant groups, their origins and evolutionary contributions. P, Bio 151.

### 301 Plant Taxonomy 4(2,4) S

Principles of phylogeny, classification and nomenclature; demonstrations, field study and laboratory practice in collecting, preserving and identifying plants. P, Bio 153 or Bot 200 or Bot 201.

### 305 Agrostology 3(1,4) F

Systematic study of grasses, their classification and nomenclature; laboratory practice in recognition and identification of grasses. P, Bio 153 or Bot 200 or Bot 201.

### 415 Plant Ecology 4(3,2) F

Descriptions of plant communities, their dynamics and distribution. Environmental factors and their relationships with plants. Field trips. P, Bio 153 or Bot 200 or Bot 201.

### 421 Plant Anatomy 3(2,3) F

Developmental anatomy of seed plant axis and its appendages. Structural fitness of tissues and organs for functions they perform. P, Bio 153 or Bot 200 or Bot 201.

### 427 Plant Physiology 4(2,4) F

Plant functions and adjustments. P, Bio 151, 153 or Bot 200 or Bot 201, desirable antecedent Chem 120.

## Graduate Courses

### 505-605 Aquatic Plants 3(1,4)F (Even-numbered years)

A systematic survey of vascular plants that grow in wetland habitats and a study of their adaptations to life in the water. Field and laboratory practice in identification and recognition of common aquatic plants. P, Bot 301, or consent of instructor.

### 515-615 Advanced Plant Ecology 4(2,3) S

Analysis of the energy relationships of communities with emphasis on productivity. Literature readings. Laboratory work in techniques of community analysis. P, consent.

### 527-627 Advanced Plant Physiology 4(2,4) S (Even-numbered years)

Role of organic and inorganic compounds in plant nutrition. P, Bot 427, Chem 120.

### 581-681 Plant Tissue Culture 3(2,3) F (Even-numbered years)

Comparative studies of in vivo and in vitro cellular differentiation, organ formation, and plant development. P, Bot 421 or 427 or Bio 371.

### 585-685 Growth and Development 4(2,4) S (Odd-numbered years)

Relations of light, temperature, water, wind, growth regulators, nutrients and other factors to various stages of plant growth and development. P, Bot 427, Chem 120.

### 597-697 Special Topics FS

Advanced Plant Anatomy, Morphology of Non-Vascular Plants, Morphology of Vascular Plants, Plant Taxonomy.

## Zoology (Zool) Undergraduate Courses

### 123 Survey of Anatomy and Physiology 3(3,0) FS

General structure and function of the human body to provide a basic knowledge for the non-science student. Not to be considered as a prerequisite for other zoology courses. Credit may be earned in Zool 123 and Zool 221 only if these two courses are taken in that order.

### 203 Animal Kingdom 3(2,2) FS

Principles of animal classification, the theories of evolution, how animals grow and reproduce, and distribution of animal life. Provides an understanding of kinds and numbers of animals, structure of representatives of different groups, body processes and ways that animals live. P, Bio 151.

### 221 Anatomy 3(2,3) FSSu

Structure of various systems of the body as basis for physiology. Models and charts are used with references to skeletons. Injected and embalmed rats are used for a limited amount of dissection.

### 301 Animal Behavior 3(2,2) F

Animal behavior from many aspects, including communication, social organization, orientation, imprinting, courtship and mating, agonistic behavior, control systems, and the evolution of behavior patterns. P, Bio 151 or consent.

### 307 Introduction to Medical Science 3(3,0) FS

Biochemical, functional and structural changes in body tissue in relation to the disease process. Pathophysiology of human organ systems. Clinical manifestations of disease. P, Zool 325.

### 325 Mammalian Physiology 4(3,3) FS

Basic cell physiology. Neural, hormonal and neuroendocrine control systems. Coordinated body functions. P, 8 credit hrs. of Chemistry and Zool 221 or consent.

### 355 Mammalogy 3(2,2) F

Identification of game, furbearing, and small mammals; taxonomy of these groups, life histories and habits, preparation of study skins and skeletons; special reference to those occurring in Northern Great Plains areas. P, Bio 151.

### 357 Invertebrate Zoology 4(3,2) S

Phyla of invertebrate animals, emphasis on taxonomy, morphology, ecology, phylogenetic relationships, and economic importance. Some field work. P, Bio 151.

### 365 Vertebrate Zoology 4(3,2) F

Structure and ways of life of the vertebrate classes. General anatomy, organ systems, and special characteristics of each class of vertebrates as well as detailed classification of the major taxa down to the family level. P, Bio 151.

### 383 Embryology 4(2,4) S

Classical and current concepts of embryology. Introduction and elementary aspects of embryological development in the animal kingdom. P, Bio 151. Bio 371 desirable antecedent.

### 393 Insects Affecting Man and Animals 3(2,2) F

Relationship of arthropods (insects, ticks, mites and relatives) to disease in man (public health) with emphasis on the Northern Great Plains. Open to upperclassmen in Health Science, Entomology, Microbiology, Veterinary Science or Zoology. (Cross-listed as PS 393).

### 441 Vertebrate Histology 4(2,5) F

Microscopic study of cells and fundamental tissues. Structures of organs and systems are stressed to integrate structure and function. P, Bio 151.

### 457 Comparative Vertebrate Anatomy 4(2,4) S

Theories of origin of Cordates and Vertebrates. Comparative analysis of vertebrate systems as they occur in various groups. Early Cordates and Vertebrates, lamprey, shark, Necturus, and cat comprise laboratory specimens. P, Zool 203.

### 467 General Parasitology 3(2,2) S

The broad field of animal parasitology, including protozoa, helminths, and arthropods. Emphasis on identification, life histories, control, and economic and medical importance. Laboratory includes morphology and identification of representative groups of parasites, as well as techniques of diagnosis of parasitic disease. P, Bio 151.

### 493 Special Topics in Zoology FSSu

(As arranged) Qualified students may investigate special topics under supervision of department staff in the following and other selected areas: Human Genetics, Principles of Animal Taxonomy, Helminthology, Herpetology.

## Graduate Courses

### 523-623 Insect Physiology 3(2,2) S

Fundamental physiological processes in insects. Normal and abnormal functioning of adult and immature stages, developmental physiology, physiology of behavior. P, Chem 120 and consent.

### 721 Mammalian Anatomy 4(2,6)

### 723 Systemic Physiology 4(3,3)

Cross-listed as Vet Sci 723.

### 725 Systemic Physiology 4(3,3)

Cross-listed as Vet Sci 725.

### 727 Endocrinology 4(3,3)

Cross-listed as Vet Sci 727.

### 790 M.S. Thesis in Zoology

### 792 Graduate Seminar in Zoology 1

### 797 Special Topics in Zoology

## Business Area Studies

The following group of business related courses represents offerings from all academic departments (or in cooperation with other institutions) of interest to majors in the various business related curricula of the university. They are particularly useful as an adjunct to majors in agri-business, agricultural economics, agronomy, animal science, commercial economics, crop science, dairy manufacturing, dairy production, economics, horticulture, interior design, mechanized agriculture, pest management, printing management, pharmacy, restaurant management, soil science, textiles and clothing, and for those following the various engineering major curricula.

### Undergraduate Courses

#### Accounting (Actg)

### 210 Principles of Accounting I 3(3,0) FS

### 211 Principles of Accounting II 3(3,0) F

#### Business Administration (B-Ad)

### 310 Business Finance 3(3,0) FS

### 326 Operations Research 4(4,0) FS

### 350 Business Law I 3(3,0) FS

### 351 Business Law II 3(3,0) FS

### 360 Business Management 3(3,0) FS

### 380 Personal Finance 3(3,0) FS

#### Computer Science (CSc)

### 271 Computer Programming 4(3,2) FS

### 313 COBOL Programming 3(2,2) F

#### Economics (Econ)

### 353 Marketing 3(3,0) FS

### 382 Labor, Law and Economics 3(3,0) F

### 391 Consumers and the Market 3(3,0) FS

### 427 Managerial Economics 3(3,0) FS

### 452 Marketing Management 3(3,0) S

### 453 Risk Management — Personal and Business 3(3,0) F

#### Geography (Geog)

### 454 Industrial and Commercial Site Selection 3(3,0) FS

#### Mathematics (Math)

### 241 Mathematics of Finance 3(3,0) S

#### Mass Communications (MCom)

### 313 Publicity Methods 2(2,0) FSSu

### 370 Principles of Advertising 3(3,0) F

#### Political Science (PolS)

### 428 Personnel and Budgetary Administration 3(3,0) S

#### Printing (Prtg)

### 312 Media Personnel Management 3(3,0) FS

### 313 Media Labor Management 3(3,0) S

### 314 Sales Promotional Circulation 3(3,0) FS

#### Psychology (Psyc)

### 331 Business and Industrial Psychology 3(3,0) F

#### Speech (Sp)

### 201 Interpersonal Communication 3(3,0) S

## Chemistry (Chem) Including the area of Medical Technology (MEDT)

### College of Arts and Science

Professor Hilderbrand, Head; Professors Brandwein, Emerick, Evenson, Gehrke, Grove, Hecht, Jensen, Kenefick, Palmer, Rue, Spinar, Wadsworth; Professors Emeriti Gastler, Greb, Halverson, Johnson, Klug, Mc Roberts, O. Olson, Webster, Whitehead; Associate Professors Matthees, Peach, Seymour; Assistant Professors Busch, Thiex; Instructor Pravecsek.

The Chemistry department is on the approved list of the American Chemical Society for training professional chemists. Graduates are certified to the American Chemical Society as being eligible for full membership following two years of graduate work or other experience in chemistry.

The department participates in the alternatives and options programs of the College of Arts and Science.

Department courses serve three general purposes. First, since chemistry is so closely related to other fields of study, a number of courses are offered to provide sufficient chemical background to meet professional needs. Second, a minor can be obtained by students wanting more extensive chemistry without majoring in chemistry. Third, you can major in chemistry by choosing one of the following curricula.

Note: No grade below "C" in chemistry courses will be accepted toward a major in chemistry.

#### General Chemistry

The general chemistry curriculum prepares you for careers in the following: agricultural chemistry, chemical business, environmental chemistry, industrial quality control, and the teaching of chemistry. These various areas will require the appropriate additional courses. For example, students who have teaching in mind should begin taking courses in education at the start of the junior year in order to meet the requirements for teachers. Majors in general chemistry may work toward either the Bachelor of Science or Bachelor of Arts degree. Students desiring to be certified to teach Chemistry must take SeEd 416, Strategies in Science.

#### Food and Nutrition Chemistry

The curriculum is designed to train you for positions in the food processing industry, Agricultural Research Service, Food and Drug Administration and to prepare you for graduate work in the field which may lead to college teaching.

#### Professional Chemistry

The curriculum in professional chemistry is intended for students planning to pursue graduate work in chemistry or to work in research in governmental or industrial laboratories. The degree is certified by the American Chemical Society.

#### Applied Chemistry Option

A student from any of the above areas may pursue an "applied chemistry" option by taking the following additional courses: Applied Chemical Instrumentation (Chem 330 — 3 credit hours), Industrial Analytical Analysis (Chem 494 — 2 credit hours), and Industrial Organic Preparations (Chem 494 — 2 credit hours). These courses may be taken during the junior and senior years. The Professional Chemistry Major may substitute Instrumental Analysis (Chem 434) for Chem 330.

#### Biochemistry

Students interested in a career in biochemistry should major in general or professional chemistry and include biochemistry courses such as Chem 260, 360, and 562 in their curriculum.

### 5-Year M.S. Programs

Plans of study have been formulated whereby you may obtain both an undergraduate degree and a Master's degree in five years (including two summer terms). You can obtain the M.S. degree in either Professional Chemistry, Biochemistry, or Agricultural Chemistry. Consult the department head if interested in this type of program.

#### Minor in Chemistry

A minor in chemistry should include: Chem 112, 114 (4 credits), 120 (4 credits), and 232 or 260, or acceptable substitutes for these. A graduation ratio of 2.0 in chemistry courses is required.

#### Graduate Study

Facilities are available in this department for graduate study leading to the Master of Science in Chemistry. See Graduate Catalog.

#### Curriculum in Arts and Science, General Chemistry Major

Leading to the Bachelor of Arts degree

Freshman Year		F	S
Fr Comp, Eng 101 and Fund of Speech, SpCm 101.....	3	3	3
Gen Chem, Chem 112-114.....	4	4	4
Mathematical Analysis, Math 123 or Calculus for non-Math Major, Math 222.....	5	5	5
Biological Science.....	3	3	3
Fitness & Lifetime Activities, PE 100.....	1	5	5
Electives*.....			5
Sophomore Year		F	S
Fund of Organic Chemistry, Chem 222-224 ...	4	4	4
Elem Physics I-II, Phys 111-113.....	4	4	4
Chemical Calculations, Chem 270.....		2	2
Electives*.....			5
Junior Year		F	S
Quantitative Analysis, Chem 232.....	4		
Physical Chemistry, Chem 340 or 342.....			3
Physical Chemistry Lab, Chem 341 or 343....			1
Junior Comp, Engl 300.....	3		
Electives*.....	9		12
Senior Year		F	S
Chemistry Elective**.....	3-4		3-4
Electives*.....	11-12		11-12

\*Electives must include 2 years of a foreign language, 1 additional humanities course, and 12 hours of social sciences. At least 1 social science course must be designated international studies. Students are also strongly urged to incorporate one of the emphasis programs listed below into their curriculum.

\*\*At least 6 hours of chemistry selected from the following courses must be taken. Chem 260, Chem 330, Chem 344, Chem 345, Chem 352, Chem 380, Chem 382, Chem 434, Chem 461.

#### Curriculum in Arts and Science,

#### General Chemistry Major

Leading to the Bachelor of Science degree

Freshman Year		F	S
Fr Comp, Eng 101 and Fund of Speech, SpCm 101.....	3	3	3
Gen Chem, Chem 112-114.....	4	4	4
Mathematical Analysis, Math 123 or Calculus for non-Math Major, Math 222.....	5	5	5
Biological Science.....	3	3	3
Fitness & Lifetime Activities, PE 100.....	1	1	1
Electives*.....			5
Sophomore Year		F	S
Fund of Organic Chemistry, Chem 222-224 ...	4	4	4
Elem Physics I-II, Phys 111-113.....	4	4	4
Chemical Calculations, Chem 270.....		2	2
Electives*.....	8		6
Junior Year		F	S
Quantitative Analysis, Chem 232.....	4		
Physical Chemistry, Chem 340 or 342.....			3
Physical Chemistry Lab, Chem 341 or 343....			1

Junior Comp, Engl 300 .....	3	
Electives* .....	9	12
<b>Senior Year</b> .....	<b>F</b>	<b>S</b>
Chemistry Elective** .....	3-4	3-4
Electives* .....	11-12	11-12

\*Electives must include 9 hours of humanities and 12 hours of social sciences. One humanities and one social science must be designated international studies. Students are strongly encouraged to incorporate into their curriculum one of the emphasis areas listed above.

\*\*At least 6 hours of chemistry selected from the following courses must be taken. Chem 260, Chem 330, Chem 344, Chem 345, Chem 352, Chem 380, Chem 382, Chem 434, Chem 461.

Suggested courses for those interested in associated careers in.

**Allied Health**

Bio 151; Zool 221, 325, 467; Micr 231, 422, 423; Chem 260, 382, 330; Stat 341; CSc 271

**Biological Sciences**

Chem 260, 330, 461; Biological Science upper division, 9 credits; Bio 151

**Education**

Chem 260, 352, 380; Educ Requirements

**Environmental**

Chem 260, 330, 380; 5 of the following: Micr 310, PS 322, Bot 415, Bio 211, Geog 337, HSc 432

**Commerce**

Chem 330, 354; Econ 201, 202, 301, 302; Stat 341

**Quality Control**

Chem 260, 330, 352; Stat 341; CSc 271

**Curriculum in Arts and Science,**

**Professional Chemistry Major**

Leading to the Bachelor of Science Degree

**Freshman Year**

Fr Comp, Engl 101 and Fund of Speech,

SpCm 101..... 3 3

Gen Chem, Chem 112-114..... 4 4

Mathematical Analysis I, Math 123..... 5 5

Mathematical Analysis II, Math 224..... 4 4

First Year German, Germ 101-102..... 4 4

Fitness and Lifetime Activities, PE 100..... 1 1

Chemical Calculations, Chem 270..... 2 2

**Sophomore Year**

Quantitative Analysis, Chem 232..... 4 4

Mathematical Elective .....

Gen Physics I-II, Phys 211-213 .....

Fundamentals of Organic Chemistry, Chem

222-224..... 4 4

Electives\*..... 1 7

**Junior Year**

Junior Comp, Engl 300 .....

Inorganic Chemistry, Chem 352 .....

Physical Chem, Chem 342-344..... 5 5

Electives\*..... 4 11

**Senior Year**

Instrumental Analysis Chem 434 .....

Advanced Chem elective..... 3 3

Advanced Physics elective..... 3 3

Electives\*..... 9 8

\*Electives must include one humanities course (not German), and 12 hours of social sciences, and 6 hours of biological sciences. At least one social science course must be designated international studies.

**Curriculum in Arts and Science,**

**Food and Nutrition Chemistry Major**

Leading to the Bachelor of Science Degree

**Freshman Year**

Fr Comp, Engl 101 and Fund of Speech,

SpCm 101..... 3 3

Gen Chem, Chem 112-114.....	4	4
Algebra and Trig, Math 113.....	5	
Foods: Principles, NFS 141.....	3	
Chemical Calculations, Chem 270.....		2
Fitness and Lifetime Activities, PE 100.....	1	1
*Elective .....		6

**Sophomore Year**

Mathematics or Statistics Elective..... 3-5 F S

Elementary Organic Chem, Chem 120..... 4 4

Quantitative Analysis, Chem 232..... 4 4

Anatomy, Zool 221 .....

General Microbiology, Micr 231 .....

Prin of Econ I, Econ 201..... 3 3

Meat Selection and Utilization, AS 249..... 2 2

Dairy Foods, DS 231 .....

Electives .....

**Junior Year**

Junior Comp, Engl 300 .....

Elementary Biochemistry, Chem 260..... 4 4

Elem or Gen Physics, Phys 111-113 or 211-

213..... 4 4

Human Nutrition, NFS 321..... 3 3

Applied Chem Instrumentation, Chem 330..... 3 3

Experimental Food, NFS 341..... 3 3

Experimental Testing and Dev. in Food Sci-

ence, NFS 342..... 3 3

Electives .....

**Senior Year**

Elementary Phy Chem, Chem 340-341 .....

Mammalian Physiology, Zool 325 .....

Food Microbiology, Micr 311 .....

Electives .....

\*A year of a foreign language is strongly recommended. See other Arts and Science requirements on pages 36-37, and University core requirements pages 15-16.

**Clinical Laboratory Technology**

Professor J. A. Grove, Coordinator

Medical Directors of Affiliated Schools of Medical Technology; Har-

old L. Frost, M.D., Rapid City Regional Hospital, Rapid City, SD;

John R. Hastings, M.D., St. Luke's Hospital, Aberdeen, SD; Barry E.

Knapp, M.D., Marian Health Center, Sioux City, IA; J. Scott Pen-

nepacker, M.D., St. Luke's Medical Center, Sioux City, IA; Wesley

Putnam, M.D., Sioux Valley Hospital, Sioux Falls, SD; John T. Tidd,

M.D., Sacred Heart Hospital, Yankton, SD. Program Directors/Edu-

cation Coordinators of Affiliated Schools of Medical Technology;

Marilyn Barnett, MT(ASCP), Sioux Valley Hospital, Sioux Falls, SD;

Etta Bassinger, MT(ASCP), St. Luke's Hospital, Aberdeen, SD;

Sharon Collier, MT(ASCP), St. Luke's Regional Medical Center,

Sioux City, IA; Bonnie Fingerhut, MT(ASCP), Rapid City Regional

Hospital, Rapid City, SD; Marjorie Miller, MT(ASCP), Sacred Heart

Hospital, Yankton, SD; Mary Puhl Smith, MT(ASCP), Marian Health

Center, Sioux City, IA.

The medical technologist is an indispensable member of the modern health team. He or she makes use of hundreds of scientific procedures devised to disclose the subtle changes that diseases produce in the body. By studying cells under the microscope, analyzing the chemical composition of body fluids and secretions, he or she can pinpoint clues to illness that might not be detected any other way. Conclusive evidence for the presence of disease as well as monitoring the success of treatment depends on laboratory findings. The medical technologist also needs to be competent in areas such as personnel and resource management, administration, teaching and research.



## Clinical Laboratory Technology at SDSU

The university offers the first three years of education experience that provides scientific background in chemistry and the biological sciences required for entrance into the clinical training program. The professional internship program, usually 12 months long, at an approved hospital laboratory school, qualifies you for the Bachelor of Science degree. The Clinical training can be obtained at the affiliated hospitals listed above or at other approved schools. Internships are awarded on the basis of academic performance, recommendations and interviews. A minimum 2.50 GPA is required by most hospitals. SDSU cannot guarantee every student an intern position. The university has affiliation agreements with the hospitals listed above to assist you in finding an internship.

### Curriculum in Arts and Science, Clinical Laboratory Technology Major Leading to the Bachelor of Science Degree

Freshman Year	F	S
Fr Comp, Engl 101 and Fund of Speech, SpCm 101.....	3	3
Gen Chem, Chem 112-114.....	4	4
Algebra, Math 111 or Algebra and Trig, Math 113.....	3-5	
Intro Biology, Bio 151.....	3	
Anatomy, Zool 221.....		3
Fitness and Lifetime Activities, PE 100.....	1	1
**Electives.....	0-2	6
<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Elem Organic Chem, Chem 120.....	4	
Biochemistry, Chem 260.....		4
Elem Physics, I-II, Phys 111-113.....	4	4
Gen Microbiology, Micro 231.....		4
**Electives.....	8	5
<b>Junior Year</b>	<b>F</b>	<b>S</b>
Introduction to Clin Lab Tech, Chem 382.....		2
Junior Comp, Engl 300.....	3	
Mammalian Physiology, Zool 325.....	4	
Quantitative Analysis, Chem 232.....	4	
Applied Chemical Instrumentation, Chem 330 Parasitology, Zool 467 or Computer Science, CSc 112.....		3 2-3
Immunology, Micro 422.....	4	
Pathogenic Microbiology, Micro 423.....		4
**Electives.....	1	4-5

### Senior Year

Twelve months training in a hospital school of Medical Technology approved by the Committee on Allied Health Education and Accreditation of the American Medical Association for which 40 semester credits will be granted. Ninety-eight (98) credit hours must be earned during the three years at SDSU.

\*\*Nine hours of humanities and twelve hours of social sciences are required. A minimum of six hours, including at least one course in humanities and one course in social sciences, must be designated 'International Studies.' Additional electives may include: Genetics, Bio 371; Calculus, Math 222; Statistical Methods I, Stat 341, Interpersonal Communications, SpCm 201.

## Clinical Laboratory Technology (MEDT) Undergraduate Courses

### Chem 382 Introduction to Clinical Laboratory Techniques.

See description under Chemistry.

### MEDT 495 Medical Technology Internship.

Students are to register for this course during the summer, fall and spring semesters of their internship year.

Credit is given by SDSU for coursework completed at affiliated hospital programs. The course descriptions below are common to most hospital programs.

### Clinical Microscopy/Urinalysis

Lecture, supervised laboratory instruction, instrumentation, and experience in body fluids and urine in regard to chemical and cellular composition. Anatomy and physiology, normal and abnormal kidney function is stressed.

### Hematology/Coagulation

Lecture, supervised laboratory instruction, instrumentation and experience in the analysis of cellular elements of the blood and bone marrow, both normal and abnormal, and on the hemostatic mechanisms of the blood.

### Microbiology

Lecture, supervised laboratory instruction, instrumentation and experience in the isolation and identification of pathogenic organisms and their susceptibility to therapeutic agents. Includes Bacteriology, Mycology, Parasitology, and Virology.

### Serology/Immunology

Lecture, supervised laboratory instruction, instrumentation and experience in applying the principles of immunology to serologic diagnosis.

### Clinical Chemistry/Special Chemistry/Body Fluids

Lecture, supervised laboratory instruction, instrumentation, and experience in medically oriented biochemistry as applied to normal and abnormal physiology and analyses of body constituents. Includes collection and analyses of special body fluids such as amniotic, synovial, cerebrospinal, gastric and pleural fluids. Includes toxicology, endocrinology, the use of radionuclides, (theory and performance of special procedures in laboratory medicine) not usually considered routine.

### Immunohematology/Blood Bank

Lecture, supervised laboratory instruction, instrumentation, and experience in theory and practice of immunohematology as applied to blood transfusion, component therapy, autoimmune diseases, immunologic diagnostic procedures and blood component preparation and administration.

### Introduction/Orientation to Med Technology

Introduction to basic techniques, safety, infection control, professional ethics, personal and professional responsibilities in the clinical laboratory. Review of program's rules and regulations. Introduction to clinical significance of laboratory procedures in diagnosis and treatment.

### Phlebotomy

Anatomy and physiology of the arm, blood collection techniques from vein, capillary, artery and difficult draw sites. Specimen variables and handling techniques. Interactive communication skills with patients and para-professionals.

### Computer Applications in the Clinical Lab

An introduction to techniques, principles, and concepts common in laboratory data processing systems. Utilization of mini-computers in the laboratory and within instruments.

### Laboratory Mathematics/Quality Assurance

Laboratory oriented mathematics with emphasis on performing calculations related to units of measure, pH, Beer's Law and calibration curves, Henderson-Hasselbach equation, enzyme activity, renal clearance, gastric acidity & hematology calculations. Principles and practices of quality assurance and control to identify and minimize problems and maintain precision and accuracy. Includes statistical techniques.

### Management/Supervision

Lectures and/or seminars on the practice of organizing, administering and supervising a clinical laboratory. Includes management theory, CAP workload statistic analysis, purchasing, interviewing, and evaluation practices.

### Educational Methodology

Lectures and/or seminars on the principles of education. Includes methods of instruction, writing objectives and evaluation devices for didactic and clinical practice.

### Introduction to Research

Faculty guided study, research, and/or projects in specialty area(s) of medical technology.

## Chemistry (Chem) Undergraduate Courses

### 100 Chemistry and Mankind 4(3,3) FS

For non-science majors. Emphasis on the appreciation of chemistry as it relates to man and the environment. Duplicate credit for Chem 100, 110 and 112 not allowed. May not be used as a prerequisite for any other course in chemistry.

### 107 Elementary Glassblowing 1(0,3) FS

Fundamental techniques: P, Consent.

### 110 General Chemistry 4(3,3) FS

A one-semester introduction to chemistry. Not intended for those needing extensive chemistry background. Duplicate credit for Chem 100, 110 and 112 not allowed.

**111 Introductory Organic and Biochemistry 5(4,3) FS**

A survey of the chemical principles important to biological systems. For students who do not plan to take additional chemistry. Not a prerequisite for any 200 level and above course. Duplicate credit for Chem 111 and 120 or 260 not allowed. P 110.

**112 General Chemistry 4(3,3) FS**

Comprehensive coverage of general chemistry. Preferred for those needing extensive background in chemistry. Duplicate credit for Chem 100, 110 and 112 not allowed.

**114 General Chemistry 3(3,0) or 4(3,3)**

Continuation of 112. P, 112 or a B average in 110.

**115 General Chemistry Lab 1(0,3) FS**

The laboratory portion of Chem 114 for those who have completed 114 for 3 credits. P, 114 (3 credits).

**120 Elementary Organic Chemistry 3(3,0) or 4(3,3) FS**

Compounds of carbon with emphasis on those of interest to students of Agriculture, Home Economics. P, 110 or 112. Duplicate credit for Chem 111, 120, 222 and 326 not allowed.

**121 Elementary Organic Chemistry Laboratory 1(0,3) FS**

The laboratory portion of Chem 120 for those who have completed 120 for 3 credits. P, 120.

**222-224 Fundamentals of Organic Chemistry 4(3,3) FS**

Comprehensive coverage of the fundamentals of organic chemistry. P, 111, 112 (4 credits). Duplicate credit for Chem 111, 120, 222 and 326 not allowed.

**232 Quantitative Analysis 4(2,6) FS**

Fundamental principles and laboratory practice in gravimetric and volumetric analysis; introduction to instrumental analysis. P, 114 (4 credits).

**260 Elementary Biochemistry 4(3,3) FS**

Introduction to biochemical processes and the study of compounds of biological interest. P, 120 (4 credits) or equivalent. Duplicate credit for Chem 111 and 260 not allowed.

**270 Chemical Calculations 2(2,0) S**

Principles of chemical calculations with computer, statistics, and calculus applications. P, 110 or 112.

**326-328 Organic Chemistry 4-5(4,0 or 4,3) FS**

Fundamentals of organic chemistry. P, 114 (4 credits). Duplicate credit for Chem 120, 222, 326 not allowed.

**327-329 Organic Chemistry Lab 1(0,3) FS**

The laboratory portion of Chem 326-328 for those who have completed 326-328 for 4 credits. P, 326-328 (4 credits).

**330 Applied Chemical Instrumentation 3(2,3) S**

Principles, practices and evaluation of quantitative instrumental methods of analysis used in agricultural, biological, clinical and engineering studies. P, 232 or consent of instructor.

**340 Elementary Physical Chemistry 3(3,0) S**

One semester introduction to the principles of physical chemistry. P, 114, 1 year of physics, Math 113.

**341 Elementary Physical Chemistry Lab 1(0,3) S**

Laboratory practice to accompany 340. P, 232, 340 or concurrent registration in 340.

**342-344 Physical Chemistry 3-5(3,0 or 3,4) FS**

Fundamentals of physical chemistry. P, 232, 1 year physics, 1 year calculus.

**343-345 Physical Chemistry Lab 2(0,4) FS**

The laboratory portion of Chem 342-344 for those who have completed 342-344 for 3 credits. P, 342-344 (3 credits).

**352 Inorganic Chemistry 4(3,3) F**

Theoretical and periodic aspects of inorganic chemistry. P, 232.

**380 Environmental Chemistry 4(4,0) S**

Emphasis on the role of chemistry in understanding and solution of environmental problems. P, 112, 114 (4 credits) or 110, 120 (4 credits).

**382 Techniques in Clinical Laboratory Technology 2(1,3) S**

Introduction to techniques used in the clinical laboratory including urinalysis, hematology and clinical chemistry.

**395 Directed Studies**

See general description in College of Arts and Science alternatives and options.

**434 Instrumental Analysis 4(2,6) S 1983**

Theory and practice in instrumental analysis. P, 232, 224, 344, or consent.

**461 Intermediate Biochemistry 3(3,0) S**

Intermediate level study of biochemical processes of plants and animals, emphasizing the integration and control of their metabolic processes. P, 260.

**494 Cooperative Education/Internship/Field Experience (Topical) 1-4 each FSSU**

Planned and supervised professional experience related to chemistry which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

**496 Undergraduate Course Specials**

See general description in College of Arts and Science alternatives and options.

**Graduate Courses\*****522-622 Advanced Organic Chemistry 3(3,0) S**

Review and discussion of nomenclature, stereochemistry, resonance theory, equilibria, elementary kinetics, intermediate and mechanisms. Chemistry of polymers, heterocyclics, and natural products. P, 224, 344 or concurrent registration.

**524-624 Structural Determination of Organic Compounds 3(2,3) F (1987)**

Structural determination primarily by spectroscopy. P, 434.

**528-628 Physical Organic Chemistry 3(3,0) F (1986)**

Physical organic, reaction mechanisms, m.o. calculations, orbital symmetry, and e.s.r. spectroscopy. P, 344.

**532-632 Advanced Analytical Chemistry 3(3,0) F**

Theoretical treatment of principles involved in noninstrumental analytical chemistry including sampling and statistics. P, 344.

**534-634 Analytical Spectroscopy 3(3,0) S (1988)**

In-depth treatment of quantitative applications and theory of modern spectroscopy techniques including atomic absorption, emission, and fluorescence; molecular absorption and fluorescence; and X-ray spectroscopy. P, 434.

**536-636 Chromatography and Separations 3(3,0) S (1987)**

Theory and practice of solvent extraction and paper, thin layer, gas and liquid chromatographic techniques. P, 232.

**542-642 Advanced Physical Chemistry 3(3,0) S**

A review of the principles and applications of physical chemistry. Topics such as thermochemistry, quantum mechanics, spectroscopy, kinetics, and electrochemistry considered. P, 344.

**544-644 Chemical Thermodynamics 3(3,0) F (1986)**

Discussion of the laws and theories of classical and statistical thermodynamics as related to macroscopic chemical systems. P, 344.

**546-646 Atomic and Molecular Structure 3(3,0) F (1987)**

Quantum mechanics and theoretical treatment of chemical structure and binding. P, 224, 344, or concurrent registration in 344.

**552-652 Descriptive Inorganic Chemistry 3(2,3) F (1987)**

Periodic relationships of the elements. Preparation and purification of typical inorganic compounds. P, 120 (4 credits), 352.

**554-654 Advanced Inorganic Chemistry 3(3,0) S**

Inorganic systems including theoretical, representative group and transition metal topics. P, 344 or 352.

**560-660 Radioisotope Techniques 4(3,3) S**

Theory and measurement of radioactivity. Techniques for application of radioactive isotopes in chemical and biological experimentation. P, consent of instructor.

**562-662 Principles of Biochemistry 3-5(3,0 or 3,6) F**

Chemistry of biological processes occurring in plants and animals. P, 260.

**572-672 Seminar 1(1,0) FS**

Required of all graduate chemistry majors.

**581-681 Bioinorganic Chemistry 3(3,0) F (1986)**

A study of biological systems stressing the role of metal ions, primarily the transition metals. Model systems included in the discussion. P, 120 (4 credits), 354 or consent of instructor.

**591-691 Special Problems\* (0,\*) FS****720 Special Topics in Organic Chem 1-6****730 Special Topics in Analytical Chem 1-6****740 Special Topics in Physical Chem 1-6****750 Special Topics in Inorganic Chem 1-6****760 Special Topics in Biochemistry 1-6****764 Biochemistry I 3(3,0) S (1987)****766 Biochemistry II 3(3,0) S (1988)****773 Seminar 1(1,0) FS**

The following Physics courses may be used in either the graduate major or minor program.

**Phys 635 Reactor Physics 3(3,0) S; Phys 637 Science of Solids 3(3,0); Phys 743 Statistical Mechanics 2(2,0); Phys 775 Advanced Quantum Mechanics 3(3,0); Phys 779 Group Theory in Quantum Mechanics 3(3,0).**

\*A more complete description of courses can be found in the Graduate Bulletin.

## Child Development and Family Relations(CDFR)

### College of Home Economics

Professor Richardson, head; Professor Kranzler (Emeritus); Assistant Professors Gilkerson, Russell, Sorenson, Straub; Instructors Branum, Ellis.

#### Marriage and Family Counseling Center

The center in the department deals with premarital, marital, and family adjustment problems. Clients are assisted in gaining insight into problems and in weighing advantages and disadvantages of alternative adjustments. College students will find understanding and help in the solution of their premarital and marital problems.

#### Helen Young Laboratory Nursery School

The department through its laboratory provides opportunities for both study and experiences in areas of human development and family relationships from infancy through parenthood. In the laboratory the student has an opportunity to work with nursery school children and their parents.

#### Cooperative Programs with Black Hills State College and Dakota State College

Child Development majors electing the Early Childhood Education Option can meet state requirements for elementary certification through cooperative programs with Black Hills or Dakota State Colleges. The BHSC program requires two semesters and a summer at BHSC; the DSC program requires three semesters at DSC.

#### Minors in Child Development and Family Relations

18 hours of CDFR. All courses for the minor must be approved by the department head no later than the beginning of the junior year.

#### Majors in Child Development and Family Relations

The department offers three optional areas of emphasis within its curriculum. Majors in Child Development may elect to train for occupations in the following general fields: Child Development — Early Childhood Education, Child and Family Services, and Honors Program.

#### Academic Standards

Academic standards for admission to the professional courses in Child Development (271, 361, 362, 364, 472, 473) are: no grade lower than a C in 211, and a GPA of 2.0 in the following courses: Introduction to Psychology, Introduction to Sociology, Freshman English.

To be eligible for graduation as a major in Child Development and Family Relations you must have a grade of "C" in the following courses: 271, 361, 362, 472, and 473.

In all options within the department which require one or more of these courses, grades lower than "C" require that the course be repeated until a grade of "C" is earned.

#### Honors Program

This is designed for the above average student who is primarily interested in a program designed to lead to the M.S. and/or PH.D. degrees. Courses in addition to the core curriculum will be decided in conference with the academic advisers.

#### Core Curriculum

The core curriculum in Child Development and Family Relations consists of: CDFR 141, 211, 271, 312, 313, 342, 362, 363, 364, 401, 414, 472, 473; Psyc 101; Soc 100; The Home Economics core courses, and the university core.

### Child Development and Family Relations — Early Childhood Education Option

This option is for the students interested in early childhood education, nursery school teaching, day care, Head Start and similar work.

Freshman	Credits
Family Development, CDFR 101 .....	2
Field Experience, HE 101 .....	2
Career Exploration, HED 101 .....	1
Nutrition and the Family, NFS 101 .....	2
Clothing the Family, TC 101 .....	1
Housing and the Family, TCID 102 .....	1
Managing Family Resources HE 102 .....	2
Fitness and Lifetime Activities, PE 100 .....	2
Fund of Speech, SpCm 101 .....	3
Individual and the Family, CDFR 141 .....	2
Fr Comp, Engl 101 .....	3
Gen Psychology, Psyc 101 .....	3
Algebra, Math 111 or Math 101, Survey of Math .....	3
Intro to Sociology, Soc 100 .....	3
	30

Sophomore	Credits
Human Development and Personality I, Childhood, CDFR 211 .....	3
Home Economics Electives (not in your major field) .....	2-4
Experience in Human Relations, CDFR 271 .....	3
Electives .....	15-19
	32-36

Junior Year	Credits
Materials and Techniques in Creative Expression, CDFR 361 .....	4
Planning and Methodology for Preschool Programs, CDFR 362 ..	4
Dynamics of Family Dev, CDFR 342 .....	3
Discussion, SpCm 334 .....	2
Junior Comp, Engl 300 .....	3
Human Dev. Psly II: Adol., CDFR 312 .....	2
Human Dev. Psly III: Mid and later yrs., CDFR 313 .....	2
Parent Education, CDFR 364 .....	2
Electives .....	15-19
	34-36

Senior Year	Credits
Current Theories, CDFR 414 .....	3
Problems in CDFR, CDFR 443 .....	2
Student Teaching in Preschool Programs I and II, CDFR 472/473 .....	8
Human Dev. Poverty Families, CDFR 363 .....	3
Seminar, Sp. Topics or Ind. Study .....	2-3
Suggested Electives: Hlth 159, 260 or 360; Actg 210; CDFR 494; SeEd 405; Danc 131; Chem 100; Phy 101; Zool 123.	
Home Economics .....	3-6
HE 241 Mgt Fam Psl Liv; HE 442 Fam Res Mgt Lab; NFS 221 Survey Hum Nut; NFS Instit Org & Mgt; TC 413 Soc Psych Aspects of Cloth; ID 221 Intro Int Des.	
	32-36

\*To be chosen from at least two areas with different prefixes.

## Cooperative Programs

This option, or area of specialization, has the following requirements in addition to those listed above. Professional education and required courses with grades below "C" will not transfer to Black Hills State or to Dakota State Colleges.

### COOPERATIVE PROGRAM AT BLACK HILLS STATE COLLEGE, 2 semesters and 1 summer

Courses recommended by BHSC.

Amer Hist Survey I or II, Hist 251 or 252.....	3
Movement Exp. with Children, PE 359, or Elem Sch. PE, PE 460.....	2
Hist of Am Indian, Hist 368.....	3
Survey of Math, Math 101.....	3
Pract and Prof Lab, SeEd 287.....	2
Ed Psyc, EPsyc 302.....	2
First Aid, Hlth 260.....	2
Amer Govt, PolS 100.....	3
Chemistry, Chem 100, or 110.....	3
Drawing I, ArtS 113.....	3
Intro Biology, Bio 151 or 153.....	3
Physical Geog, Geo 131.....	4

Current course requirements for the semesters to be spent at BHSC may be obtained from the Department office.

### COOPERATIVE PROGRAM AT DAKOTA STATE COLLEGE,

Courses recommended by DSC.

3 semesters

Hist of Am Indian, Hist 368, or Indians of No. Amer, Anth 421....	3
Intro Amer Ed, EdFn 339.....	2
Prac/Prof Lab, SeEd 287.....	2
Ed Psyc, EPsyc 302.....	2
Design I, ArtS 123.....	3
Amer Govt, PolS 100.....	3
Phys Geog, Geo 131.....	3
Survey of Math, Math 101.....	3
Intro Biology, Bio 151 or 152.....	3
Amer Hist Survey I, II, Hist 251, 252.....	6

Current course requirements for the semesters to be spent at DSC may be obtained from the Departmental office.

## Child Development: Child and Family Services Option

For students interested in working in social work agencies (either public or private) which deal with children, adoptions and other family-related problems; religious services; hospital work with children; community service agencies such as YM/YWCA, Girls/Boys Clubs, Scouting.

Freshman	Credits
Family Development, CDFR 101.....	2
Field Experience, HE 101.....	2
Career Exploration, HED 101.....	1
Nutrition and the Family, NFS 101.....	2
Clothing and the Family, TC 101.....	1
Housing and the Family ID 102.....	1
Fitness and Lifetime Activities, PE 100.....	2
Fund of Speech, SpCm 101.....	3
Individual and the Family, CDFR 141.....	2
Fr Comp, Engl 101.....	3
Gen Psychology, Psyc 101.....	3
Math.....	3
Intro to Sociology, Soc 101.....	3

30

## Sophomore

Home Economics Electives (not in your major field).....	2-4
Human Development and Personality I: Childhood, CDFR 211....	3
Experience in Human Relations, CDFR 271.....	3
Electives.....	23-27
	32-36

## Junior Year

Junior Comp, Engl 300.....	3
Discussion, SpCm 334.....	2
Materials and Techniques of Creative Expression, CDFR 361....	3
Planning and Methodology for Preschool Programs, CDFR 362..	4
Dynamics of Family Development, CDFR 342.....	3
Human Development: Cultural and Economic Influences CDFR 363.....	3
Parent Education, CDFR 364.....	3
Human Development and Personality II: Adolescence, CDFR 312.....	2
Human Dev. and Psly III: Mid and later yrs., CDFR 313.....	2
Electives.....	9-13
	32-36

## Senior Year

Seminar, Sp. Topics or Ind. Study.....	2-3
Current Research and Theories in Child Development, CDFR 414.....	3
Problems in CDFR, CDFR 443.....	3
Student Teaching in Preschool Programs I, II, CDFR 472/473....	8
Practicum in Child Family Service CDFR 494.....	4-12
Electives.....	16-18
Home Economics.....	3-6
HE 241 Mgt Fam Psl Liv; HE 442 Fam Res Mgt lab; NFS 221 Survey Hum Nut; NFS 391 Instit Org & Mgt; TC 413 Soc Psyc Asp Cloth; ID 221 Intro Int Des.....	32-36

The options, or areas of specialization, have the following respective requirements in addition to those listed above.

### Religious Service Concentration

Philosophy and Religion Courses.....	10-12
To be decided upon in conference with CDFR and Religion department advisers.	
HPER-Recreation.....	10-12
The specific courses are to be agreed upon in conference with major adviser.	

### Family and Youth Organization Concentration

HPER Recreation Minor.....	22
----------------------------	----

### Social Services Concentration

Intro to Social Work, Soc 270.....	3
Social Legislation, Soc 370.....	3
17 elective credits with adviser approval from: SpCm 334; Soc 150, 351, 451, 471; Psyc 356, 357, 358, 362, 441, 451.	

### Children's Services in Hospitals Concentration

Anatomy, Zool 123.....	3
Gen Chem, Chem 100.....	4
Health Science or Nursing Courses.....	8-10
Emer. Medical Care, Hlth 159 (or equivalent).....	2

## Undergraduate Courses

### 101 Family Development 2(2,0) FS

The Family Life Cycle Developmental sequences and tasks of individuals and the family. Each stage studied in sequence. Interaction of family with community.

#### 141 Individual and the Family 2(2,0) FS

Human development, behavior and relationships as influenced by family interaction. Emphasis on social and emotional needs of individual and family. Open to men and women. Personal consultation service available.

#### 211 Human Development and Personality I: Childhood 3(3,0) FS

Knowledge and understanding of human being through study of development beginning at conception continuing to adolescence. Consideration given to biological growth, social, emotional and intellectual development as it changes behavior and shapes the individual. Observation in Nursery School Laboratory.

#### 250 The Development of Human Sexuality 3 cr.

A basic course which explores the biological, behavioral, and cultural aspects of human sexuality. The course will focus on individual sexual development, inter-personal aspects of sexual behavior and social and cultural values and beliefs about sexuality and sex roles throughout the life span.

#### 271 Experience in Human Relations By Reservation Only 3(1,6) FSSu

Opportunity to more fully understand children as well as oneself and other adults while observing and working with children in Nursery School Laboratory. P, 211 with grade of "C".

#### 312 Human Development and Personality II: Adolescence 2(2,0) F

Knowledge and understanding of adolescence within the developmental framework. Dimensions of physical growth, biological changes, social, intellectual and emotional development will be considered, as well as the impact of interaction of these forces on the individual. Emphasis is upon normal developmental patterns.

#### 313 Human Development and Personality III: The Middle and Later Years 2(2,0) S

Developmental approach to middle age and aging. Emphasis on the physical, biological, intellectual and emotional changes. Impact of change upon the personality, self-concept of the individual and their effects upon social behavior, productivity and personal relationships.

#### 342 Dynamics of Family Development 3(3,0) FS

Principles of interaction in marriage and family life. Family systems, processes of communication styles, interaction patterns as they influence problem solving, decision making, and other issues relating to the marriage process and family functioning.

#### 361 Materials and Techniques in Creative Expression 4(4,0) FS

Creativity in language, graphic arts, music, dance, physical and natural science aimed at appreciation, understanding and evaluation of creative production of children in relation to their developmental stages. P, 211, 271, concurrent with CD 362.

#### 362 Planning and Methodology for Preschool Programs 4(4,0) FS

Planning curriculum to meet the needs of young children and their families. Setting up developmental goals and objectives and designing experiences to accomplish them. Consideration of problems in the education of young children and of the implications of various theoretical orientations. P, 211, 271.

#### 363 Human Development: Cultural and Economic Influences 3(3,0) F

Human development as influenced by the dynamics of family interaction under the pressures of poverty and slum living. Families of both rural and urban groups are included.

#### 364 Parent Education 3(3,0) FS

Principles of parent education for professional role that will include work with parents. Opportunity for formulation and presentation of program for parents. P, 211, 342.

#### 401 Seminar 1-3 credits FS

Discussion of current literature in areas of human development, early childhood education, marriage, and family relationships.

#### 414 Current Research and Theory in Child Development 3(3,0) FS

Study of topics in human development research and theories. Strong emphasis on learning to read research studies intelligently. Paper on current research topic is required. P, Sr. standing, or instructor's consent.

#### 443 Problems in Family Relations and Child Development 3(3,0) FS

Problem areas in modern family living. Integrating and disorganizing factors affecting marital relationships, parent-child relationships and adequate functioning of family as a whole. Consideration of current findings on such topics as working mothers, young marriages, divorce and remarriage, exceptional children in the home. (Includes field experiences.) Open to men and women from all colleges.

#### 465 Introduction to Developmental Assessment of Young Children 2(2,0) S

Experiences to increase awareness of and knowledge about a variety of assessment procedures appropriate for use with children from birth through eight years of age. Advantages and limitations of assessment techniques noted; considerations used in the interpretation of findings and in making referrals discussed. Includes opportunities to work with assessing preschool age children and in developing prescriptive activity plans. P, CDFR 271 or equivalent.

#### 472 Student Teaching in Preschool Programs I By Reservation Only 4(1,10) FSSu

Planning and conducting various phases of early childhood programs. Student takes increasing responsibility, finally taking complete charge of the program. Weekly conferences. P, grade of "C" in 211, 271, 362.

#### 473 Student Teaching in Preschool Programs II By Reservation Only 4(1,10) FSSu

Should be taken concurrently with CDFR 472, or in consecutive semester. P, 472.

#### 492 Special Problems 1-4 credits

Individual study for qualified students. P, consent.

#### 497 Practicum in Child and Family Services 4-12 credits

Field experience with agencies delivering social services to children and families. Apply to department head.

## Graduate Courses

#### 502-602 Seminar 1-3(1-3,0) (On sufficient demand)

Reports and discussions of current literature, including research methodology in human development, personality, family relations, marriage and family counseling. Maximum of 4 credits may be applied on advanced degree. P, consent.

#### 543/643 Current Topics 1-3 (On sufficient demand)

Study of contemporary issues and concerns in the field of Child Development and Family Relations. Focus on topics not included in other graduate courses in the department. P, consent. Can be repeated.

#### 544-644 American Woman Roles and Relationships 2(2,0) S (On sufficient demand)

Recent literature regarding changing role of woman, her developmental tasks and unique contribution she has to make in dynamic 20th century America.

#### 576-676 Early Childhood Education, Administration and Practicum 2-4 (On sufficient demand)

#### 577-677 Child and Family Counseling 3(3,0) F

Theory and philosophy of counseling with children and their families. P, consent.

#### 582-682 Special Problems in Human Development and Family Relations 2-4 credits as arranged

Individual study for qualified students. P, consent.

#### 711 Child Development Theory and Application 3 cr.

\*Emphasis upon understanding underlying theories and their application in understanding developmental and growth processes; relationship between cognitive, social, physical and emotional development and behavior patterns; range of normality in growth and development. Focus on normal development but consideration of impact of deviance from norms on child and family.

#### 742 Family Relations

Study of current theories of family interaction. Impact of various forces (social, personal, intra-personal) on the dynamic aspects of family relationships. Emphasis upon family systems, patterns and sequences of coalitions and alliances, factors which result in strength and solidarity or stress and breakdown. Emphasis upon normal families.

## Civil Engineering (CE)

Professor Rollag, Head; Professors Dornbush, Hassoun, Koepsell, Prasuhn, Selim, Sigl; (Emeritus) Johnson, Larson; Associate Professors Johnson (adjunct), Shafi, Tiltrum; Assistant Professor Forest; Instructor DeBoer; Lecturer Housiaux.

Civil Engineering includes the location, design, construction, operation and maintenance of railroads, highways, airports, buildings, bridges, dams, water supply and distribution systems, waste water collection systems and treatment plants, irrigation and drainage systems, river and harbor improvements and many other facilities essential in modern life.

The course is planned to give you a foundation in the exact sciences — mathematics, physics, and chemistry; a thorough training in the technical phases of Civil Engineering — surveying, hydraulics, materials and the design principles; training in the principles of communication — graphic, spoken and written; and an introduction to the social-humanistic area to prepare the graduates for positions of broad responsibility.

Certain electives are provided to give you a chance to broaden your education in the social humanistic area and to provide some technical specialization. The 14 credits of non-technical, and 8 credits of technical electives must be approved by the department head. Humanistic and social science electives must be chosen to satisfy the University Core and the more rigorous EAC/ABET requirements.

In addition, to gain some "in-depth" exposure in the socio-humanistic area, students are encouraged to take at least two courses in the same subject area. The Civil Engineering Department office will provide you with an approved list of courses.

To earn the B.S. degree in Civil Engineering you must have an average grade of C or better in courses taken in engineering mechanics (EM) and civil engineering (CE).

The department will assist those interested to arrange cooperative work-study programs, after the freshman year, with consulting and testing firms, governmental agencies and industry. Credit may be obtained for the work experiences by prior arrangement, by registering for CE 494 Cooperative Education/Internship/Field Experience. These credits will not apply toward the B.S. degree in civil engineering, but will be part of your academic record.

### Curriculum in Civil Engineering

(Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology)

Freshman Year		F	S
Mathematical Analysis I-II, Math 123-224.....	5	4	
Gen Chem, Chem 110 or 112 .....	4		
Fr Comp Engl 101 and Fund of Speech, SpCm 101.....	3	3	
Fitness and Lifetime Activities, PE 100.....	1	1	
Orientation for Engineers, GE 110.....	0		
Engineering Design Graphics, I-II EG 121-122	2	2	
Gen Chem or Elementary Organic Chem, Chem 114 or 120.....		3	
Elementary Surveying, CE 106 .....		3	
	15	16	
Sophomore Year		F	S
Math Analysis III, Math 225.....	3		
Differential Equations, Math 321.....		3	
Statics, EM 221 .....	3		
Engineering Surveys, CE 208.....	3		
Prin of Economics I, Econ 201 .....	3		
Materials, CE 216.....		3	
Dynamics, EM 222 .....		3	
Intro to Literature, Eng 218.....		3	
Gen Physics, Phys 211, 213.....	4	4	
Introduction to Programming with FORTRAN, CSc 321.....	3		
	19	16	
Junior Year		F	S
Fluid Mechanics, EM 331.....	3		
Mech. of Materials, EM 321 .....	3		
Structural Materials Lab, CE 311.....	1		
Junior Comp, Engl 300 or Adv. Exposition, Engl 303 .....	3		
Transportation Engineering, CE363.....	3		
Seminar, CE 393.....	0		
Structural Theory, CE 353 .....		3	
Geology, PS 243 .....		3	
Thermodynamics, ME 314.....		3	
Basic Electrical Engineering I, EE 305.....		3	
Water Supply Engineering, CE 327.....	4		
Elective.....	5	2	
	18	18	

Senior Year	F	S
Steel Design, CE 455.....	3	
Wastewater Engineering, CE 423.....	3	
Soils Engineering, CE 446.....	4	
Hydraulic Engineering, CE 433.....	3	
Fluid Mechanics Lab, CE 331 .....	1	
Concrete Theory and Design, CE 456 .....		3
Engineering Administration, CE 475.....		3
Electives .....	4	12
	18	18

<b>Total hours required for graduation.....</b>	<b>136</b>
<b>Electives.....</b>	<b>23</b>

### Technical Electives

	Credits
Computer App. to CE, CE 412.....	3
Sanitary Engineering, CE 427.....	3
Bituminous Materials, CE 511 .....	2
Environmental Engineering, CE 523.....	3
Industrial Waste Treatment, CE 524 .....	2
Environmental Engineering Planning, CE 525.....	3
Water Quality Analysis, CE 526 .....	3
Water Treatment Plant Design, CE 527 .....	3
Wastewater Treatment Plant Design, CE 528.....	3
Hydrology, CE 333.....	2
Open Channel Hydraulics, CE 533 .....	3
Fluvial Hydraulics, CE 534.....	3
Water Resources Engineering, CE 535 .....	3
Hydraulic Design, CE 537 .....	3
Advanced Hydraulics, CE 538 .....	3
Foundations, CE 536.....	3
Advanced Soils Engineering, CE 546 .....	3
Design of Timber Structures, CE 458 .....	2
Precast Concrete Structures, CE 459 .....	3
Indeterminate Structural Analysis, CE 457 .....	3
Plastic Design, CE 551.....	3
Prestressed Concrete, CE 552 .....	3
Adv. Design Steel Struct, CE 554 .....	3
Adv. Reinforced Conc. Design, CE 556.....	3
Matrix Anal. of Struct, CE 557 .....	3
Design Steel and Concrete Bridges, CE 564 .....	3
Indeterminate Structural Analysis, CE 457 .....	3
Advanced Structural Mechanics, CE 559.....	3
Highway Engineering, CE 467 .....	3
Pavement Design, CE 563 .....	3
Construction Engineering, CE 473 .....	3
Construction Methods and Equipment, CE 474.....	3
Photogrammetry, CE 306.....	3
Land Surveying, CE 304 .....	3

### Undergraduate Courses

#### 106 Elementary Surveying 3(1,6) FS

Use, adjustment, and care of surveying instruments; analysis of errors in observation. P, Math 120 or 113 and EG 121.

#### 201 Topographic and Route Surveying 2(0,6) S

(For non-civil engineering students.) Field and office work involved in topographic mapping, fundamentals of aerial photographs; elementary curve theory. P, 106.

#### 208 Engineering Surveys 3(1,6) FSu

Topographic surveys and mapping elements of photogrammetry, land and construction surveys, principles of curve and earth work calculations and other advanced topics in surveying. P, 106.

#### 211 Materials of Construction 2(0,6) F

(For non-civil engineering students.) Sources, applications, and properties of materials used in construction. Laboratory tests to determine these properties. P, sophomore standing.

#### 216 Materials 3(2,3) FS

Basic structure of materials and its effect on material properties. Laboratory tests on materials, principles of concrete mixes. P, Phys 211, Chem 110 or 112 and 120.

**304 Land Surveying 3(3,0) F**

Public land surveys, land subdivisions, land boundaries, land descriptions, state plane coordinates, legal aspects of land ownership, precise surveying methods such as triangulation, base line measurements. P, CE 208.

**306 Photo Interpretation and Photogrammetry 3(1,6) S**

Engineering evaluation of aerial photographs, including topography, analysis of soils and surface drainage characteristics. Use of aerial photographs for location and design of highways, airports and other construction projects. P, 208, or consent.

**311 Structural Materials Lab 1(0,3) FS**

Laboratory tests on structural materials and elements, and interpretation of test results. Careful laboratory techniques are emphasized. P, 216 with EM 321.

**327 Water Supply Engineering 4(3,3) FS**

Hydrologic cycle, surface water and ground water, water consumption and demand, quality of water, pumping, treatment and distribution of water supplies. P, Chem 110 or 112, EM 331 or consent.

**331 Fluid Mechanics Lab 1(0,3) FS**

Measurement of properties of common fluids, and tests on fluids in motion. Concurrent with 433.

**333 Hydrology 2(2,0) F**

Principles of precipitation, runoff, stream flow and ground water. P, EM 331 or concurrently.

**353 Structural Theory 3(3,0) FS**

Reactions, internal forces, use of influence lines for beams, frames, and trusses for moving loads. P, EM 321.

**363 Transportation Engineering 3(3,0) F**

Engineering principles in various common means of transportation. P, 208, and CSc 312.

**393 Seminar 0(1,0) FS**

Current literature on professional and technical aspects of Civil Engineering. P, junior standing.

**412 Computer Applications to Civil Engineering 3(2,3)**

A comprehensive use of the computer as a tool in design and analysis of alternative solutions in the field of civil engineering. P, CSc 312 and Senior standing.

**423 Waste Water Engineering 3(3,0) FS**

Systems for collecting waste water, waste water disposal and treatment processes, solid waste disposal. P, 327.

**427 Sanitary Engineering 3(1,6) S**

Analysis of water and waste water, design problems in water and waste water facilities. P, 423.

**433 Hydraulic Engineering 3(3,0) F**

Development of fundamental principles related to closed conduit flow, flow in open channels, open channel transitions and controls, introduction to wave mechanics, hydraulic structures. P, EM 331.

**446 Soils Engineering 4(3,3) F**

Soil principles, index properties, moisture density relations, compressibility, stresses, embankments, foundations, soil compaction and stabilization, laboratory tests on fundamental soil properties. P, 216, PS 243, Senior Standing.

**455 Steel Design 3(1,6) FS**

Design and detailing principles for structural connections, tensions members, compression members, beams and girders. P, 353.

**456 Concrete Theory and Design 3(2,3) FS**

Principles for reinforced concrete structures based on strength design methods; serviceability of flexural members; ACI code requirements. P, 353.

**457 Indeterminate Structural Analysis 3(2,3) S**

Analysis of deflections and indeterminate structures, double integration, moment areas, conjugate beam, energy methods, graphical integration, numerical methods, slope deflection, moment distribution, and matrix methods. P, 353.

**458 Design of Timber Structures 2(2,0) Alternate years**

Physical and mechanical properties of wood. Design of columns, beams, trusses, curved members, connections and common structural systems. Loadings and deflection of structural members. Design using dimension lumber, plywood, and laminated members will be discussed. P, 353.

**459 Precast Concrete Structures 3(3,0) Alternate years**

Advantages of precast concrete. Structural and architectural precast elements. Building systems. Design concepts and structural design. Connections, specifications, and detailing. P, 456.

**467 Highway Engineering 3(2,3) S**

Highway administration and finance, traffic characteristics, highway standards, drainage, geometric design, construction methods. P, 363.

**473 Construction Engineering 3(2,3) S**

Construction management, equipment, operations, and costs. P, Senior standing or consent.

**474 Construction Methods and Equipment 3(2,3) F**

Detailed study of the various methods, equipment and techniques of construction. Interaction between contractor, design engineer, inspector and owner will be emphasized. P, senior standing or consent.

**475 Engineering Administration 3(3,0) S**

Law of contracts, agency, and other legal aspects of engineering. Preparation of specifications. Economic aspects of engineering. P, senior standing.

**492 Special Problems 1-3 FSSu**

Individual investigation. P, consent. **494-495-496 Cooperative Education/Internship/Field Experience 1-6 FSSu**

Planned and supervised professional experience related to civil engineering which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

**496 Inspection Trip 0 F**

Inspection trip to industrial plants, construction projects, and other engineering sites.

**Graduate Courses****511-611 Bituminous Materials 2(2,2)**

Properties of bituminous materials including their compatibility with various types of aggregates. Asphalt cement surface courses are designed and tested for stability. Standards tests are performed on bituminous materials with emphasis on test results. P, 216.

**523-623 Environmental Engineering 3(3,0) F**

Relationship of man's environment to health and control of this environment from an engineering standpoint. P, Consent.

**524-624 Industrial Waste Treatment 2(2,0) S**

Characteristics and compositions of industrial wastes, sampling and methods of analysis of these wastes and remedial measures for treatment and disposal. P, 423 or consent.

**525-625 Environmental Engineering Planning 3(3,0) 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 area and state or region. P, graduate standing or consent.

**526-626 Water Quality Analysis 3(1,6) F**

Chemistry and interpretation of process control tests for the use and treatment of water and waste water. Application of test results to the design of water and waste water treatment works. P, 327 or consent.

**527-627 Water Treatment Plant Design 3(1-6) F**

Water supply sources, design of treatment plants, cost estimates of water supply systems. P, graduate standing.

**528-628 Waste Water Treatment Plant Design 3(1,6) S**

Design of waste water collection and disposal facilities, waste treatment plants, cost estimates of waste disposal and treatment systems. P, graduate standing.

**533-633 Open Channel Hydraulics 3(3,0) F**

Energy and momentum principles in open channel flow, flow resistance, flow in uniform and non-uniform channels, flood routing. P, 433.

**534-634 Fluvial Hydraulics 3(3,0) S**

Erosion, transportation, and deposition of sediments by flowing water, bed load and suspended load movement, river behavior and control. P, 433.

**535-635 Water Resources Engineering 3(3,0) S**

Topics related to water resources engineering including: multiple purpose river development, economic analysis of flood control measures, aspects of water law, advanced topics related to surface and ground water hydrology and administrative aspects of water resources planning. P, 433.

**536-636 Foundation Engineering 3(3,0)**

Bearing capacity, load induced pressures and settlements, soil exploration and sampling, lateral-earth pressure, retaining walls, sheet pile structures, pile formations and caissons. P, 446.

**537-637 Hydraulic Design 3(3,0) F**

Hydraulic design as applied to hydroelectric power development and turbine design, flood routing in reservoirs and natural channels, design of drainage structures and energy dissipator. P, 433.

**538-638 Advanced Hydraulics 3(2,3) S**

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, 433.

**546-646 Advanced Soils Engineering 3(2,3) S**

Application to engineering problems. Stability, compaction, embankments, seepage, drainage, stabilization. P, 446.

**551-651 Plastic Design 2(0,6) F**

Modes of failure, plastic hinges, design rules and applications. P, 455.

**552-652 Prestressed Concrete 3(3,0)**

Theory and design of prestressed concrete including pre-tensioning and post-tensioning. P, 456.

**554-654 Advanced Design of Steel Structures 3(3,0) Alternate years**

Design of slender compression elements, tapered members, plate girders, composite girders, column base plates subjected to bending moments, connections. Cold formed steel structures. P, 455.

**556-656 Advanced Reinforced Concrete Design 3(3,0) Alternate Years.**

Design of rigid frames, effect of plastic behavior, details for complex structures, analysis of flat plate and other two-way floor systems. Design comparisons. P, 456.

**557-657 Matrix Analysis of Structures 3(3,0)**

Theory and application of matrix methods in structural analysis. P, 353.

**559-659 Advanced Structural Mechanics 3(2,3) S**

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, misc. topics in structural analysis. P, EM 321, CE 353.

**563-663 Pavement Design 3(3,0) S**

Stresses in and design of flexible and rigid pavements including sub-grades, bases and sub-bases. P, 363.

**569-669 Design of Steel and Concrete Bridges 3(3,0) Alternate years**

Determination of bridge loadings and bearings. Design of concrete and steel bridge systems. Specifications and detailing related to bridge design. P, 455, 456.

**590-690 Special Engineering Problems 1-3 FS**

P, Graduate standing or consent.

**595-695 Special Topics 1-3 FSSu**

P, Graduate standing or consent.

**723 Advanced Sanitary Engineering 3(3,0)****733 Water Resources Engineering 3(3,0) S****763 Highway Administration and Economy 3(3,0)****764 Advanced Transportation Engineering 3(2,3)****790 Thesis 5-7 FSSu**

# Computer Science (CSc)

## College of Engineering

Professor Bergum, Acting Head; Professor Bennett, Associate Professors Clever, Lundberg, Vandever; Assistant Professors Broshat, Greve, Hovland, Johnson and Instructor Kenner

The Department of Computer Science at South Dakota State University is structured to serve the students in three ways:

(1) to provide educational opportunities so all students on campus can receive educational literacy in computers. Courses are offered which teach the fundamental system concepts of computers and introduce the students to the techniques of interacting with a computer system. There is also material offered which gives the students a better understanding of computers in our society.

(2) for those students who need more support in their areas, a Computer Science minor is offered. The minor is structured to require a fundamental knowledge of programming and statistical analysis and has elective courses which permit the students to match their Computer Science education with their major area. A minor in Computer Science consists of CSc 114 (or CSc 312), MATH 381 (or STAT 341) plus a minimum of 12 credits from 200 series or above (except 311). Related courses can be substituted. An average grade of "C" in the minor coursework is required.

(3) the department also offers a major in Computer Science, the Bachelor of Science degree in Computer Science.

Students interested in the Computer Science degree will be accepted into the Department of Computer Science in the College of Engineering as pre-computer science majors. Only those students who have a 2.75 GPA following 30 credits of acceptable coursework will be considered for acceptance into the degree program.

Formal application is required for acceptance into the major. Deadline for acceptance is mid-term of the semester preceding entrance. Failure to meet the application deadline may disqualify you from enrollment in the Computer Science degree courses.

Fulfillment of the GPA requirement does not assure admission. Applicants are selected competitively. Total enrollment in the major may vary but will be no more than 35 per class. Enrollment will depend on availability of faculty and funding with the selection made from among those students best qualified for career in computer science.

128 Semester Credits

Freshman Year	F	S
Mathematical Analysis I, II; Math 123, 224....	5	4
English & Speech, Engl 101, SpCm 101.....	3	3
Fitness & Lifetime Activities, PE 100.....	1	1
PASCAL Programming, CSc 114.....	3	
Intro. to Data Processing, CSC 271.....		4
Natural Science Electives.....	4	4
Electives.....	1	
	<hr/> 17	<hr/> 16

**Sophomore Year**

	F	S
Matrix Algebra, Math 215.....	2	
Discrete Structures, Math 243.....		3
Logic and Set Theory, Math 353.....	2	
Data Structures, CSc 285.....		3
COBOL Programming, CSc 313.....	3	
Computer Logic, CSc 241.....	3	
Computer Languages (PL/1) CSc 316.....		3
Social Science Electives.....	3	3
Humanities Electives.....	3	4
	<hr/> 16	<hr/> 16

**Junior Year**

Statistical Methods, Stat 341*.....	3	
Computer Operations, CSc 314.....	3	
Junior Composition, Engl 300**.....		3
Computers & Society, CSc 203.....	2	
Systems Programming, CSc 354.....		3
Computer Information Systems, CSc 361.....		3
Intro to Numerical Computation, Math 373.....	3	3
Social Science Electives.....		4
Applied Electives****.....	4	
Elective.....	1	
	<hr/> 16	<hr/> 16

**Senior Year**

Computer Architecture, CSc 426.....		3
Compiler Construction, CSc 428.....		3
Operating Systems, CSc 456.....	3	
Math Elective***.....	3	
Applied Electives****.....	4	4
Electives.....	6	6
	<hr/> 16	<hr/> 16

\*May substitute Math 381

\*\*May substitute Engl 303

\*\*\*From Math 225, 315, 321, 331, 313, 571, 583, or Stat 541

\*\*\*\*Courses chosen from field of study

**Undergraduate Courses****112 Microcomputer BASIC and Literacy 2(2,0) FS**

Computer literacy is stressed. Terminals are used to enter and run a number of simple BASIC programs. P, high school algebra.

**114 PASCAL Programming 3(3,0) FS**

An introduction to concepts of structured programming in the computer language PASCAL. Algorithm analysis and top-down design of larger programs, P, 2 years high school algebra or consent.

**203 Computers and Society 2(2,0) FS**

Impact on the social and cultural environment and daily life. History, use, terminology and computer equipment.



**241 Computer Logic 3(3,0) FS**

Instruction to binary logic. Boolean algebra, instruction sequencing, addressing systems in an elementary manner appropriate for a student at the sophomore level. Prerequisite-Math 113.

**271 Computer Programming, Data Processing 4(3,2) FS**

Gives non-engineers an appreciation of the use of computers. FORTRAN programming, flow charting, data processing techniques, evaluation of computer hardware, binary arithmetic, elementary numerical analysis and optimization applications. P, Math 111 (with C or better) or equivalent.

**285 Data Structures 3(3,0) F**

The study of list, string, array and graph structures within a computer system. An introduction to the various types of data base design philosophy and the advantages and disadvantages. Prerequisite: CSc 312 or 271.

**311 Introduction to Computers and Programming 3(3,0) S**

History, operating principles and applications, as well as BASIC programming. P, CSc 112.

**213 Introduction to Programming with FORTRAN 3(3,0) FS**

FORTRAN programming for engineers. P, Concurrent enrollment in Math 224.

**313 COBOL Programming 3(3,0) FS**

An introduction to COBOL programming. The topics of structured programming style, data structures, file processing concepts and techniques both sequential and random organization, and documentation are presented. Programming problems are from typical business applications. P, FORTRAN or PASCAL.

**314 Computer Operation 3(3,0) S**

ASSEMBLY language programming, organization and operating principles of the IBM computer, and others. For students seriously interested in computers or computer programming. P, CSc 271, 311, or 312.

**316 PL/I Programming 3(3,0) FS**

Introduction to PL/I programming. Includes scientific and business oriented programming applications, data structures, structured programming and file processing. P, FORTRAN or PASCAL.

**354 Introduction to Systems Programming 3(3,0) S**

Advanced assembly language programming and an introduction to operating system services and systems control data areas. P, CSc 314.

**361 Computer Information Systems 3(3,0)**

Introduction to application software development and design methods. Data base and management information systems are also presented. P, CSc 313 or CSc 316.

**425 Microcomputer Applications 3(2,3)**

Advanced programming techniques utilizing microcomputers including file manipulations, graphics, micro-mainframe data transfer. Hardware topics include: communications, microprocessor designs. P, 316.

**426 Computer Architecture and Organization 3(3,0) S**

Elementary computer architecture, gates and digital logic, register transfer, microprocessors and micro operations, computer arithmetic and processor studies of existing systems.

**456 Operating Systems 3(3,0) F**

Operating systems structure; memory, process and I/O management; concurrent processes and case studies of existing operating systems. P, CSc 314 and Stat 341 or 381.

**493 Special Topics in Computer Science 1-3 credits**

Individualized problems determined by mutual agreement between instructor and student. Programming language optional. P, consent of department head.

**494-495-496 Cooperative Education/Internship/Field Experience 1-6**

Planned and supervised professional experience related to computer science which takes place outside the formal classroom with private business or industry or public agencies. P, consent of department program coordinator.

**525-625 Digital Systems Hardware Design 3(3,0)**

## Dairy Science (DS)

### College of Agriculture and Biological Sciences

Professor Parsons, head; Professors Voelker, Schingoethe, Seas, Baker (Emeritus), Spurgeon (Emeritus); Associate Professor Owens, Bartle (Emeritus); Assistant Professors Baer, Sommerfeldt, Torrey

Dairy Science students may choose a major in Dairy Manufacturing or Dairy Production. Under the curriculum in agriculture,

each of the majors offers a general technical program, with several electives. In addition, an option in Science, Business or Ag Education is available with either of the majors. The Dairy Manufacturing major offers a program under the curriculum in Biological Sciences which involves more courses in chemistry and biological sciences and fewer courses in agriculture. Faculty welcome the opportunity to discuss these options and job opportunities with students.

A well-equipped dairy processing plant and sales room make it possible for you to obtain practical experience while learning the principles of dairy processing. Several students work part-time in the processing plant and earn part of their university expenses. The dairy research and production unit houses a herd of 200 Holstein cattle and is a research center in feeding, breeding, and managing a dairy herd. Equally important, it is the site for basic student training in dairy cattle evaluation and other aspects of dairy farming. The milk produced is processed as milk, ice cream, butter or cheese and used in campus eating facilities. Like the processing plant, the research and production unit offers opportunities for students to work part-time and gain practical experience while earning part of their expenses.

**Curriculum in Biological Science,****Dairy Manufacturing Major**

Leading to the Bachelor of Science Degree

**Freshman Year**

	F	S
Fr Comp, Engl 101 .....	3 or	3
Fitness & Lifetime Activities, PE 100 .....	1	1
Gen Chem, Chem 112, 114 .....	4	4
Intro Biology, Bio 151, 153 .....	3	3
Intro Dairy Science, DS 130 .....	3 or	3
Intro to Sociology, Soc 100 .....		3
Fund of Speech, SpCm 101 .....	3 or	3
Humanities Elective .....	2	
Elective .....		2

**Sophomore Year**

	F	S
Algebra, Math 111 .....	3	
Trigonometry, Math 120 .....		3
Gen Microbiology, Micr 231 .....		4
Elementary Physics, Phys 111, 113 or General Physics, Phys 211-213 .....	4	4
Organic Chem, Chem 120, 222 or 326 .....	4-5	
Elementary Biochemistry, Chem 260 .....		4
Dairy Products Judging, DS 202 .....		1
Social Science Elective .....	3	
Humanities Elective .....	2	

**Junior & Senior Years**

	F	S
Junior Comp, Engl 300 .....	3	
Communications elective f .....		2
Food Microbiology, Micr 311 .....	4	
Processing Equipment for Ag Products, MA 443 .....	3	
Macroeconomic Prin, Econ 201 .....	3	
Prin of Accounting I, Actg 210 .....		3
Labor, Law & Econ, Econ 382 .....	3	
Genetics, Bio 371 .....	3	
Dairy Microbiology, DS 301 .....		3
Dairy Product Processing I-II, DS 321, 322 .....	5	5
Technical Control of Dairy Products I, II, DS 221, 422 .....	3	4
Dairy Plant Management, DS 421 .....	3	
Dairy Seminar, DS 400 .....	1	
Computer Programming, CSc 112, 114 or 271 .....		2-4
Humanities Elective .....		2
Electives .....	3	10

**Curriculum in Agriculture, Dairy Manufacturing Major**

Leading to the Bachelor of Science degree

<b>Freshman Year</b>	F	
Fr Comp, Engl 101.....	3	or
Fitness & Lifetime Activities, PE 100.....	1	
Gen Chem, Chem 110, or 112.....	4	
Algebra, Math 111 or Algebra & Trigonometry, Math 113.....		3-5
Intro Dairy Science, DS 130.....	3	or
Intro to Sociology, Soc 100.....	3	
Group I electives.....	3	
Fund of Speech, SpCm 101.....	3	or
Electives.....	2	

<b>Sophomore Year</b>	F	
Macroeconomic Prin, Econ 201.....	3	
Social Science Elective.....	3	
Intro Biology, Bio 151, 153.....	3	
Elementary Organic Chem, Chem 120.....	4	
General Microbiology, Micr 231.....		4
Dairy Products Judging, DS 202.....		2
Humanities electives.....	3	
Electives.....		8

<b>Junior and Senior Years</b>	F	
Junior Comp. Engl 300.....	3	
Communications Elective†.....		2
Food Microbiology, Micr 311.....	4	
Processing Equipment for Ag Products, MA 443.....	3	
Intro Physics, Phys 101 or Elementary Physics I, Phys 111 or Gen Physics I, Phys 211.....	4-5	
Prin of Accounting I, Actg 210.....		3
Technical Control of Dairy Products I-II, DS 221, 422.....	3	
Dairy Microbiology, DS 301.....		3
Labor, Law & Econ, Econ 382.....	3	
Dairy Product Processing I-II, DS 321, 322.....	5	
Dairy Plant Management, DS 421.....	3	
Dairy Seminar, DS 400.....	1	
Computer Programming, CSc 112, 114, or 271.....		2-4
Humanities electives.....	3	
Electives.....	2-8	12

**Curriculum in Agriculture,  
Dairy Production Major**  
Leading to the Bachelor of Science degree

<b>Freshman Year</b>	F	
Fr Comp, Engl 101.....	3	or
Fitness & Lifetime Activities, PE 100.....	1	
Gen Chem, Chem 110 or 112.....	4	
Algebra, Math 111 or Algebra & Trigonometry, Math 113.....		3-5
Intro to Sociology, Soc 100.....		3
Introduction to Dairy Science, DS 130.....	3	or
Crop Production, PS 103.....	3	
Fund of Speech, SpCm 101.....	3	or
Dairy Cattle Evaluation, DS 212.....		2
Electives.....	2	3

<b>Sophomore Year</b>	F	
Macroeconomic Prin, Econ 201.....	3	
Elementary Organic Chem, Chem 120.....	4	
Soils, PS 113.....	3	
Dairy Products Judging, DS 202.....		1
Intro Physics, Phys 101 or Elementary Physics I, Phys 111 or Gen Physics, Phys 211.....	4	
Intro Biology, Bio 151, 153.....	3	
Social Science Elective.....		3
Electives.....		9

<b>S Junior &amp; Senior Years</b>	F		S
Animal Nutrition, AS 223.....	3		
Junior Comp, Engl 300.....	3		
Communications Elective†.....	2		
Gen Microbiology, Micr 231.....	4		
Dairy Microbiology, DS 301.....			3
Dairy Breeds, DS 411.....			2
Farm & Ranch Management, AgEc 271.....			4
Feed Tech, AS 333.....	3		
Computer Programming, CSc 112, 114 or 271.....	2-4		
Genetics, Bio 371.....	3		
Anatomy & Physiology of Livestock, Vet 223.....			4
Prin of Animal Breeding, AS 332.....			4
Dairy Seminar, DS 400.....	1		
Dairy Farm Management, DS 412.....	3		
Dairy Cattle Feeding, DS 432.....			3
Livestock Reproduction, AS 433.....	3		
Humanities Electives.....	3		3
Electives.....			10

†Communication elective to be selected from: Engl 303, 307; MCom 210, 313, 315, 330, 331, 335; SpCm 315, 334, 335.

The following options, for the curricula in Agriculture, have requirements in addition to those listed above.

**Business Option**

Prin of Econ II, Econ 202 (3); Prin of Accounting I, Actg 210 (3); Business Management B-Ad 360 (3); Plus 12 hours to be chosen from; Prin of Accounting II, Actg 211 (3); Personal Finance, B-Ad 380 (3); Marketing, Econ 353 (3); Money & Banking, Econ 330 (3); Statistics I, Stat 341 or equivalent (3); Business Finance, B-Ad 310 (3); Marketing Management, Econ 452 (3); Agricultural Marketing, Ag Ec 354.

**Science Option**

Chemistry, Mathematics and/or Physics (11); Biological Science to be selected from the following areas: Botany, Entomology-Zoology or Plant Pathology (2)

**Dairy Science Majors Interested in Teaching**

Dairy Science majors who desire to prepare to teach vocational agriculture need to plan on completing a double major in Dairy Science and Agricultural Education. The Production Option meets the Dairy Science part of requirement. Contact an adviser in Agricultural Education no later than the Sophomore year for details about qualification for Teacher Certification.

The Dairy Science degree has a minimum requirement of 128 semester credits. The double major would necessitate completing 142 to 146 semester credits. This could be accomplished in an extra semester or by attending two summer sessions.

**Undergraduate Courses**

- 130 Introduction to Dairy Science 3(2,2) FS**  
Essentials of successful dairy farm operation, production testing, feeding, and management of dairy herd. Composition of milk; testing of milk for milk fat, milk solids and quality, and an examination of nutritive value of dairy products.
- 202 Dairy Products Judging 1(0,3) S**  
Quality of milk, butter, cheese, ice cream, and cottage cheese.
- 212 Dairy Cattle Evaluation 2(0,4) S**  
Fundamental aspects of evaluation of dairy cattle for type; type classification of dairy cattle.  
221 Technical Control of Dairy Products I 3(1,4) F  
Fundamental properties of milk and its products as they affect testing. Common physical and chemical intake and laboratory tests for procurement and grading milk. Compositional tests for control of dairy products during processing. P, 130.
- 231 Dairy Foods 3(3,0) F**  
Survey of the dairy processing industry. Principles of processing and manufacturing dairy foods including quality standards and nutritive quality. For non-dairy manufacturing majors only.

**301 Dairy Microbiology 3(2,3) S (1987)**

Quality control problems during the production and processing of fluid milk for human use, including role of regulatory agencies and quality standards. P, Micro 231.

**311 Dairy Cattle Judging 1(0,2) F**

Judging major breeds of dairy cattle. Type classification. May include participation in regional dairy cattle or national collegiate cattle judging contests. Maximum of two credits. P, 212.

**321 Dairy Product Processing I 5(4,3) F (1987)**

Principles and practices in assembling, receiving, processing, and packaging milk and cream for beverage use; cultured milk and cream, frozen milk and cream; concentrated milks; and ice cream. Sanitation procedures. P, 130, 221 and Micr 231 desirable.

**322 Dairy Product Processing II 5(4,3) S (1988)**

Processing or manufacturing of relatively nonperishable dairy products such as butter, cheese, dried milk, casein, lactose, and anhydrous milkfat. P, 321 desirable.

**400 Dairy Seminar 1(1,0) F**

Review of scientific literature and other items of special interest to dairy majors. P, senior standing.

**401 Advanced Dairy Products Judging 1(0,3) F**

Quality evaluation of dairy products. Usually includes participation in national collegiate dairy products contest. P, 202. Maximum of 2 credits.

**411 Dairy Breeds & Breeding 2(2,0) S (1988)**

Origin, genetics, characteristics, and development of major breeds of dairy cattle. Breeding and selection based on pedigrees, production records, type classification, and sire analysis. P, 130.

**412 Dairy Farm Management 3(3,0) F (1987)**

Dairy herd management practices, production testing, labor requirements, buildings and equipment maintenance, crop systems, merchandising cattle and milk. Dairy farm capital, budgets, and credits; and factors affecting economic returns of dairy farming. P, 130 or consent.

**421 Dairy Plant Management 3(3,0) F (1986)**

General costs, buildings, equipment, merchandising, personnel, other management factors of dairy processing plants. P, junior standing or consent.

**422 Technical Control of Dairy Products II 4(3,3) S**

Physical and chemical properties of milk constituents and their effect on processing, testing, and nutritive value of milk and its products. Intentional or accidental additives, their effect and significance. Laboratory tests for process control or legal compliance. P, 221, Chem 120 or equivalent.

**432 Dairy Cattle Feeding 3(3,0) S (1986)**

Practical considerations involved in feeding dairy cattle. P, AS 223.

**492 Special Problems in Dairy Science 1-3 (As arranged) FSSu**

Investigation of problems in dairy production or dairy manufacturing. Results to be submitted as a technical paper. P, Junior or Senior standing plus consent. Maximum of 3 cr. for B.S. degree.

**494, 495, 496 Cooperative Education/Internship/Field Experience 3-12 hrs. FSSu**

On the job experience to supplement knowledge gained in the classroom. A written job description and work plan will be required. Emphasis will be on total educational value of the experience for the student. Written reports will be submitted to a designated departmental faculty member who will serve as major adviser during the time of the practicum. P, permission of department program coordinator.

**Graduate Courses****512-612 Physiology of Lactation 3(3,0) S (1987)**

Anatomy, physiology, and biochemistry of mammary glands. Factors affecting quality and quantity of milk. P, Vet 323 or equivalent.

**522-622 Advanced Dairy Microbiology 3(2,3) S (1988)**

Role of microorganisms in manufacture and spoilage of manufactured dairy product. P, 301 or Micro 311.

**531-631 Laboratory Techniques in Dairy Science 2(0,6) F (1986)**

Current research techniques including photometry; selective ion electrodes; and column, thin-layer, and gas chromatography of milk and plant or animal tissues. P, Chem 260 and consent.

**590-690 Dairy Science Problems 1-3 FSSu**

Investigation of problems in dairy production or dairy manufacturing. Results submitted as a technical paper. P, consent.

**702 Seminar 1(1,0) S****711 Ruminology 3(3,0) F (1987)****790 M.S. Thesis in Dairy Science (as arranged)****890 Ph.D. Thesis in Dairy Science (as arranged)****Economics (Econ)****College of Agriculture and Biological Sciences**

Professor Murra, Acting Head; Professors Allen, Dobbs, Gilbert, Greenbaum, Hsia, Kamps, Kim, Lamberton, Lundeen, Lyons, Taylor; Professors Emeriti Helfinstine, Kohlmeyer, Myers, Smythe; Associate Professors Janssen, Peterson, Shane; Assistant Professors Goodenow, B. Schmiesing, M. Schmiesing, Toland; Instructors Ellingson, Rasmussen.

Economics is a study of efforts to acquire and use wealth and income. Work in this department is concerned not only with basic economic principles, but also with such specialized applications of economics as are found in agricultural economics, agricultural business, and industrial economics.

The objectives of the curricula taught in the Economics Department are to:

- 1) present the general economic principles necessary for the student to understand the complexities of the economic and business world;
- 2) train the student to apply economic concepts and techniques for decision-making in fields such as agricultural business, agricultural economics and commercial economics; and,
- 3) provide a foundation for graduate work in economics, agricultural economics, business administration, finance, law and other related areas of study.

The Economics Department offers majors leading to a Bachelor of Science Degree in either Agricultural Business or Agricultural Economics from the College of Agriculture and Biological Sciences. The Department also offers a major in Economics leading to either a Bachelor of Science or a Bachelor of Arts Degree from the College of Arts and Science. Within the Economics Major, a student can choose an option in either Commercial Economics or General Economics.

The baccalaureate programs in the Economics Department are designed to provide students with a background to pursue careers in farm and ranch management, agricultural finance, agricultural supply and marketing industries, banking, business finance, business management, sales and marketing, government service and related fields.

**Curriculum in Agriculture****Agricultural Business Major<sup>6</sup>**

Leading to the Bachelor of Science Degree

Freshman Year	F	S
Fr Comp, Engl 101.....	3	or 3
Fund of Speech, SpCm 101.....	3	or 3
Fitness & Lifetime Activities, PE 100.....	1	1
Intro to Sociology, Soc 100.....	3	
Biological Science elective <sup>1-5</sup> .....	3	
Intro Physics, Phys 101, or Elementary Physics, Phys 111, or Gen Physics, Phys 211 <sup>5</sup> .....		4
Group I electives <sup>2</sup> .....	3	3
Algebra, Math 111.....	3	
General electives.....		4
	<hr/>	<hr/>
	16	15

**Sophomore Year**

	F	S
Macroeconomic Principles, Econ 201.....	3	
Microeconomic Principles, Econ 202.....		3
Money & Banking, Econ 330.....		3
Humanities electives <sup>1</sup> .....	3	
Gen Chem, Chem 110 or 112 <sup>5</sup> .....	4	

Prin of Accounting I, Actg 210.....	3			Farm and Ranch Management, AgEc 271.....	4		
Prin of Accounting II, Actg 211.....		3		Calculus for Non-Math Majors, Math 222, or		3	
Group I elective <sup>2</sup> .....			2	Mathematical Analysis I, Math 123.....			5
Farm and Ranch Management, AgEc 271.....	4			Group I electives <sup>2</sup> .....	2		3
Calculus for Non-Math Majors, Math 222, or							
Mathematical Analysis I, Math 123.....			5			16	17
	17		16	<b>Junior Year</b>			
<b>Junior Year</b>	F		S	Junior Comp, Engl 300.....	3		S
Junior Comp, Engl 300.....	3			Technical Communications Engl 303.....			3
Technical Communications, Engl 303.....		3		Intermediate Microeconomics, Econ 301.....	3		3
Intermediate Microeconomics, Econ 301.....	3			Intermediate Macroeconomics, Econ 302.....			3
Intermediate Macroeconomics, Econ 302.....		3		Statistical Methods I, Stat 341.....			3
Statistical Methods I, Stat 341.....	3			Computer Programming and Data Processing,			
Computer Programming and Data Processing,			3	CSc/Math 271, or equivalent.....	4		
CSc/Math 271, or equivalent.....	4			Agricultural Finance, AgEc 478.....			3
Agricultural Marketing, AgEc 354.....		3		Agricultural Marketing, AgEc 354.....	3		
Business Law I, B-Ad 350.....		3		Natural Science electives (sequence course) <sup>1-5</sup> ...	3-4		
Agricultural Finance, AgEc 478.....		4		General elective.....	0-1		3
Natural Science elective (sequence course) <sup>1-5</sup> ...	3-4					17	15

	16-17		15	<b>Senior Year</b>			
<b>Senior Year<sup>4</sup></b>	F		S	Communications elective <sup>3</sup> .....	2-3		S
Communications elective <sup>3</sup> .....	2-3			Public Finance, Econ 433.....			3
Operations Research, B-Ad 326.....	4			One of the following: Comparative Econ Sys-			
Managerial Economics, Econ 427.....		3		tems, Econ 405; History of Econ Thought,			
Agricultural Policy, AgEc 479.....		3		Econ 504; or Econ History of U.S., Hist			
Humanities elective <sup>1</sup> .....	3			377 <sup>4</sup> .....			3
Two additional courses prefixed AgEc.....		6		Production Econ, AgEc 421.....	3		
Electives in Actg, AgEc, B-Ad, or Econ.....	6			Agricultural Policy, AgEc 479.....			3
Natural Science, Social Science, or Humani-			3	Mathematical Economics, Econ 428.....			3
ties elective <sup>1-5</sup> .....			1-2	Social Science elective <sup>4</sup> .....	3		
General electives.....	0-1			Statistics II, Econ 423.....	3		
	16		16-17	Natural Science, Social Science, or Humani-			
				ties electives.....			3
				General electives.....	4-5		2

<sup>1</sup>Humanities, Social Science, and Biological Science electives chosen from the list on pages 15-16. Biological science electives must be chosen from Biology, Botany, Entomology, Microbiology, and Zoology. Social Science electives must be from outside the Economics Department.

<sup>2</sup>Group I electives are listed on page 31.

<sup>3</sup>Communications electives must be chosen from Creative Writing, Engl 383; Public Speaking, SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335; Newswriting & Reporting, MCom 210; Publicity Methods, MCom 313; and Magazine Writing & Editing, MCom 315.

<sup>4</sup>Bear in mind students must take Social Science courses bearing two prefixes.

<sup>5</sup>All students must complete two science courses from the same sequence, as identified in the list on page 15-16.

<sup>6</sup>Students interested in the international option in agriculture should refer to page 33.

### Curriculum in Agriculture

#### Agricultural Economics Major<sup>6</sup>

Leading to the Bachelor of Science Degree

<b>Freshman Year</b>	F		S
Fr Comp, Engl 101.....	3	or	3
Fund of Speech, SpCm 101.....	3	or	3
Fitness & Lifetime Activities, PE 100.....	1		1
Intro to Sociology, Soc 100.....	3		
Humanities elective <sup>1</sup> .....	3		
Intro Physics, Phys 101; Elementary Physics,			
Phys 111; or Gen Physics, Phys 211 <sup>5</sup> .....	4		
Group I elective <sup>2</sup> .....	3		
Biological Science elective <sup>1-5</sup> .....	3		
Algebra, Math 111.....	3		
General electives.....		4	
	16		15

#### Sophomore Year

Macroeconomic Principles, Econ 201.....	3		S
Microeconomic Principles, Econ 202.....		3	
Money & Banking, Econ 330.....		3	
Humanities electives <sup>1</sup> .....		3	
General Chem, Chem 110 or 112 <sup>5</sup> .....	4		
Prin of Accounting I, Actg 210.....	3		

<sup>1</sup>Humanities, Social Science, and Biological Science electives chosen from the list on pages 15-16. Biological Science electives must be chosen from Biology, Botany, Plant Science, Microbiology, and Zoology.

<sup>2</sup>Group I electives are listed on page 31.

<sup>3</sup>Communications electives must be chosen from Creative Writing, Engl 383; Public Speaking, SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335; Newswriting & Reporting, MCom 210; Publicity Methods, MCom 313; and Magazine Writing & Editing, MCom 315.

<sup>4</sup>General elective for students who elected to take Hist 377 above. Social Science electives must be from outside the Economics Department.

<sup>5</sup>All students must complete two science courses from the same sequence, as identified in the list on page 15-16.

<sup>6</sup>Students interested in the international option in agriculture should refer to page 33.

### Curriculum in Arts and Science, Economics Major

#### Commercial Economics Option

Leading to the Bachelor of Arts Degree

<b>Freshman Year</b>	F		S
Fr Comp, Engl 101.....	3	or	3
Fund of Speech, SpCm 101.....	3	or	3
Fitness & Lifetime Activities, PE 100.....	1		1
Foreign Language <sup>1</sup> .....	4		4
Social Science elective <sup>2</sup> .....			3
Algebra, Math 111.....	3		
Natural Science electives (sequence courses) <sup>2-7</sup> .....	3-4		3-4
General elective.....	1-2		1-2
	16		16

#### Sophomore Year

Macroeconomic Principles, Econ 201.....	3		S
Microeconomic Principles, Econ 202.....		3	
Money & Banking, Econ 330.....		3	
Foreign Language <sup>1</sup> .....	3		3

Prin of Accounting I, Actg 210.....	3
Prin of Accounting II, Actg 211.....	3
Computer Programming & Data Processing, CSc/Math 271, or equivalent.....	4
Calculus for Non-Math Majors, Math 222, or Mathematical Analysis I, Math 123.....	5
General elective.....	2
	<hr/>
	16

**Junior Year<sup>3,4</sup>**

Junior Comp, Engl 300.....	3
Technical Communications, Engl 303.....	3
Intermediate Microeconomics, Econ 301.....	3
Intermediate Macroeconomics, Econ 302.....	3
Statistical Methods I, Stat 341.....	3
Business Law I, B-Ad 350.....	3
Business Finance, B-Ad 310.....	3
Business Management, B-Ad 360.....	3
Marketing, Econ 353.....	3
Humanities electives <sup>2</sup> .....	1
General elective.....	1
	<hr/>
	16

**Senior Year**

Public Finance, Econ 433.....	3
Social Science elective <sup>2,5</sup> .....	3
Humanities electives <sup>2</sup> .....	3
Managerial Economics, Econ 427.....	3
Communications elective <sup>6</sup> .....	2-3
Operations Research, B-Ad 326.....	4
One of the following: Comparative Econ Sys- tems, Econ 405; History of Econ Thought, Econ 504; or Econ History of U.S., Hist 377.....	3
Electives in Actg, AgEc, B-Ad, or Econ.....	3
General electives <sup>7</sup> .....	0-1
	<hr/>
	16

Prin of Accounting I, Actg 210.....	3	
Prin of Accounting II, Actg 211.....	3	3
Computer Programming & Data Processing, CSc/Math 271, or equivalent.....	4	4
Calculus for Non-Math Majors, Math 222, or Mathematical Analysis I, Math 123.....	5	5
Physical science electives <sup>1,6</sup> .....		3-4
Humanities elective <sup>1</sup> .....	3	
General electives.....	1-2	
	<hr/>	
	16	16

**Junior Year<sup>2,3</sup>**

Junior Comp, Engl 300.....	3	F	S
Technical Communications, Engl 303.....	3		3
Intermediate Microeconomics, Econ 301.....	3		3
Intermediate Macroeconomics, Econ 302.....	3		3
Statistical Methods I, Stat 341.....	3		3
Business Finance, B-Ad 310.....	3		3
Business Management, B-Ad 360.....	3		3
Business Law I, B-Ad 350.....	3		3
Social Science elective <sup>1,4</sup> .....	3		3
Marketing, Econ 353.....	3		3
General electives <sup>1</sup> .....	1		1
	<hr/>		
	16	16	16

**Senior Year**

Public Finance, Econ 433.....	3	F	S
Managerial Economics, Econ 427.....	3		3
Communications elective <sup>5</sup> .....	2-3		3
Operations Research, B-Ad 326.....	4		3
One of the following: Comparative Econ Sys- tems, Econ 405; History of Econ Thought, Econ 504; or Econ History of U.S., Hist 377.....	3		3
Electives in Actg, AgEc, B-Ad, or Econ.....	3		3
Humanities electives.....	7		7
General electives <sup>3</sup> .....	0-1		3
	<hr/>		
	16	16	16

<sup>1</sup>Two years of one foreign language (French, German, Spanish).

<sup>2</sup>Natural Science, Social Science, and Humanities electives chosen from the list on pages 15-16. Bear in mind that 6 credit hours of International Studies must be included among these electives. Social Science electives must be from outside the Economics Department.

<sup>3</sup>Students wishing to prepare for high school teaching should consult with the dean of the Education Division before registering for the first term of their junior year.

<sup>4</sup>All students must complete a minimum of 40 semester hours in courses numbered 300 or above to qualify for the degree.

<sup>5</sup>General elective if Hist 377 is elected in the choice above.

<sup>6</sup>Communications electives must be chosen from Creative Writing, Engl 383; Public Speaking, SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335; Newswriting & Reporting, MCom 210; Publicity Methods, MCom 313; and Magazine Writing and Editing, MCom 315.

<sup>7</sup>All students must complete two science courses from the same sequence, as identified in the list on page 15-16.

<sup>1</sup>Physical and Biological Science, Social Science, and Humanities electives chosen from the list on pages 15-16. Bear in mind that 6 credit hours of International Studies must be included among these electives. Social Science electives must be from outside the Economics Department.

<sup>2</sup>Students wishing to prepare for high school teaching should consult with the dean of the Education Division before registering for the first term of their junior year.

<sup>3</sup>All students must complete a minimum of 40 semester hours in courses numbered 300 or above to qualify for the degree.

<sup>4</sup>General elective if Hist 377 is elected in the choice above.

<sup>5</sup>Communications electives must be chosen from Creative Writing, Engl 383; Public Speaking, SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335; Newswriting & Reporting, MCom 210; Publicity Methods, MCom 313; and Magazine Writing & Editing, MCom 315.

<sup>6</sup>All students must complete two science courses from the same sequence, as identified in the list on page 15-16.

**Curriculum in Arts and Science, Economics Major  
Commercial Economics Option**

Leading to the Bachelor of Science Degree

**Freshman Year**

Fr Comp, Engl 101.....	3	or	3
Fund of Speech, SpCm 101.....	3	or	3
Fitness & Lifetime Activities, PE 100.....	1		1
Biological Science electives <sup>1,6</sup> (sequence courses).....	3		3
Social Science electives <sup>1</sup> .....	3		3
Algebra, Math 111.....	3		3
General electives <sup>6</sup> .....	6		6
	<hr/>		
	16		16

**Sophomore Year**

Macroeconomic Principles, Econ 201.....	3	F	S
Microeconomic Principles, Econ 202.....	3		3
Money & Banking, Econ 330.....	3		3

**Curriculum in Arts & Science, Economics Major  
General Economics Option**

Leading to the Bachelor of Arts Degree

**Freshman Year**

Fr Comp, Engl 101.....	3	or	3
Fund of Speech, SpCm 101.....	3	or	3
Fitness & Lifetime Activities, PE 100.....	1		1
Foreign Language <sup>1</sup> .....	4		4
Social Science elective <sup>2</sup> .....	3		3
Algebra, Math 111.....	3		3
General electives.....	5		5
	<hr/>		
	16		16

**Sophomore Year**

Macroeconomic Principles, Econ 201.....	3	F	S
Microeconomic Principles, Econ 202.....	3		3
Money & Banking, Econ 330.....	3		3
Foreign Language <sup>1</sup> .....	3		3

Prin of Accounting I, Actg 210.....	3	
Computer Programming & Data Processing, CSc/Math 271, or equivalent.....	4	
Calculus for Non-Math Majors, Math 222, or Mathematical Analysis I, Math 123.....	5	
Social Science electives <sup>2,7</sup> .....	3	
General electives <sup>7</sup> .....	2	
	<hr/>	<hr/>
	16	16

**Junior Year<sup>3,4</sup>**

Junior Comp, Engl 300.....	3	F
Technical Communications, Engl 303.....	3	S
Intermediate Microeconomics, Econ 301.....	3	
Intermediate Macroeconomics, Econ 302.....	3	
Statistical Methods I, Stat 341.....	3	
Electives <sup>2</sup> .....	3	
Natural Science electives (sequence courses) <sup>2,7</sup>	3-4	3-4
Humanities electives <sup>2</sup> .....	3	
General electives.....	0-1	0-1
	<hr/>	<hr/>
	16	16

**Senior Year**

Public Finance, Econ 433.....	3	F
Communications elective <sup>6</sup> .....	2-3	S
One of the following: Comparative Econ Sys- tems, Econ 405; History of Econ Thought, Econ 504; or Econ History of the U.S., Hist 377.....	3	
Humanities electives <sup>2</sup> .....	3	
Statistics II, Econ 423.....	3	
Mathematical Economics, Econ 428.....	3	
Electives in Actg, AgEc, B-Ad, or Econ.....	3	
General electives <sup>7</sup> .....	1-2	
	<hr/>	<hr/>
	16	16

Calculus for Non-Math Majors, Math 222, or Mathematical Analysis I, Math 123.....	5	
Social Science elective <sup>1</sup> .....	5	3
General elective.....	5	3
	<hr/>	<hr/>
	16	16

**Junior Year<sup>2,3</sup>**

Junior Comp, Engl 300.....	3	F	S
Technical Communications, Engl 303.....	3		3
Intermediate Microeconomics, Econ 301.....	3		3
Intermediate Macroeconomics, Econ 302.....	3		3
Statistical Methods I, Stat 341.....	3		
Humanities electives <sup>1</sup> .....	3		
Social Science elective <sup>1,4</sup> .....	3		3
Physical science electives <sup>1-6</sup> .....	3-4		3-4
General electives <sup>3</sup> .....	4		3-4
	<hr/>	<hr/>	<hr/>
	16	16	16

**Senior Year**

Public Finance, Econ 433.....		F	S
Communications elective <sup>4</sup> .....	2-3		3
One of the following: Comparative Econ Sys- tems, Econ 405; History of Econ Thought, Econ 504; or Econ History of the U.S., Hist 377.....	3		
Humanities electives <sup>1</sup> .....	3		3
Statistics II, Econ 423.....	3		
Mathematical Economics, Econ 428.....	3		3
Electives in Actg, AgEc, B-Ad or Econ.....	6		3
General electives <sup>3,6</sup> .....	1-2		2
	<hr/>	<hr/>	<hr/>
	15-17	14	14

<sup>1</sup>Two years of one foreign language (French, German, Spanish).  
<sup>2</sup>Natural Science, Social Science, and Humanities electives chosen from the list on pages 15-16.  
 Bear in mind that 6 credit hours of International Studies must be included among these electives.  
 Social Science electives must be from outside the Economics Department.  
<sup>3</sup>Students wishing to prepare for high school teaching should consult with the dean of the Educa-  
 tion Division before registering for the first term of their junior year.  
<sup>4</sup>All students must complete a minimum of 40 semester hours in courses numbered 300 or above to  
 qualify for the degree.  
<sup>5</sup>Three hours of this requirement is a general elective if Hist 377 is elected in the choice above.  
<sup>6</sup>Communications electives must be chosen from Creative Writing, Engl 383; Public Speaking,  
 SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335; Newswriting & Report-  
 ing, MCom 210; Publicity Methods, MCom 313; and Magazine Writing & Editing, MCom 315.  
<sup>7</sup>All students must complete two science courses from the same sequence, as identified in the list  
 on page 15-16.

<sup>1</sup>Biological Science, Social Science, and Humanities electives chosen from the list on pages 15-16.  
 Bear in mind that 6 credit hours of International Studies must be included among these electives.  
 Social Science electives must be from outside the Economics Department.  
<sup>2</sup>Students wishing to prepare for high school teaching should consult with the dean of the Educa-  
 tion Division before registering for the first term of their junior year.  
<sup>3</sup>All students must complete a minimum of 40 semester hours in courses numbered 300 or above to  
 qualify for the degree.  
<sup>4</sup>General elective if Hist 377 is elected in the choice above.  
<sup>5</sup>Communications electives must be chosen from Creative Writing, Engl 383; Public Speaking,  
 SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335; Newswriting & Report-  
 ing, MCom 210; Publicity Methods, MCom 313; Magazine Writing & Editing, MCom 315.  
<sup>6</sup>All students must complete two science courses from the same sequence, as identified in the list  
 on page 15-16.

**Curriculum in Arts & Science, Economics Major  
 General Economics Option  
 Leading to the Bachelor of Science Degree**

<b>Freshman Year</b>	F	S
Fr Comp, Engl 101.....	3 or	3
Fund of Speech, SpCm 101.....	3 or	3
Fitness & Lifetime Activities, PE 100.....	1	1
Biological Science electives (sequence courses) <sup>1,6</sup> .....	3	3
Algebra, Math 111.....	3	
General electives <sup>6</sup> .....	6	9
	<hr/>	<hr/>
	16	16

**Sophomore Year**

Macroeconomic Principles, Econ 201.....	3	F	S
Microeconomic Principles, Econ 202.....	3		3
Money & Banking, Econ 330.....	3		3
Prin of Accounting I, Actg 210.....	3		
Computer Programming & Data Processing, CSc/Math 271, or equivalent.....	4		

Students wishing to take a major in Economics with emphasis on mathematics and statistics should consult adviser.

**Minor:** Econ 201, 202, and two courses selected from Econ 301, 302, 330, 433 and Stat 341 and three additional courses prefixed Actg, B-Ad, AgEc, Econ, or Stat.

**International Studies:** For the international option in agriculture, refer to page 33. For the international specialization for all Economics Department majors and minors, consult with any Economics Department academic advisor.

Courses in the economics department are offered in the following areas: Accounting (Actg), Agricultural Economics (AgEc), Business Administration (B-Ad) and Economics (Econ).

**Accounting (Actg)**

**Undergraduate Courses**

- 210 Prin of Accounting I 3(3,0) FS**  
 Basic accounting cycle; financial statements; asset valuation; accounting controls and concepts, payrolls, payroll taxes and an introduction to the corporate capital accounts. Understanding of fundamental procedure and accounting theory.
- 211 Prin of Accounting II 3(3,0) FS**  
 Accounting for partnerships and corporations; an introduction to cost accounting, budgeting, and other accounting reports for management, creditors, and investors. P, 210.

## Agricultural Economics (AgEc)

### Undergraduate Courses

#### 271 Farm & Ranch Management 4(3,2) FS

Farm or ranch business from viewpoint of continuous profit and efficiency. Basics of farm management applied to selection and combination of enterprises, level of production, size of business, labor efficiency, and machinery efficiency. Types of farming, tenure and leasing, risk, prices, credit and starting farming. Business and production records, their analysis and use in budgeting and planning future operations. P, Math 111.

#### 354 Agricultural Marketing and Prices 3(3,0) FS

Principle factors which affect the supply, demand and prices of agricultural commodities. Market information in forecasting price trends. Evaluation of alternate marketing strategies, e.g., futures trading, other forward pricing instruments. Alternative agricultural marketing institutions. P, 201 or 202.

#### 373 and PS 373 Rural Real Estate Appraisal 3(2,2) F

Principles and practices of rural real estate appraisal. Principles of soils valuation and their application for farmland appraisal. Cost, market data and income approaches to farmland and building appraisal. Introduction to tax loan and other specialized rural appraisal procedures. Half-day field trips to area farms are required. P, Ag Econ 271 and Plant Science 113.

#### 421 Production Economics 3(3,0) F

Input-output analysis involving single and multiple inputs and products; types of production functions; technological changes; short run vs. long run supply; returns to scale and size; decision theory. P, Econ 301.

#### 454 Economics of Grain and Livestock Marketing 3(3,0) F

Application of advanced grain and livestock marketing principles in U.S. and World Markets. Marketing management alternatives for producers, processors and handlers. The cooperatives' role in domestic and international marketing. P, Ag Ec 354 or AS 285 with Econ 202 recommended.

#### 478 Ag Finance 3(3,0) S

Capital and credit needs in agriculture; principles and problems in extending and using credit; developing information flows, capital budgeting, cost of capital, the role of financial intermediaries; control of land and depreciable assets. P, 271 and Econ 202. Econ 330, recommended.

#### 479 Agricultural Policy 3(3,0) S

Economic policies affecting agricultural prosperity, with special emphasis on farm programs, food assistance programs, agricultural trade, finance, bargaining and other institutional forces affecting agriculture and agri-business. Implication of agricultural policy alternatives on people living in rural and urban areas. P, 201, 202.

#### 490 Ag Econ Problems 1-3(1-3,0) FS

Individual study of special topics or problems of concern to agriculture and agri-business. May involve case studies, special readings, and reports. Maximum of 4 hours. P, consent.

### Graduate Courses

#### 530-630 Advanced Ag Marketing & Prices 3(3,0) (Offered in F 1987)

The marketing environment; market structure, performance and conduct; measurement and forecasting; pricing problems and policies; financing and risk; marketing alternatives; efficiency; market power; social, legal and ethical issues; marketing and policy. P, 301, Stat 341.

#### 570-670 Advanced Farm & Ranch Management 3(3,0) S

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

#### 590-690 Special Problems 1-3(1-3,0) FS

Advanced work or special problems in agricultural cooperation, agricultural finance, farm management, land economics, marketing, public finance, statistics. Open to qualified senior and graduate students. P, consent.

## Business Administration (B-Ad)

**Business Area Studies.** Students preparing for various positions in management and business should consult the list of courses under BUSINESS AREA STUDIES on page 67. Many of the courses listed there are offered by departments other than the Economics Department including other cooperating public colleges and universities and some are of more specific interest to students in majors outside this department.

## Undergraduate Courses

#### 310 Business Finance 3(3,0) FS

Capital and credit needs of business firms; principles and problems in extending and using business credit; analysis of financial statements; financial management; planning and financing capital structure; market for and investing in debt and equity securities. P, Actg 210 or equivalent, junior standing or consent.

#### 326 Operations Research 4(4,0) FS

Development of selected quantitative tools and methods used in the decision making process of business organizations. Topics include linear programming, decision making under uncertainty, simulation, inventory models, and queuing models. P, Econ 301, Stat 341.

#### 350 Business Law I 3(3,0) FS

Survey of judicial system and process, legal aspects of criminal law, torts, contracts, landlord/tenant law and domestic relations. Emphasis is on South Dakota law.

#### 351 Business Law II 3(3,0) FS

Legal rights and duties of parties to business transactions — sales security devices and insurance, partnerships, corporations, real property, estates and bankruptcy. P, 350.

#### 360 Business Management 3(3,0) FS

The process of management, including functions of planning, organizing, directing, controlling, and coordinating. Emphasis is on the business situation. Thus other disciplines such as finance and marketing are discussed as they apply to the basic functions. P, junior standing or consent.

#### 380 Personal Finance 3(3,0) FS

Survey of individual investment opportunities, including common and preferred stock and corporate bonds; auto, health and life insurance; home ownership; wills and estate planning.

## Economics (Econ)

### Undergraduate Courses

#### 201 Macroeconomics Principles 3(3,0) FS

Analysis of U.S. economy. Money and banking. Federal Reserve policy, national income, government spending, taxation, business fluctuations, and levels of employment and prices. Introduction to supply and demand, business organization, world trade, economic growth, and economic systems. P, Math 111 or equivalent.

#### 202 Microeconomics Principles 3(3,0) FS

Analysis of price as it allocates resources and distributes income. Theory of firm, supply and demand, economic efficiency, types of competition in markets, marginal productivity and wage determination; public interest in industry, agriculture, labor and individual welfare. P, Math 111 or equivalent.

#### 301 Intermediate Microeconomics 3(3,0) FS

Scope and method of economic analysis. Pricing process under varying degrees of competitive conditions and role of price in allocation of resources. Introduction to theory of income distribution. P, 202, Math 222 or equivalent.

#### 302 Intermediate Macroeconomics 3(3,0) FS

Determinants of national income, employment and price level in free enterprise system with particular attention to aggregate consumption, investment and government spending. In addition, there will be brief consideration of methods of maintaining a high level of employment and income and related aspects of economic policy. P, 201, 202, Math 111 or equivalent.

#### 330 Money & Banking 3(3,0) FS

Principles of money, banking, and credit; major types of financial institutions and their significant functions and policies. P, 201 or 202, sophomore standing.

#### 353 Marketing 3(3,0) FS

Marketing; market organization and the role of cooperative marketing functions; pricing; efficiency, and role and management of marketing activities in today's business organization. P, 202.

#### 382 Labor, Law & Econ 3(3,0) F

History and development of the U.S. labor movement; the labor market in a market economy from firm's and union's viewpoint; collective bargaining; public policy toward collective bargaining. P, 201 or 202, junior standing.

#### 391 and HE391 Consumers & the Market 3(3,0) FS

(Offered on demand) Factors important to families as purchasing agents and consumers; standardization of goods; grading, branding, labeling, packaging; advertising; consumer practices affecting cost; analysis of programs for consumer protection; the market structure. Principles of maximization of consumer satisfaction. P, junior standing or consent.

#### 405 Comparative Econ Systems 3(3,0) S

Philosophy, organization, and operation of various economic systems — Capitalism, Socialism, Communism, Fascism, etc. Impact of various levels of industrial and agricultural development on the structure of selected economic systems. P, 201 plus 9 hours of Hist, Econ, PolS, and/or Soc.

#### 423 Statistics II 3(3,0) F

Probability, point and interval estimation, tests of hypotheses, multiple regression and correlation, chi-square analysis, and analysis of variance. P, Stat 341, Math 222 or equivalent.

#### 427 Managerial Economics 3(3,0) FS

Applications of economic theory (Accounting, Finance, managerial concepts, quantitative techniques, and Business Law) to management problem situations. Case study approach. P, senior standing, B-Ad 326.

#### 428 Mathematical Economics 3(3,0) S

Study of mathematical methods in introductory calculus and linear algebra and their applications to economic analysis. Mathematical analysis of static and dynamic partial and general equilibrium models, production functions, activity analysis, distribution, cycles, growth, mathematical programming, and model building. P, 301, 302, Math 222 or equivalent.

#### 433 Public Finance 3(3,0) FS

Principles, problems and history of public revenues, and public expenditures. Problems of attaining an equitable distribution of burdens and benefits. P, 201, 202.

#### 452 Marketing Management 3(3,0) F

(Offered on demand) Role of cooperatives in marketing. Present organization and emerging developments in input and product markets. Marketing alternatives for producers. Introduction to international marketing. P, 353 or AgEc 354.

#### 453 Risk Management — Personal & Business 3(3,0) F

Protection against or adaptation to risk and uncertainty. Includes principles and practices of fire, casualty, surety, and life insurance and other risk management techniques.

#### 490 Economics Problems 1-3(1-3,0) FS

Individual study. May involve case studies, special reports, assigned readings, analysis of data and report preparation. Maximum of 4 hours. P, consent.

#### 491 Special Topics 1-4

Organized by an instructor in consultation with his or her 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 shot deal" for a particular semester and the unique group of students. Maximum: 4 hours credit per semester, 7 hours credit per degree.

#### 494-495-496 Cooperative Education/Internship/Field Experience 1-12 FS

Supervised field experience with commercial firm, bank, credit agency, or public agency to increase applicability of classroom learning to professional needs. Variety and educational value are emphasized. Job description by employer and final reports required. May be repeated for credit. P, junior standing, consent.

## Graduate Courses

#### 504-604 History of Econ Thought 3(3,0) F

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

#### 520-620 Economics of the Public Sector 3(3,0) S 1987

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

#### 540-640 Econ of the International Sector 3(3,0) on demand

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

#### 550-650 Industrial Organization 3(3,0) S 1987

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

#### 560-660 Economic Development 3(3,0) F 1987

Economic development theory, methods of analyzing regional and national development in developing and developed economies. Role of public policy in development process. Agricultural and rural development issues emphasized.

#### 572-672 Resource Economics 3(3,0) F 1986, S 1988

Economic analysis and planning applied to natural resource use. Environmental economics, energy economics, water and land use, and methods of evaluating projects and programs.

#### 590-690 Special Problems 1-3(1-3,0) FS

Advanced work in special problems in agricultural cooperation, agricultural finance, farm management, land economics, marketing, public finance, statistics. Open to qualified seniors and graduate students by consent.

#### 701 Research Methods 2(2,0) S

#### 702 Seminar in Economics 1(1,0)

#### 703 Advanced Macroeconomics 3(3,0) S

#### 704 Advanced Microeconomics 3(3,0) F

#### 705 Applied Economic Theory 3(3,0) S

#### 724 Advanced Quantitative Economics 3(3,0) F

#### 790 M.S. Thesis (as arranged)

#### 791 Graduate Special Topics 1-4

#### 793 Research Paper (2,0)

## Education (Ed)

### Division of Education

Professor Jensen, Dean; Professors Edeburn, Everett, Hanson, Larsen, Lingren, Widvey; Professor Emeritus Sundet, Scholten; Associate Professors Moeller, Pedersen, Ristow, Smith, Steinley; Assistant Professors Bell, Butler, Erion, Hofland, Ivers, Mitchum; Instructor Sheeley.

The courses in education are divided into the following areas: Agricultural Education (AgEd), Adult Higher Education (AHed), Counseling, Guidance and Personnel Services (CGPS), Driver's Education (DrEd), Educational Administration (EdAd), Education, Evaluation and Research (EdER), Educational Foundations (EdFn), Elementary Education (ElEd), Education Psychology (EPsyc), Secondary Education (SeEd), and Vocational Teacher Training Education (VTTE).

### Agricultural Education (AgEd)

Professor Hanson, Supervisor

The National Vocational Education Acts require and provide for Vocational Agriculture teacher training. This has been assigned to SDSU, and has been approved by the State Office of Vocational Education. Accordingly, the College of Agriculture and Biological Sciences and the Division of Education cooperate in offering such teacher preparation. Students preparing to teach complete all the required core courses in the College of Agriculture. They earn a major in Agricultural Education, with supporting preparation in technical agriculture, basic sciences, and communications skills to make up the total requirement. Teachers of Vocational Agriculture in South Dakota receive the appropriate certificate to teach in high school, issued by the Division of Education. The professional education requirement is 28 semester credits in education including student teaching vocational agriculture. The student teaching is done in designated agriculture departments of high schools in South Dakota, western Minnesota, and northwest Iowa.

Students enrolled in this curriculum must file an application with the Agricultural Education Office prior to enrolling in professional education courses. Admission to such courses is based on the following minimum qualifications: a Graduation Ratio of 2.5 for admission to education courses, and an all University Graduation Ratio of 2.5 and a 2.6 Graduation Ratio in major courses and in professional education courses for student teaching. Membership and participation in the Agricultural Education Club are strongly encouraged. Since there are many courses in common with Agricultural Extension, some students may desire to complete the requirements of both curriculums in order to qualify for employment in Extension and teaching.



## Curriculum in Agricultural Education

Leading to the Bachelor of Science Degree

### Freshman Year

General Horticulture, Ho 111.....	F	3
Fitness & Lifetime Activities, PE 100.....	1	1
Crop Production, PS 103.....	3	3
Intro to Animal Science, AS 101.....	3	3
Elements of Dairying, DS 130.....	3	3
General Psychology, Psyc 101.....	3	3
Introductory Biology, Bio 151.....	3	3
General Chemistry, Chem 110.....	4	4
Fr. Comp., Engl 101.....	3	3
College Algebra, Math 111.....		3
Elective.....		2

16

### Sophomore Year

Introductory Physics, Phys 101.....	F	4
Soils, PS 113.....	3	3
Weed Control, PS 343 (F) OR Forage Crops & P. Mgmt., PS 313 (F).....	3	3
Meat: Prod. to Consumption, AS 241.....	3	3
Intro. to Sociology, RS 100.....	3	3
Fund. of Speech, SpCm 101.....	3	3
Ag. Mechanics, MA 202.....	2	2
One of the following: Elem. Organic Chem., Chem 120; Gen. Microbiology, Micr 231; Crop & Lvst. Insects, PS 293 (S); Insect Control Methods, PS 391 (F); Plant Pathology, PS 223 (F).....	(3-4)	(3-4)
Macroeconomic Principles, Econ 201 OR Microeconomic Principles, Econ 202.....	(3)	(3)
Farm Management, Econ 271.....	4	4
Elective.....	1-2	1-2

16-18

### Junior Year

Humanities Elective*.....	F	3
Heredity & Society, Blo 271 OR Genetics, Bio 371.....		2-3
Farm Power & Machinery, MA 213.....	3	2
Elec. for Farm & Home, MA 342.....		2
Indians of N. Am., Anth 421 OR History of Am. Indians, Hist 368.....	3	3
Animal Nutrition, AS 223.....		3
Welding, ES 131.....		2
Seminar in Ag Ed, Ag Ed 301.....	1	1
Prin. of VocEd & Prac Arts, VTTE 405.....	2	2
Educational Psychology, EPsyc 302.....	2	2
Junior Composition, Engl 300.....		3
Two of the following: Prin. of Accounting I, Actg 210; Ag Marketing & Prices, AgEd 354; Ag Finance & Appsl., AgEc 478 (S) (Econ 202 & 271 Prerequisites).....	3-4	3-4
Bus Management, B-Ad 360		
Micro or Macro Econ., Econ 201/202		
A microcomputer course		

17-18

### Senior Year

Humanities Elective*.....	F	3
One of the following: Farm Bldg Mech., Ma 423; Ag Waste Mgmt, MA 463 (F); Proc. Eqpt for Ag Prod, MA 443 (F); Small Power Eqpt, MA 433 (S).....	3	3
Teaching of Reading, SeEd 450.....	3	3
Two of the following: Poultry Management, AS 366 (F); Beef Production, AS 474; Swine Production, AS 478 (S); Sheep & Wool Prod., AS 477 (F) Anim. Dis &		

Their Control, VET 403 (F) (Micr 231 Prerequisite).....	S	6
Publicity methods, Mcom 313, Advanced Exposition, Engl 303 or Parliamentary Procedure, Sp Cm 335.....		2
Spec. Mthds. in AgEd, AgEd 434.....		3
Program Plan in AgEd, AgEd 404.....		4
Student Tchg. in AgEd, AgEd 475.....		8
Teaching Ag Mech, AgEd 454.....		2
		17
		17

## Undergraduate Courses

### 301 Seminar in Agricultural Education 1(1,0) FS

Introduction to vocational education in agriculture. Teaching high school vocational agriculture. Required of AgEd sophomores. P, sophomore standing.

### 404 Program Planning in AgEd 4(8,0) FS

Future Farmers of America Program, Adult Education, and supervised occupational experience programs; policy development. Offered first half of semester in which student does student teaching and resumed following student teaching. P, senior standing in AgEd.

### 406 Problems in AgEd 1-3

Selected studies and activities to meet the needs of undergraduate students.

### 434 Special Methods in AgEd 3(6,0) FS

Aims, course of study selection and organization of subject matter, method in field, laboratory, classroom, and supervised occupational experience programs. Taken first half of semester in which the student does student teaching, and resumed following student teaching. P, AgEd 301, EPsyc 302, SeEd 450.

### 454 Teaching Ag Mech 2(1,3) FS

Shop management, safety, shop plans, selection, care and use of hand and power tools, and equipment, to be taken as part of student teaching block in Agricultural Education. P, senior in Agricultural Education. Offered first half of semester.

### 475 Student Teaching in AgEd 8 credits FS

Required of seniors in agriculture education for certification. Student must have completed at least 40 credits in technical agriculture. Offered last half of semester of which student is qualified to teach. Application for course must be made by students in spring semester of junior year. P, VTTE 405; EPsyc 302; AgEd 301, SeEd 450.

### 494-495-496 Cooperative Education/Internship/ Field Experience 1-12 FSSu

Planned and supervised professional experience related to Agric. Educ. which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

## Graduate Courses

### 505-605 Seminar 1-2(1,0) or (2,0) FSSu

Selected areas of Agricultural Education including special investigation, reports, and discussion.

### 506-606 Problems 1-3 FSSu

Directed reading and research in selected agricultural education topics.

### 706 Adult Ed in Ag 2(2,0) Su

### 707 Supervised Occupational Experiences & Student Groups in AgEd 2(2,0) Su

### 776 Curriculum in AgEd 2(2,0) Su

### 792 Research Problems in AgEd 2(2,0) FSSu

## Adult Higher Education (AHed)

### Undergraduate Courses

#### 496 Field Practice Training in Extension 2-5 credits

Available to a limited number of majors in agriculture or home economics interested in Extension work who have completed the junior year. Students will be assigned to a county during the summer for a period of time at the student's convenience.

## Graduate Courses

### 600 Special Problems in Extension 2-6 credits

Individually assigned investigative problems in Extension. Individual conference with Laboratory and/or field work. Arrangements with Extension staff must be made prior to registration.

### 510-610 Adult Teaching & Learning 3(3,0) Su

Emphasize teacher behavior in relation to adult learning. Social and cultural factors and their effects on learning process.

### 581-681 Workshop in Adult & Continuing Education 1-3 FSSu

Special areas in adult and continuing education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understandings in a current area.

### 582-682 Seminar 1-3 FSSu

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

### 589-689 Internship in Ed 1-6(0,6) FSSu

On-the-job participation in teaching or related fields in schools under the supervision of local school personnel and a staff member from the Division of Education.

### 591-691 Problems 1-3 FSSu

Directed reading and research in selected individual adult and continuing education topics.

### 711 Organization & Administration of Adult Ed 3(3,0) Su

### 751 Principles of College Teaching 3(3,0) S

### 792 Research Problems in Adult Ed 3(2,0) FSSu

## Counseling, Guidance and Personnel Services (CGPS)

Associate Professor Smith, supervisor

The Counseling, Guidance and Personnel Services major is designed to assist the student to develop personally and professionally so that the person can function more effectively in a helping relationship with others. The program emphasizes the development of the professional competencies expected of qualified counselors and staff members in schools, higher education, agencies and other institutions.

## Undergraduate Courses

### 243 Career Planning & Development 1(1,0) FSSu

Skills in career decision making. Potential career choice and employment information will be explored in relation to individual goals.

### 410 Prin of Guidance 2(4,0) FSSu

Developing basic human relations and helping skills; self-awareness and self-examination of the interpersonal communications process; emphasis on understanding self and understanding others.

## Graduate Courses

### 503-603 Elementary School Guidance 3(3,0) SSu

Examination of the counseling process with children. The implementation of developmental guidance programs to meet children's emotional and learning needs.

### 510-610 Foundations of Guidance 3(3,0) FSSu

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.

### 561-661 Theories of Counseling 3(3,0) FSSu

Theories, methods and application of the counseling process at all levels. An examination of how counseling philosophy is applicable to a variety of occupations and to daily living.

### 581-681 Workshop

Comprehensive exploration of special areas in an intensive time-frame. Designate to increase specific skills and understandings in a current topic area.

### 582-682 Seminar 1-3 FSSu

Study in selected areas of counseling and guidance including special investigation, reports and discussion.

### 590-690 Special Topics 1-3 cr. FSSu

Advanced courses taught upon demand covering such topics as crisis intervention, counseling special groups, cross cultural counseling, various counseling approaches, chemical dependency, etc.

### 713 Administration & Operation of Guidance & Personnel Services

3(3,0) FSu

### 736 Appraisal of the Individual 2(2,0) Su

742 Career Education & Occupational Information 3(3,0) FSu

### 766 Group Counseling 2(2,0) FSSu

### 787 Counseling Practicum 3-5 FSSu

### 788 Group Counseling Practicum 2-4 FSSu

### 789 Internship in Counseling, Guidance & Personnel Services 1-6 FSSu

### 791 Problems 1-3 FSSu

### 796 Research Problem in Counseling and Guidance 2(2,0) FSSu

## Driver Education (DrEd)

## Undergraduate Course

### 370 Driver Education 3(3,1) FSu

Basic course for driver education teachers in secondary schools. Techniques, materials, equipment and facilities. Organization, administration, public relations. Classroom instruction and road practice. P, EPsyc 302 and consent.

## Graduate Courses

### 550-650 Safety Education 3(3,0) FSSu

Philosophy, content and methods requisites to teachers participation in accident prevention activities and school safety education program.

### 570-670 Advanced Driver Ed 3(3,1) SSu

Traffic accident problems; survey of research studies in driver education and protection; sources of materials, measurement of driver attitudes. May be conducted as regular course or short course involving full two weeks (80 hours) of instruction. P, 370.

### 571-671 Driver Ed Simulation 2(2,0) Su

Philosophy, organization and procedures in the use of simulators to teach Driver Education.

### 572-672 Alcohol & Drugs in Relation to the Driving Task 2(2,0) Su

Alcohol and drugs in relation to the individual's ability to drive. Organization of course content and materials to be used in high school Driver Education.

## Educational Administration (EdAd)

A Graduate degree in Education is offered for students preparing to become school administrators. In order to qualify for a principal's administrative certificate, the individual must have completed a certain number of specified professional education courses, must have teaching experience, and must have completed a Master's degree.

## Graduate Courses

### 700 Public School Administration 3(3,0)

### 710 Organization & Administration of Elementary Ed 2(2,0)

### 711 Secondary School Administration 3(3,0)

### 715 Elementary & Secondary School Supervision 3(3,0)

### 730 School Finance 2,(2,0)

### 732 School Buildings & Grounds 2(2,0)

### 735 School Law 3(3,0)

### 781 Workshop 1-3

### 782 Seminar 1-3(1-3,0)

### 789 Internship in Ed 1-6(0,1-6)

### 791 Problems 1-3

### 792 Research Problems in Ed Administration 2(2,0)

## Education Evaluation and Research (EdER)

## Undergraduate Course

### 415 Ed Measurements 2(2,0) FS

Measurements and evaluation applied to achievement in secondary school subjects. Underlying principles and best practices. Functional in emphasizing best and newest in teacher-made tests and understanding and some usage of standardized tests. Interpretation of results. P, senior in education. Offered first part of semester.

## Graduate Courses

### 590-690 Special Topics 1-3 cr.

Advanced courses will be taught upon sufficient demand covering such topics as Least Restrictive Environment, computers in education observation techniques for classroom evaluation.

### 711 Group Testing 3(3,0)

761 Intro to Graduate Studies 3(3,0) FSSu

## Education Foundations (EdFn)

### Undergraduate Course

#### 339 Intro to Am Ed 2(2,0) FSSu

Historical, philosophical, psychological, and sociological backgrounds for education in America. Aims and functions of American education. Organization and administration on federal, state, and local levels in America. Teaching as a profession. An overview of education in American Society for classroom teachers. P, Psyc 101, junior standing.

#### 385 Computers in Teaching 2(2,0) FSSu

An overview of the application of computer technology in the classroom. Topics include computer literacy, educational software, microcomputer applications in special education, and an introduction to word processing and programming (BASIC).

## Graduate Courses

### 500-600 The Exceptional Child 3(3,0) FSu

Exceptionalities in children including the mentally retarded, gifted, emotionally disturbed, physically handicapped and speech impaired. Definitions, prevalence, identification, characteristics, and educational and counseling procedures and resources are identified.

### 505-605 Computers in the Classroom 2(2,0) FSSu

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 instructor permission.

### 510-610 BASIC Programming Applications in Education 3(3,0) FSSu

Examines the utilization of microcomputers and microcomputer software in the classroom; covers BASIC programming language which allows educators to effectively evaluate and modify software programs to meet the needs of teachers and students in the classroom. P, EPsy 302 r instructor permission.

### 520-620 Philosophy of Ed 2(2,0) FSu

Comparison of historic and current philosophies of education, their major emphasis and effects on educational goals and practices today.

### 525-625 Issues in Special/Multi-cultural Education 2

Deals with issues surrounding the diversity of populations, both within the schools and in our global society.

### 590-690 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.

## Elementary Education (EIEd)

### Undergraduate Courses

Mus 351 Music Ed I: Elementary Concepts (See Music Section)

## Graduate Courses

### 581-681 Workshop 1-3 FSSu

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

## Educational Psychology (EPsyc)

### 302 Ed Psychology 2(2,0) FSSu

Exploration into the world of the learner. Basic learning theories and use of these concepts in teaching. Focuses on disciplines, grouping, special needs, students, and multi-cultural concepts in educating and motivating students. Required for certification. P, junior standing, Psyc 101.

## Graduate Courses

### 508-608 Humanistic Approaches to Teacher Effectiveness 2(2,0) SSu

Skills in human relationships, developing potentials, resolving differences, active listening, developing congruency, using 'no lose' method of resolving classroom conflicts. Developing learner responsibility, accepting others.

### 523-623 Adolescent Psychology 3(3,0) SSu

Physical, social, emotional, intellectual and vocational aspects of adolescent development. Emphasis on increasing understanding of adolescents and their problems. P, 101 or 102.

### 530-630 Learning Disorders of Children 3(3,0) SSu

Examination of the nature, causation and assessment of learning difficulties in children. Designed to assist educators in mainstreaming students. Emphasis placed on diagnosing, remediating and designing Individual Education Plans in compliance with Public Law 94-142.

### 550-650 Gifted and Talented 3(3,0) SSu

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.

### 552-652 Enhancing Creativity 3

Explores the various dimensions of creativity, including what it is, how it develops, how to teach creative students, and how to evaluate creative works.

### 740 Advanced Ed Psychology 3(3,0) FSu

761 Practicum in Individual Testing 4(4,0)

## Secondary Education (SeEd)

### Undergraduate Courses

Students interested in teaching must fulfill the major department's requirements for teaching. Particular attention must be given to the special methods courses and other courses required of prospective teachers.

### 287 Practicum & Professional Lab 2(1,1) FSSu

Introduction to effective instructional procedures. Observation and work experience in elementary, junior high, and senior high schools.

### 391 Directed Studies in Selective Topics 1-9 FSSu

A student who is interested in studying a certain topic or acquiring a particular skill in which a faculty member is competent but which is not covered by regular courses at SDSU, may undertake a program of directed study. The work will be planned and implemented by the student and the instructor, with department head approval.

### 400 Methods of Teaching in Secondary Schools 3(3,1) FS

General methods used in teaching. Planning, designing and using specific strategies. Micro teaching and peer teaching used in providing students with opportunities to practice the methods learned. P, senior in education. Offered first part of semester.

### 405 Audio-Visual Methods & Materials 2(2,4) FS

Media used in instruction and communication. Emphasis on developing materials for use in the classroom. Small group laboratory sessions correlate with large group demonstration/lectures. You will also become familiar with the operation of audio-visual equipment. P, senior in Education. Offered first part of semester.

### 412 Methods of Teaching Social Studies 2(2,0) S

Designed for prospective teachers of Social Studies. Course will focus on theories, methods, processes, organization patterns, and materials used for teaching the social studies and the individual disciplines of Economics, Geography, History, Political Science, Psychology, and Sociology. Required for majors in all of the Social Sciences. Strongly recommended for Social Science minor.

### 416 Strategies in Science Teaching 2(2,0) F

Theories, methods, applications, and training common to all sciences and scientific behavior. Emphasis will be given to individual science majors who plan to teach in Biology, Chemistry, Physics, and General Science. Required of all science majors. Strongly recommended for Science minors.

### 450 Teaching of Reading 3(3,0) FSSu

Designed for secondary content teachers. Basic principles of reading and comprehension, and practical experience in relating principles to everyday demands of the content classroom. A special emphasis upon content instruction which meets the reading/comprehending abilities of individual students. Required for certification.

#### **488 Supervised Student Teaching in Secondary Schools 8(0,8) FS**

Assigned in student's teaching major, or, if appropriate, in teaching minor. Scheduled in last part of semester. Application for student teaching must be made in second semester of junior year on proper application form. Required for certification. (Students, including transfer students, who will be student teaching must have a GPA of 2.2)

#### **492 Problems in Ed 1-3**

Selected studies and activities to meet the needs of undergraduate students.

#### **493 Undergraduate Course Specials: (Topical) 1-5 FSSu**

Ten or more students who wish to study a topic in which a faculty member is competent but which is not covered by regular courses at SDSU may propose a Special. The duration, subject matter, amount of credit and mode of grading will be planned by the instructor and students, under the general supervision of the head of the department in whose discipline and under whose supervision the Special will be taught. If more than one department is involved, a committee composed of the various department heads and the dean will exercise these supervisory duties. In such cases the Special will be cross listed. The project will require the approval of the faculty of the department or departments affected.

#### **494-496 Internship & Field Experience: (Topical) 3-12 FSSu**

Students who have the opportunity become involved in an off-campus activity which promises to contribute significantly to their education, may enroll for and receive between 3 and 12 credits at a maximum rate of one credit per week. You must obtain permission to register for such credits from the department in whose discipline and under whose supervision the project would be carried out. The experience will be planned and method of evaluation and grading established by an instructor in consultation with you under the general supervision of the department head. The project will require approval of the departmental faculty. Grades may be based on either the A-F or E, F systems. Upon termination of the project, copies of the final examination, report or other evaluation will be placed in your cumulative file.

### **Courses in Subject Matter Areas:**

#### **Art (See Visual Arts Section)**

ArtE 415 Methods of Teaching Art in the Public Schools

#### **English (See English Section)**

Engl 308 The Teaching of English

#### **Foreign Language (See Foreign Language Section)**

FL 420 Foreign Language Teaching Methods

#### **Health, Physical Ed & Recreation (See HPER Section)**

PE 460 Methods of Teaching Physical Ed

#### **Home Economics (See Home Ec Section)**

HEd 331 Practicum in Occupational Teacher Education

HEd 411 Philosophy & Methods

HEd 412 Preparation for Student Teaching and Extension

#### **Practicum**

HEd 473 Supervised Student Teaching in Home Ec

#### **Health Science (See Health Sc Section)**

HSc 463 Methods and Materials in Health Ed.

#### **Music Education (See Music Section)**

Mus 260 Conducting Fundamentals

Mus 270 Pedagogy I (7 sections)

Mus 271 Pedagogy II (7 sections)

Mus 351 Music Ed I: Elementary Music Concepts

Mus 361 Music Ed II: Conducting

Mus 362 Music Ed III: Methods and Materials

Mus 365 Music Ed IV: Sup. & Admin. of School Music

Mus 370 Pedagogy III

Mus 371 Pedagogy IV

Mus 465 Music Ed V: Instrumental Techniques

#### **Science (See Biology Section)**

Bio 595/695 Strategies in Science Teaching

#### **Speech (See Speech Section)**

SpCm 375 Teaching of Speech

### **Graduate Courses**

#### **572-672 Motivation and Discipline 2 FSu**

Theories of motivation and discipline and application to the classroom. Stresses techniques for preventing discipline problems, and 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, guidance, and administrative personnel.

#### **581-681 Workshop 1-3 Su**

Special areas in education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understandings in a current educational area.

#### **582-682 Seminar 1-3(1-3,0)**

Selected areas of education including special investigation, reports and discussion.

#### **590-690 Special Topics 1-3 cr.**

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.

#### **591-691 Problems 1-3**

Directed reading and research in selected individual education topics.

#### **740 Secondary School Curriculum 2(2,0)**

#### **745 Updating Teaching Strategies 2(2,0)**

#### **752 Foundations of Reading 2(2,0) SSu**

#### **753 Diagnosis & Remediation of Reading Problems 2(2,0) Su**

#### **754 Clinical Practice in Reading 2(1,4) Su**

#### **789 Internship in Ed 1-6(0,6) FSSu**

#### **792 Research Problems in Ed 2(2,0)**

### **Vocational Teacher Training Education (VTTE)**

#### **Undergraduate Courses**

#### **405 Prin of Voc Ed & Practical Arts 2(2,0) FS**

Overview of vocational-technical and practical arts education, its place in the community school; organization and characteristics of instructional programs at secondary, post-secondary and adult levels in agriculture, home economics, business and office, industrial, health, and distributive education; career education; legislation; and current trends and issues. For prospective teachers and guidance personnel. P, junior in Education.

#### **Graduate Courses**

#### **525-625 Development of Voc Ed Thought & Practice 3(3,0) FSSu**

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. P, senior in Education.

#### **731 Administration & Supervision of Voc Ed 3(3,0) Su**

### **Electrical Engineering (EE)**

#### **College of Engineering**

Professors Ellerbruch, head; Finch, Knabach, Sander; Professors Emeritus Dracy, Manning, Storry; Associate Professors Miron, Petersen; Associate Professor Emeritus Bruce; Instructors A. Andrawis, M. Andrawis, Helder, Kornbaum

Realizing that each person is an individual, the degree program is arranged to include 31 credits of elective courses. This elective flexibility allows you to pick a technical and non-technical course program that best suits your abilities, needs and interests.

The university offers you the opportunity to obtain a broad, practical education through interaction and cooperation with students and faculty from all other colleges on the campus. Cooperative projects by students and faculty among all colleges on campus are encouraged.

#### **Academic and Graduation Requirements**

Students will be accepted into the Electrical Engineering sophomore level courses only after they have completed the following freshman courses with a "C" average or better in these courses: Math 123, 224; Chem 112, 114; EG 121; Phys 211; CSc 114; GE 110 (satisfactory grade). Students will be admitted into junior level

EE courses and into the major only after they have completed EE 215 and EE 216 with a minimum grade of "C", and they must have completed the following sophomore courses with a "C" average or better in these courses: EE 265, 217; EM 223; Math 225, 321; Phys 213; CSc 271.

Students will not be permitted to enroll in subsequent courses for which either EE 215 or EE 216 is a prerequisite until the above requirement has been met. A graduation ratio of 2.0 or better is required for all Electrical Engineering courses taken.

### Curriculum in Electrical Engineering

For the degree, Bachelor of Science (Accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology)

The non-technical (17 credits), technical (14 credits), and required (105 credits) comprises the 136 credit degree. You have flexibility in choosing when elective courses are taken.

Humanistic and social science non-technical electives must be chosen to satisfy the University Core, and the more rigorous EAC/ABET requirements. Six humanities credits from at least two areas and 9 social sciences credits from at least two areas must be taken for graduation. An additional two credits must be taken for a total of 17. The Electrical Engineering department office will provide you with an approved list of courses.

Approved technical electives fall into three general categories:

1. All Electrical Engineering courses beyond those required.
2. 300 level and above courses taught by the departments of Chemistry, Computer Science, Mathematics, Mechanical Engineering and Physics.
3. Courses in support of a coherent technical program.

At least 9 credits of the technical electives must be selected from Electrical Engineering courses.

Freshman Year	F	S
Mathematical Analysis I-II, Math 123-224.....	5	4
Gen Chem, Chem 112 and 114.....	4	3
English or Speech, Fr Comp Engl 101 or SpCm 101.....	3	3
Engineering Design Graphics I, EG 121.....	2	
PASCAL Programming, CSc 114.....		3
Gen Physics I, Phys 211.....		4
Fitness & Lifetime Activities, PE 100.....	1	1
Engineering Orientation, GE 110.....	0	
Electives.....	x	x

Sophomore Year	F	S
Electric Circuits I-II, EE 215-216.....	3	3
Electric Materials I, EE 265.....		2
Electrical Instruments & Measurements, EE 217.....		1
Engineering Mechanics, EM 223.....		3
Mathematical Analysis III, Math 225.....	3	
Differential Equations, Math 321.....		3
General Physics II, Phys 213.....	4	
Computer Programming, CSc 271.....	3	
Electives.....	x	x

Junior Year	F	S
Electronics I-II, Elec 320-321.....	3	3
Electronics Laboratory I-II, Elec 322-323.....	1	1
Electromagnetic Field Theory I, EE 385.....		3
Digital Systems, EE 345.....		3
Electrical Materials II, EE 365.....		2
Signal and System Analysis, EE 316.....	3	
Probabilistic Methods in EE, EE 310.....		3
Advanced Engineering Math, Math 331.....	3	
Atomic Physics, Phys 331.....	3	
Technical Communications, Engl 303.....	3	
Electives.....	x	x

Senior Year	F	S
Linear Control Systems, EE 415.....		3
Electromagnetic Field Theory II, EE 485.....	3	
Energy Conversion I, EE 430.....	4	
Energy Lab, EE 434.....	1	
Engineering Economy, GE 422.....		2
Thermodynamics, ME 314 or Thermodynamics and Stat. Mech., Phys 341.....		3
Electives.....	x	x

You should select technical electives to complement employment goals. Following are some suggested areas and supporting courses.

### Elective Areas of Study

**Communications & Advanced Electronics (Credits);**  
Communication Engineering, EE 470 (3); Communication Systems, EE 570 (3); Electronics III, EE 420 (4); Mathematical Statistics, Math 381 (4); Microprocessor System Design, EE 447 (3).

**Computers-Data Processing Systems (Credits);**  
Microprocessor System Design, EE 447 (3); Electronics III, EE 420 (4); Numerical Analysis, Math 571 (3); Computer Operation, CSc 314 (3).

**Bioengineering (Credits);**  
Biomedical Electronics, EE 550 (2); Biomedical Systems Analysis, EE 552 (2); Anatomy, Zool 221 (3); Microprocessor System Design, EE 447 (3); Mammalian Physiology, Zool 325 (4).

**Electronic Materials (Credits);**  
Special Topics in Microelectronics, EE 593 (1-3); Integrated Circuit Engineering, EE 520 (3); Elementary Physical Chemistry, Chem 340 (3); Physical Chemistry, Chem 344 (3); Physics of the Solid State, Phys 439 (3); Science of Solids, Phys 537 (3).

**Power Systems (Credits);**  
Power System Analysis, EE 431 (3); Advanced Power Systems, EE 432 (3); Seminar in Power Systems, EE 435 (1); Symmetrical Components, EE 532 (2); Power System Stability, EE 530 (2); Computer Analysis of Power Systems, EE 531 (3); Mathematical Statistics, Math 381 (4); Industrial Engineering, ME 362 (3).

**Cooperative Education Program.**  
There is the opportunity to work in industry and take EE 494 which is a cooperative education course.

## Electrical Engineering (EE)

### Undergraduate Courses

- 120 Electronics for Everyone 2(2,0)**  
Electronic devices, instruments and systems are considered. Sophisticated systems such as computer and consumer electronics are studied. A student will become more aware and knowledgeable of the electronic environment and potentials for quality living. P, Algebra.
- 211 Intro to Electrical Engineering 1(0,2)**  
Concepts common in engineering and techniques of design.
- 215 Electric Circuits I 3(3,0)**  
Ohm's law, Kirchhoff's laws, mesh and nodal equations, source transformations, superposition, RLC circuits. P, credit or concurrent registration in Math 225; Phys 213.
- 216 Electric Circuits II 3(3,0)**  
Sinusoidal analysis including the sinusoidal forcing function, phasor concepts, sinusoidal steady-state response, average power, root-mean-square value, and polyphase power; complex frequency and frequency response; two-port networks. P, EE 215 (with C or better).
- 217 Electrical Instruments & Measurements 1(1,3)**  
Measurement theory, electrical instruments, measurement errors, treatment of data. P, EE 215 (with C or better).
- 265 Electrical Materials I 2(2,0)**  
Structure of metals, polymers and ceramics — their properties and applications. P, Chem 114.
- 305-306 Basic Electrical Engineering I & II 3(2,2) & 5(4,3)**  
Laws of electric and magnetic fields and circuits, measurements of electric and magnetic properties, electric circuit analysis. Resonance and coupled circuits. Characteristics of equipment used in applying electric power to mechanical drive. For non-electrical students. P, Math 225; Phys 213.

**310 Probabilistic Methods in Electrical Engineering 3(3,0)**

Basic probability and random variables. Applications to system reliability and effect of tolerances on circuit design. Classification of random processes, correlation functions and spectral density of random processes. Response of linear systems to random inputs. Detection of signals in noise. P, EE 216 (with C or better).

**316 Signal and System Analysis 3(3,0)**

Description of deterministic signals through the use of Fourier Series, Fourier and Z-Transforms. Systems description treated by differential and difference equations including transform methods. Computation of system response to both continuous and discrete inputs. P, EE 216 (with C or better).

**320 Electronics I 3(3,0)**

Analysis of electronic devices and circuits. Introduction to electronic circuit design. Computer Aided Design (CAD) included. P, EE 216 (with C or better).

**321 Electronics II 3(3,0)**

Design and analysis concepts for linear and digital electronic circuits. Emphasis on integrated circuit design. P, EE 320.

**322 Electronics Lab I 1(0,3)**

Experimental design of basic electronic circuits. P, EE 217, concurrent with EE 320.

**323 Electronics Lab II 1(0,3)**

Experimental design and analysis of electronic circuits. Analog and Digital-discrete and integrated circuits are designed and tested. P, concurrent with EE 321.

**330 Fundamentals of Lighting 3(3,0)**

Light sources, fixtures, lighting calculations, decorative lighting, lighting for special effects, home lighting and special problems. P, consent.

**365 Electrical Materials II 2(2,0)**

Semiconductor and junction theory, semiconductor devices. P, Phys 331.

**385 Electromagnetic Field Theory I 3(3,0)**

Beginning with the experimental results of Coulomb, Ampere, and Faraday, classical field theory is developed. Forces, potentials, energy storage and dissipation are all treated for static fields. Then Faraday's induction law and Maxwell's displacement current are introduced, culminating in the complete description of the time-varying fields, given by Maxwell's equations. P, EE 215 (with C or better); concurrent with Math 331.

**415 Linear Control Systems 3(3,0)**

Feedback control systems by operational methods. Stability criteria and compensation design. State variables, sampled data systems. P, Math 331, concurrent with EE 316.

**416 Control Systems Lab 1(0,3)**

Control system components and systems are designed. Concurrent with EE 415.

**420 Electronics III 4(3,3)**

Integrated circuits for switching circuits, digital logic; bistable, astable and monostable multivibrators; voltage comparators with applications and solid state memories. P, EE 321, EE 323.

**430 Energy Conversion 4(4,0)**

Basic engineering laws and concepts in analysis of energy-conversion and energy transfer systems and devices. Includes AC and DC machines and analysis of response of machines to operating conditions. P, EE 385.

**431 Power System Analysis 3(3,0)**

Basic parameters of transmission lines. Representation of power systems, network equations and solutions, load-flow studies and load-flow control, and symmetrical faults on synchronous machines. P, EE 430, or consent.

**432 Advanced Power System Analysis 3(3,0)**

Symmetrical components, protective devices, economic generation, and stability analysis of power systems. P, EE 431 or consent.

**433 Power Systems Protection 3(3,0)**

Relay types, characteristics, and applications. Fuse coordination. Special instrumentation such as polyphase, reactive, demand and telemetering. Philosophy of relaying. P, EE 430, EE 432 or consent.

**434 Energy Laboratory 1(0,3)**

Experimental work with energy transfer and energy conversion devices. Concurrent with EE 430.

**435 Seminar in Power Systems 1(1,0)**

Guest speakers, field trips, panel discussions and selected films on pertinent electric power and energy topics.

**447 Microprocessor System Design 3(2,3) or 3(3,0)**

Hardware concepts, organization and design of microcomputer systems. Principles of microcomputer programming and operation using assembly language and PASCAL. Laboratory experience with a microcomputer. P, EE 345 or consent of instructor.

**449 Computer Architecture & Organization 3(3,0)**

Computer organization, operating principles and design considerations from a software or programming point of view. Assembly language programming is used to reinforce the study. P, FORTRAN and Assembly language programming and consent.

**470 Communication Engineering 3(3,0)**

Modulation and detection methods including circuit analysis and design for digital and analog communication systems are presented. P, EE 316; EE 320.

**485 Electromagnetic Field Theory II 3(3,0)**

Selected topics in application of dynamic field theory. Generation and propagation of waves. P, EE 385.

**487 Microwave & Radar Systems 2(2,0)**

Radar and microwave system theory and operation.

**490 Seminar in Electrical Engineering 1-3****492 Special Electrical Problems 1-3**

Problems in EE of mutual interest to students and faculty. P, consent.

**493 Special Topics in EE 1-3**

Current topics in microwaves, fields, systems and other selected areas.

**494-495-496 Cooperative Education/Internship/Field Experience 1-6 FSSu**

Planned and supervised professional experience related to electrical engineering which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator. Inspection Trip to industrial sites in S.D. or to a city out of state such as Minneapolis. P, Senior standing.

## Graduate Courses

**510-610 Passive and Active Filters 3(3,0) or 3(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.

**515-615 Linear Network Theory 3(3,0)**

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.

**516-616 Nonlinear Analysis 2(2,0)**

Numerical, graphical and analytical methods of analysis. Singularities; systems with varying coefficients, stability of nonlinear systems, describing function methods. P, consent.

**520-620 Integrated Circuit Engineering 3(3,0)**

Analysis and design of modern integrated circuits. New devices and design concepts. P, EE 321 or equivalent.

**530-630 Power System Stability 3(3,0)**

Inertia constant, swing-curves, equal area criterion, as applied to transient stability studies. P, EE 430 or consent.

**531-631 Computer Analysis of Power Systems 3(3,0)**

Concepts used in formulating load flow and fault study problems for computer solution. P, EE 430; EE 432 or consent.

**532-632 Symmetrical Components 2(2,0)**

Application of symmetrical components to simple three phase circuit, unloaded systems, loaded systems. Symmetrical component impedances. P, EE 430; EE 432 or consent.

**533-633 Alternate Energy Conversions 2(2,0)**

Basic principles and design equations of thermoelectric and thermionic devices, magnetohydrodynamic converters, solar cells, and fuel cells. P, EE 430; ME 314, or consent.

**547-647 Advanced Microprocessor System Design 3(3,0)**

Details of microcomputer hardware design, DMA, multiprocessing, memory management and testing strategies. Advanced microprocessor architectures. P, EE 345; EE 447.

**550-650 Biomedical Electronics 2(2,0)**

Design and operation of basic biomedical electronic instrumentation. Measurement and continuous monitoring of physiological variables: ECG, body temperature, blood pressure, etc. Data Acquisition, telemetry data and reduction techniques. P, EE 321 or consent.

**552-652 Biomedical Systems Analysis 3(3,0)**

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.

**554-654 Biomedical Instrumentation & Safety for Health Facilities**  
3(3,0)

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 430, EE 321.

**570-670 Communication Systems** 3(3,0)

Statistical methods, random signals and noise, physical sources of noise, statistical communication theory and digital communications. P, EE 470 or consent.

**585-685 Microwave Theory** 3(3,0)

Transmission lines, resonant cavities, waveguide junctions, and components. Active devices, lasers, masers. P, EE 386.

**587-687 Electromagnetic Radiating Systems** 3(3,0)

Electromagnetic waves; ground wave propagation; sky wave propagation. Advanced antenna theory. P, EE 485.

**593-693 Special Topics in Electrical Engineering** 1-3

P, consent.

**690 Special Electrical Problems** 1-3

P, consent.

**790 Thesis in Electrical Engineering**

## Electronics Engineering Technology (ET)

(See General Engineering)

## Engineering Graphics (EG)

(See General Engineering)

## Engineering Mechanics (EM)

(See General Engineering)

## Engineering Shops (ES)

(See General Engineering)

## English (Engl)

### College of Arts and Science

Professor Alexander, head; Professors Evans, Foreman, Marken, West, Woodard, Williams, Witherington, Yarbrough; Professor Emeritus Brown, Walz; Associate Professors Brandt, Duggan, Kildahl, Taylor, Veglahn; Associate Professor Emeritus Nagle; Assistant Professors, Haug

The English Department offers instruction in clear thinking and expression, in the development and use of language, in literature of the western world, especially Britain and America, in literary criticism, and in technical writing. An English major prepares students for teaching careers, for writing and editorial work, for professional schools of law, business, theology, library science, and social work, and for any endeavor in which facility in the use of language is essential.

#### Undergraduate Major Requirements

Students majoring in English and meeting requirements qualify for the Bachelor of Arts degree. By taking the required courses in education, they can satisfy the requirements for certification as secondary teachers. English majors have wide choice within the major areas of literature. The major requires 36 hours in English: 15 hours in English Literature: English 321-322; 3 hours from English

223, 224, 226, 331, 333, 433; 3 hours from English 332, 425, and 439; 3 hours of electives in English Literature, 9 hours in American Literature including 3 hours from Engl. 341, 351, 357, 453, 454; Linguistics 425 or 543; English 303 or 383; 6-9 hours of electives. English 101 and English 300 do not count in the 36 hours major requirement. Those who plan to teach must also take English 308. Prospective teachers of English must maintain a grade-point average of at least 2.6 in all English courses.

English majors not planning high school certification must meet the requirements listed in the preceding paragraph, excepting English 308. English majors also must take either History 121 and 122 or Philosophy 312.

#### Undergraduate Minor Requirements

The English minor consists of 9 hours of English literature, 6 hours of American literature, one course in advanced composition (303 or 383) or linguistics; and additional English electives to total twenty hours. Freshman Composition and Junior Composition are not counted toward the minor. Each student desiring to complete a minor in English should consult the Head of the Department of English not later than the beginning of his junior year.

Note: Because the high school English teacher is frequently assigned such responsibilities as directing a play, and other speech activities or sponsoring the school paper or yearbook, the English major who plans to teach is encouraged to take courses in theater, oral interpretation or the supervision of school publications.

Students may exempt some composition requirements by taking the college level examination (CLEP) and achieving a passing score.

#### Graduate Study

The Department offers the Master of Arts in English. For details consult the Graduate Catalog.

#### Curriculum in Arts and Science, English Major Leading to the Bachelor of Arts degree for teaching

Freshman Year	F	S
Fr Comp, Engl 101.....		3
Foreign Language.....	4	4
History 121, 122.....	3	3
Natural Science.....	4	4
Fund of Speech, SpCm 101.....	3	
Fitness & Lifetime Activities, PE 100.....	1	1
Elective.....		2

Sophomore Year	F	S
English or Am Lit Courses.....	3	3
Foreign Language.....	3	3
Math.....	3	
Indians of North America, Anth. 421 or History of Am. Indians, Hist 368.....		3
*Gen Psychology, Psyc 101.....	3	
*Practicum & Professional Lab Experiences, SeEd 287.....		2
Elective.....	4	5

Junior Year	F	S
Junior Comp, Engl 300.....	3	
English or Am Lit Courses.....	6	6
Creative Writing, Engl 383 or Tech. Comm. Engl 303.....		2-3
Structure of English, Ling 425 or 543.....		2
*Teaching of Comp, Engl 308.....		3
*Intro to Am Ed, EdFn 339.....	2	
*Ed Psychology, EPsyc 302.....	2	
Elective.....	3	2

Senior Year	F	S
English or Am Lit Course.....	9-12	
*Ed Measurements, EdER 415.....		2
*Methods of Teaching in Secondary Schools, SeEd 400.....		3

*Prin of Guidance, CGPS 410.....	2
*Audio-Visual Methods & Materials, SeEd 405	2
*Supervised Teaching in Secondary Schools, SeEd 488.....	8
Electives.....	3-5

\*Required of all students preparing to teach in public schools; others may substitute courses appropriate to their purposes and interests. In the senior year, the semesters may be reversed in order. Students who wish to teach in high school should consult the Dean of Division of Education before registering for the first semester of their junior year.

Courses in the English Department are divided into two areas, English (Engl) and Linguistics (Ling).

## English (Engl)

### Undergraduate Courses

- 003 English as a Second Language 3(0,0) FS**  
Basic pronunciation, conversation, oral comprehension, and grammar. Conversation, oral and written comprehension, vocabulary and idioms, grammar, and beginning composition. For entering international students.
- 013 Complex Grammar Patterns and Advanced Composition 3(3,0) FS**  
More complex structural patterns and advanced composition. May be required before enrollment in English 101.
- 023 Written and Spoken Comprehension 3(3,0) FS**  
May be required before enrollment in English 101.
- 101 Freshman Composition 3(3,0) FSSu**  
Training in efficient, accurate reading and in clear, effective writing. Instruction in standard English grammar, usage, and punctuation in connection with writing.
- 213 World Literature Through the Renaissance 3(3,0) F**  
Literary masterpieces of the western world in English translation.
- 215 Modern World Literature 3**  
Masterpieces of World Literature (in translation) from the Renaissance to the present. Offered alternate semesters.
- 218 Introduction to Literature 3(3,0) FSSu**  
Principal literary types — fiction, drama, and poetry — to acquaint students with critical sense of aesthetic form.
- 223 Old & Middle English Literature 3(3,0)**  
Emphasizing pre-Norman heroic and Christian literature, the work of Chaucer and his contemporaries, and folk literature such as the ballads.
- 224 Poetry and Prose of the English Renaissance 3(3,0) (Alt. years)**  
Major writers (excluding Shakespeare) of the sixteenth and early seventeenth centuries. Emphasis on the works of Milton.
- 226 Drama of the English Renaissance 3(3,0) (Alt. years)**  
Major dramatists of the 16th and early 17th centuries, excluding Shakespeare.
- 252 Biography 2 S (Alternate years)**  
Studies in biography and autobiography as literature.
- 256 Literature of the American West 3(3,0) FS**  
Attention given to various attitudes toward the West expressed in literature.
- 263 Poetry 2(2,0) FS**  
Selected poems, British and American.
- 265 Fiction 3(3,0) FS**  
Narrative prose: short story, novelette, and novel.
- 267 Drama 3(3,0)**  
Selected plays from classical times to the mid-nineteenth century.
- 300 Junior Composition 3(3,0) FSSu**  
Advanced course in clear, effective prose reading and writing. P, 101 and junior standing.
- 303 Technical Communications 3(3,0) FSSu**  
Study of and practice in writing of a technical nature; expository writing will be stressed. P, 6 hours of composition (Except for Engineering Students).
- 305 Advanced Technical Communications 3(3,0) FS**  
Study of the technical communications styles and forms of the student's academic area. P, 303.
- 307 Writing in the Sciences 2(2,0)**  
The writing and discussion of scientific descriptions. Primarily designed for those taking courses in the sciences. Assignments include: descriptions of processes, writing of instructions, of definitions, abstracts, adjusting of writing style according to audience.
- 308 Teaching of Composition and Grammar 3(3,0) S**  
Techniques, materials, and resources for teaching English language and literature to high school students. Required of majors planning to teach in the secondary schools.

- 309 Teaching of Literature 3(3,0) F**  
Techniques, materials, and resources for teaching literature to high schools.
- 310 Mythology & Literature 3(3,0) (Alt. years)**  
Mythological backgrounds of literature and the ways literature itself contributes to the various mythologies that underlie our culture and shape the assumptions governing our values and behavior.
- 311 Literature of the Bible 3(3,0) (Alt. years)**  
Structural analysis of Old and New Testament texts which are literary in form (i.e. lyric, dramatic, epic, and narrative) for their aesthetic and ethical meanings. Comparison and relation of Hebraic form to modern symbolic modes.
- 321-322 English Literature 3(3,0) FS**  
English literature survey from Beowulf to modern times.
- 331 Eighteenth-Century English Literature 3(3,0) (Alt. years)**  
Literature of the English Augustan age, (1660-1800) particularly Swift, Dryden, Pope, Johnson.
- 322 The Early 19th Century 3(3,0) (Alt. years)**  
Non-dramatic literature of the first half of the nineteenth century in England, particularly the poetry of Wordsworth, Blake, Coleridge, Byron, Shelley, Keats.
- 333 Early English Novel 3 (Alt. years)**  
Studies in the English novel from its beginnings through the 17th and 18th centuries.
- 341-342 American Literature 3(3,0) FS**  
From its beginning to the present.
- 350 Science Fiction 3(3,0) F**  
A survey of short stories and novels from the Golden Age of Pulp Fiction, social satire of the 1950's, the New Wave of the 1960's and the speculative tabulation of the 1970's. Authors included are Heinlein, Asimov, Bradbury, Vonnegut, and Ellison.
- 351 American Indian Literature of the Past 3(3,0) F**  
Concentrating on myths and legends of major language groups, particularly the Siouan.
- 352 American Indian Literature of the Present 3(3,0) S**  
After defeat of the tribes, concentrating on autobiography, fiction, and poetry by Indian authors.
- 357 19th Century American Poetry 2(2,0) (Alt. years)**  
Development of American poetry from Bryant to Crane and to the early work of E.A. Robinson with emphasis upon form and idea.
- 358 20th Century American Poetry 2(2,0) (Alt. years)**  
Development of American poetry in the 20th Century from Frost and the later work of Robinson to present.
- 367 American Short Story 3(3,0) (Alt. years)**  
Development of American short story, emphasis on form from beginnings with Irving to present.
- 383 Creative Writing 2(2,0)**  
Writing of fiction, drama, biography, or poetry. P, 12 hours of English Junior Composition, or consent.
- 393 Undergraduate Course Specials 1(1-5)**
- 491 Directed Studies Program 1(1-9)**
- 425 The Late 19th Century 3(3,0) (Alt. years)**  
English literature of the last half of the 19th century, particularly novels (Dickens, Eliot, Hardy, Conrad) and poetry (Tennyson, Browning, Arnold).
- 433 Shakespeare 3(3,0) (Alt. years)**  
Representative comedies, tragedies, and histories of Shakespeare.
- 439 Twentieth-Century British Literature 3(3,0) (Alt. years)**  
British literature since 1900.
- 453 Hawthorne & Melville 3(3,0) (Alt. years)**  
Major works of the two great novelists of the American Renaissance.
- 454 Twain & James 3(3,0) (Alt. years)**  
The two contrasting lines of development in American Literature of the late nineteenth century as represented in the work of Mark Twain and Henry James.
- 459 Recent American Literature 3(2,0) (Alt. years)**  
Intensive study of a selected phase or type of American literature, specifically concentrated on recent trends in fiction and poetry.
- 463 Modern Drama 3(2,0) (Alt. years)**  
Beginning with Ibsen, but concerned chiefly with significant dramatists since his time.
- The following alternatives and options may be taken only after consultation with the Head of the English Department.**  
(See descriptions of these in the Introductory Section to the College of Arts and Science.)
- 490 College Honors Project 1(1-6)**
- 494-495-496 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu**
- 498 College Honors Seminar 1(1-6)**



## Graduate Courses

NOTE: Junior or senior standing and 16 hours of English are pre-requisite to all courses, numbered 500-600 to 590-690 inclusive.

### 506-606 Workshop in English & Speech

Sessions in linguistics, composition, or literature. A concentrated course; may not be taken concurrently with any other course. P, teaching experience or consent.

### 519-619 Comparative Novel 3(3,0)

Selected European novels from Fielding to Camus.

### 525-625 Victorian Literature 3(3,0)

Chief writers of British poetry and prose from 1840 to 1900, with emphasis on aesthetic and intellectual developments.

### 530-630 The English Romantic Movement 3(3,0)

Chief writers of English Romantic poetry and prose from 1789 to 1832, with emphasis on intellectual trends.

### 534-634 Advanced Shakespeare 3(3,0)

Selected plays of Shakespeare and significant Shakespearean criticism.

### 535-635 Chaucer (3,0)

Major works of Chaucer, with some attention to his sources and his language.

### 547-647 Pre-Civil War American Writers 3(3,0)

A selection of writers from American transcendentalism and Romanticism.

### 548-648 The American Realists & Naturalists 3(3,0)

From Melville through the realistic and naturalistic writers at the end of the 19th century.

### 550-650 Modern American Novel 3(3,0)

Selected American novelists after 1920 and through the post WW II novel, particularly emphasizing twentieth century themes and forms in the novel.

### 565-665 Contemporary Drama 3(3,0)

Representative British and American plays from the time of Shaw to the present; some attention may be given to significant Continental plays of this era.

### 597-697 Special Studies in Composition & Literature 1-3(1-3,0)

Special studies in various areas of writing, grammar, and literature. May be repeated to total 6 credits. Given only with the permission of the Chairman of the Department.

### 706 Research Tools in the Humanities 3(3,0)

### 720 Studies in Early English Literature 2-3(2-3,0)

### 723 Studies in Restoration and Eighteenth-Century Literature 2-3(2-3,0)

### 726 Studies in the 17th Century Literature 2-3(2-3,0)

### 727 Studies in Elizabethan Literature 2-3(2-3,0)

### 784 Literary Criticism 3(3,0)

### 792 Seminar in American Indian Literature 2-3(2-3,0)

### 793 Seminar in English Literature 2-3(2-3,0)

### 794 Seminar in American Literature 3(3,0)

### 758 Modern American Thought 3(3,0)

### 790 Thesis

## Linguistics (Ling)

## Undergraduate Courses

### 425 The Structure of English 3(3,0) S

Use of traditional, structural, and transformational grammars for describing the English language. Practical application in teaching. Strongly recommended for majors planning to teach.

## Graduate Courses

### 520-620 The New English 3(3,0)

Theory of transformational grammar and its approach to phonology, grammar, and semantics. Transformational grammar applied to language acquisition, English teaching, and second language teaching. Brief attention to stratificational grammar.

### 543-643 Development of the English Language 3(3,0)

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

## Entomology (Ent)

(See Plant Science)

## European Studies Program (EurS)

Gordon Tolle, Political Science, Coordinator; Philip Baker, Foreign Languages; Rodney Bell, History; David Crain, History; Norman Gambill, Visual Arts; Donna Hess, Rural Sociology; Karen Kildahl, English; Charles Lingren, Education; Ruth Redhead, Foreign Languages; Harriet Swedlund, Textiles.

The European Studies Program is an area study that combines the insights of many disciplines as they are focused on Europe. These areas include language and literature, history, art, philosophy, music, sociology, economics, political science, geography, health science, professional education, family studies, and organizational studies. The topics for the two core courses, Topics in European Culture and Topics in European Society, will vary. Both courses will deal with comparative and interdisciplinary topics, which will usually be taught by more than one instructor.

Why European Studies? It broadens one's horizon. Studying other cultures contributes to this liberating education. European studies is important because we live in an interdependent world; politically, economically, and culturally we have important ties with Europe. Many Americans trace their heritage to European roots. An improved understanding of that heritage, therefore, acts to give us a better understanding of our own society.

The benefits of this program are as follows: **Careers:** The European Studies Program will better prepare students for jobs in trade and commerce with Europe, tourism, primary and secondary school teaching, work for multinational firms, and work in various international agencies. **Cultural Understanding:** European Studies provides an opportunity to develop a greater understanding of European cultures which have had a great influence on American culture and on the entire world. **Social Awareness:** By examining the social institutions and policies of other "developed" or "first world" countries, European Studies provides an opportunity to develop a greater appreciation of international interdependence as well as greater insight into alternative social arrangements.

To enroll in this program you should contact the coordinator Dr. Gordon Tolle, Political Science, Tel. 688-4311. Upon graduation and completion of the program, a notation will be entered on your transcript.

The European Studies Program is an interdisciplinary program, requiring the student to take courses in both the humanities and social sciences. Almost all of these courses are also eligible to satisfy university core requirements (e.g., French 101 would fulfill part of a language requirement, and Political Science 265 would fulfill part of the social science requirement). As a result, you might complete the program without adding credits beyond the university core.

At least 21 of the 29 credit hours must be from outside your major department.

While it is not a requirement, living and studying in Europe may also be used to earn some credits.

### Curriculum in European Studies Program

(Total of 29 hours. Because courses used to satisfy the university core and 8 hours from your major department may be counted, the total number of **additional** credits may vary.)

Requirements	Credits
Language: one year of <b>study</b> in a European language or demonstrated competency at the second year level.....	6-8
History: History 122 Western Civilization (or History 327 Early Modern Europe or History 330 Topics in European History)....	3
Political Science: PoS 341 European Democratic Governments ...	3
.....	3

EurS 300 Topics in European Culture.....	3
EurS 301 Topics in European Society .....	3
Electives: additional credits to total 29 credits, chosen from an approved list.* At least one course must be from "Area A" (social science) and at least one course must be from "Area B" (humanities and arts).....	9-11

## Undergraduate Courses

### 300 Topics in European Culture 3(3,0)

Topics in European culture as expressed in literature, art, music, philosophy, and religion. The topic may be limited to a theme, for example Death, War, or Justice, or to a period in history, for example, Women in the Renaissance, Love in the Seventeenth Century, or Solitude in the Romantic Period. (May be repeated for credit when the topic is different.)

### 301 Topics in European Society 3(3,0)

An interdisciplinary examination of a topic in European social life. Examples include, among others, Ethnicity and Nationality, Aging, Revolution, European Unification, Political Parties and Economic Development, or Migrant Workers. (May be repeated for credit when the topic is different.)

### \*Approved list of electives

#### Area A. Social Science

- Econ 405 Compar Econ Systems
- Econ 540 Econ of Intl Sector
- Hist 326 Renaissance & Reformation
- Hist 327 Early Modern Europe
- Hist 330 Topics in Eur Hist
- Hist 342 English History
- Hist 345 History of Russia
- Hist 421-422 Contemporary European History
- Hist 447 Modern Germany
- Hist 538 Eur Intellectual Hist
- Hist 541 Europe in 19th Cent
- Geog 314 Geog of U.S.S.R.
- Geog 315 Geog of Europe
- Geog 520 Adv Regional Studies in Geog (when dealing with Europe)
- PolS 265 Political Ideologies
- PolS 343 The U.S.S.R.
- PolS 356 Int'l Law & Organization
- PolS 462 Modern Political Theory
- Soc 100 Intro to Sociology (cross cultural only)
- Soc 515 Social Thought
- Anth 320 Cultural Anthropology
- EurS 301 Society (when repeated)

#### Area B. Humanities

- Fren 101-102 Intro to Lang & Cult
- Fren 201-202 Language & Culture
- Fren 311-312 Comp & Conversation
- Fren 353 Theatre et Nouvelles
- Fren 354 Poesie et Romans
- Fren 411-412 Adv Comp & Con
- Fren 433-434 French Civilization
- Fren 473 Le Grand Siecle
- Fren 475 18e Siecle
- Fren 477 Romantisme au Symbolisme
- Fren 479 Le Vingieme Siecle
- Fren 490 Dir Study in French
- Germ 101-102 1st Year German
- Germ 201-202 2nd Year German
- Germ 311-312 Comp & Conversation
- Germ 321 Scientific German
- Germ 353-354 German Lit
- Germ 411-412 Adv Comp & Con
- Germ 433-434 German Civilization
- Germ 470 Rationalism, etc.
- Germ 471 German Clasicism
- Germ 473 German Romanticism
- Germ 475 19th Century Lit

- Germ 476 Novelle
- Germ 479 20th Century Lit
- Germ 490 Directed Study
- Span 202-203 1st Year Spanish
- Span 201-202 2nd Year Spanish
- Span 311-312 Comp & Conversation
- Span 353-354 Spanish Lit
- Span 411-412 Adv Comp & Con
- Span 433-434 Spanish Civilization
- Span 443 Adv Spanish Grammar
- Span 470 Golden Age
- Span 475-476 19th, 20th Cent Span Lit
- Span 483 Modernism
- Engl 213 World Literature Through the Renaissance
- Engl 215 Modern World Literature
- Engl 224 English Renaissance
- Engl 321-322 English Lit
- Engl 331 18th Century English Lit
- Engl 332 Early 19th Century
- Engl 425 Late 19th Century
- Engl 433 Shakespeare
- Engl 439 Recent British Lit
- Engl 519 Comparative Novel
- Engl 523 Adv Neo-Classical Lit
- Engl 525 Victorian Literature
- Engl 526 Adv 17th Century Lit
- Engl 527 Adv Elizabethan Lit
- Engl 530 English Romantic Movement
- Engl 534 Advanced Shakespeare
- Art 212 Western Traditions in Art and Architecture
- Art 412 Studies in Modern or Contemporary Art or Design
- Music 230 Music Lit & Hist III
- Music 231 Music Lit & Hist IV
- Music 433 Music Lit V: 20th Century
- Phil 318 Modern Philosophy
- Rel 338 World Religions
- EurS 300 Culture (when repeated)

#### Area C. Others

Credit hours, dealing with Europe, may be earned in: Undergraduate Course Specials, Living and Study Abroad Programs, and Field Experience and internships. See departments for specific course numbers. The courses in Area C are applicable to the European Studies Program with the approval of the Coordinator and Program Committee.

## Foreign Languages (FL)

### College of Arts and Science

Professor Bates, head; Professors Baker, Barnes (Regental Professor, Dean Emeritus), Redhead, Richter, C. Sunde; Associate Professors Beattie, Iden; Assistant Professor B. Sunde

The objective of the department is to provide you with a command of a foreign language as part of a general education that will facilitate fulfillment of the goals of the College of Arts and Science. The study of a foreign language is an essential part of a true liberal education since it enables you to become familiar with another culture and to examine and compare the foreign culture with your own.

Those who specialize in the study of a foreign language may find employment as teachers, translators, interpreters, and in a variety of commercial and technical activities in international business or foreign relations.

Because a foreign language should be a useful tool rather than a dormant body of knowledge, skills in the four facets of language learning, namely reading, comprehension, speaking, and writing, are developed. Classes generally are taught in the foreign language and additional time may be assigned for training in the language laboratory.

## Professional Programs

Foreign Language students may select a curriculum that leads to the Bachelor of Arts or the Bachelor of Science degree. They may combine their language degree program with related options such as the Business-Economics Specialization, the Latin American Area Studies Program, the European Studies Program, or the Geographic-Technical Option-Foreign Languages. A second major or minor may also be desired.

## The Individual Major

A total of 36 semester credits is required in one language for a major in that language. In addition, majors who plan to teach must take FL 420, Foreign Language Teaching Methods.

## The Minor in a Foreign Language

Twenty (20) credits in one language are required for a minor in that language. In addition, minors who plan to teach must take FL 420, Foreign Language Teaching Methods.

## Teacher Education in a Foreign Language

Consult with the dean of the Education Division before registering for the first term of the junior year. See "Education Curriculum of Teachers of Academic Subjects" in the Education section of this catalog for requirements, plus MFL 420, Foreign Language Teaching Methods.

## Placement Examinations

Entering freshmen who have successfully completed two or more years of a foreign language in high school are encouraged to take a placement examination. In exceptional cases, transfer students may be required to take such examinations, for placement purposes.

Students tested will be assigned to the college course in the appropriate language according to the examination score. Those exempted from any part of the course sequence will receive credit for the exempted portion upon successful completion of one additional semester of the exempted foreign language at this institution, and payment of the corresponding fee (\$5).

## Alternatives to Traditional Study

The department actively participates in the College of Arts and Science Alternatives and Options program. Refer to the corresponding section of the catalog and consult with your adviser or the head of the department.

Foreign Language courses are divided into the following areas: General courses in Foreign Languages (FL), French (Fren), German (Germ) and Spanish (Span).

## Degree Requirements

Those who seek a degree in a foreign language must meet the requirements of the Department, the College of Arts and Science, and the University. These requirements are set forth in the recommended curricula outlined below.

You must complete 128 credits, including 40 credits in courses numbered 300 or above to qualify for a degree.

## Curriculum in Arts and Science, Individual Foreign Language Major

Leading to the Bachelor of Arts degree (For double Foreign Language Major Option, see department head)

	F	S
<b>Freshman Year</b>		
Foreign Language (First Year).....	4	4
Fr Comp, Engl 101.....	3 or	3
Fund of Speech, SpCm 101.....	3 or	3
Hist. of West. Civ., Hist 121-122.....	3	3
Mathematics Elective.....		3-5
Fitness & Lifetime Activities, PE 100.....	1	1
Electives		
<b>Sophomore Year</b>	F	S
Foreign Language (Second year).....	3	3
Foreign Language (Composition & Conversation).....	2	2

Engl Lit elective (Appr. by adviser).....	3	
Natural Science electives.....	3-4	3-4
Humanities electives.....	3	3
Electives		

	F	S
<b>Junior Year</b>		
Foreign Language (Advanced Courses).....	4-5	4-5
Junior Comp, Engl 300.....	3	
Social Science elective.....	3	
History elective appropriate to major.....		3-4
Natural Science elective.....	3 or	3
Electives		

	F	S
<b>Senior Year</b>		
Foreign Language (Advanced Courses).....	4-5	4-5
Electives		

## Curriculum in Arts and Science, Individual Foreign Language Major

Leading to the Bachelor of Science degree

	F	S
<b>Freshman Year</b>		
Foreign Language (First Year).....	4	4
Fr Comp, Engl 101.....	3 or	3
Fund of Speech, SpCm 101.....	3 or	3
Hist. of West. Civ., Hist 121-122.....	3	3
Social Science elective.....		3
Mathematics elective.....		3-5
Fitness & Lifetime Activities, PE 100.....	1	1
Electives		

	F	S
<b>Sophomore Year</b>		
Foreign Language (Second Year).....	3	3
Foreign Language (Composition & Conversation).....	2	2
Engl Lit elective (appr. by Adviser).....	3	
Social Science electives.....	3	3
Biological Science electives.....	3	3
Electives		

	F	S
<b>Junior Year</b>		
Foreign Language (Advanced Courses).....	4-5	4-5
Junior Comp, Engl 300.....	3	
Social Science elective.....		3
Physical Science elective.....	4	4
History elective appropriate to major.....		3-4
Electives		

	F	S
<b>Senior Year</b>		
Foreign Language (Advanced Courses).....	4-5	4-5
Electives		

## Business-Economics Specialization

The Foreign Language/Business-Economics Specialization is a carefully planned selection of courses designed to enhance the foreign language major or minor in the field of business and/or to more fully equip him/her for admission to a Master's degree in international business and related programs. The specialization will require the completion of a minimum of twenty-four (24) credit hours from among the following courses in addition to the foreign language major or minor.

<b>Core</b>	
Math 111 - Algebra	
Econ 201 - Macroeconomics	
Econ 202 - Microeconomics	9 credits

## Choose 4 of the following courses:

Econ 330 - Money and Banking
Econ 353 - Marketing
Actg 210 - Actg I
AgEc 354 - Ag Marketing
AgEc 452 - Marketing Management
AgEc 479 - Ag Policy

PoSc 356 - International Law/Organization  
PoSc 351 - International Politics  
B-Ad 310 - Business Finance  
B-Ad 350 - Business Law I  
B-Ad 360 - Business Management  
Stat 341 - Statistics

12 credits

**Choose 1 of the following courses:**

Econ 405 - Comparative Systems  
Econ 540 - Econ of International Sector  
Econ 560 - Economic Development  
Econ 572 - Resource Economics

3 credits

**Total 24 credits**

Within the above framework, individually tailored specializations will be possible. They will be planned in consultation with and will be subject to the approval of, an adviser in the Department of Economics.

## Foreign Languages (FL)

### Undergraduate Courses

**101-102 Introduction to Foreign Language and Culture (Topical) 4(4,1)**

Fundamentals of language and introduction to related culture. Classwork supplemented with foreign language laboratory. May be repeated for credit.

**134 Foreign Cultures (Topical) 3(3,0)**

Life, thought, culture and language of one of the subject peoples. Provides a broad view of the civilization of the French or German or Spanish-speaking people, including history; literature, institutions, social life, customs, political structures, etc. If appropriate, it will include the study of the subject people's heritage in South Dakota. No prerequisites. Intended for students from all disciplines. May be repeated for credit twice if the topic changes. Taught in English. Not valid for meeting foreign language requirements.

**394 Undergraduate Course Specials 1-5(1-5,0)**

Refer to the Arts and Science Alternatives and Options statement.

**395 Living & Study Abroad Program 1-6(1-6,0)**

Refer to the Arts and Science Alternatives and Option statement. Prior approval by the department head and dean required.

**420 Foreign Language Teaching Methods 1-3(1-3,0)**

Seminar dealing with problems encountered in teaching modern foreign languages. Textbook selection, subject matter presentation, testing, realia and laboratory techniques. Consult with head of the department during year previous to taking this course. Required for all foreign language majors and minors who plan to teach. On demand.

**423 Seminar in French, German or Spanish (Topical) 1-3(3,0)**

Detailed reading and discussion of major works dealing with French, German or Spanish language, literature or culture. Focus on language, literary appreciation, writers, culture, or artistic movements. Students will be expected to express themselves in the particular language, both orally and in writing. Reports in the foreign language will be required. Topics will vary, and course may be repeated for a maximum of 9 credit hours. Prerequisites: two years of college French, German, or Spanish, or consent of instructor.

**494-495-496 Cooperative Education/Internship/Field Experience (Topical) 3-12(3-12,0)**

A student who has the opportunity to become involved in an off-campus activity which promises to contribute significantly to his/her education, such as employment or study abroad or a foreign language related cooperative education experience, may enroll for and receive between 3 and 12 credits at a maximum rate of one credit per week. You must obtain permission to register for such credits from the department. The experience will be planned and method of evaluation and grading established by an instructor in consultation with you under the general supervision of the department head. The project will require approval of the departmental faculty. Grades may be based on either the A-F or E, F systems. Upon termination of the project, copies of the final examination, report or other evaluation will be placed in your cumulative file in the Office of Student Affairs. P, junior standing.

### Graduate Courses

**590-690 Special Topics in Language and Culture 1-3(1-3,0)**

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.

**592-692 Seminar in Literature (Topical) 1-3(1-3,0)**

Seminar on a selected author or period including the cultural climate in which the literature was written. Reading, class discussion, and a written paper will provide an opportunity to renew or improve skills in the language and to deepen understanding of the culture. May be repeated for credit.

## French (Fren)

### Undergraduate Courses

**101-102 Intro to French Language & Culture 4(4,1)**

Fundamentals of language structure and introduction to French culture enabling student to converse, read, and write simple French. Classwork supplemented with Foreign Language laboratory.

**201-202 Language & Culture of France 3(3,1)**

Aims of the introductory course continued. Emphasis on cultural and intellectual aspects of French life and literature. Classwork supplemented with foreign language laboratory. If enrolling in this course you are urged to study 311-312 concurrently. P, Fren 102 or equivalent.

**311-312 French Composition & Conversation 2(2,1)**

Development of ability in composition and conversation. Classwork supplemented with foreign language laboratory. P, Fren 201-202 or concurrent.

**353 Theatre et Nouvelles 3(3,0)**

Intro to French literature through reading and discussion in French of selected plays and short stories. P, Fren 202 or consent.

**354 Poesie et Romans 3(3,0)**

Intro to French literature through reading and discussion in French of selected poetry and novels. P, Fren 202 or consent.

**411-412 Advanced Composition & Conversation 2(2,0)**

Review of grammar, written composition, and intensive practice in speaking. P, Fren 312. On demand.

**433-434 French Civilization 2(2,0)**

First semester reviews historical development of French nation from its inception to modern times. Second semester presents a view of contemporary French life and culture. P, Fren 312 or consent. On demand.

**73 Le Grand Siecle 3(3,0)**

Reading and analysis of baroque and classical literature of the 17th century, emphasis on Corneille, Racine, Moliere, and Madame de Lafayette. P, 354 or consent. On demand.

**475 Raison et Sensibilite Au 18 Siecle 3(3,0)**

Reading and analysis of major literature works from Manon Lescant to Les Liaisons dangeureuses. P, 354 or consent. On demand.

**477 Du Romantisme au Symbolisme 3(3,0)**

Reading and analysis of selected prose fiction, poetry and drama of the 19th century. P, 354 or consent. On demand.

**479 Le Vingtieme Siecle 3(3,0)**

Reading and analysis of representative works of novelists, poets and dramatists of the 20th century. P, 354 or consent. On demand.

**490 Directed Study in French 1-3(1-3,0)**

Readings and discussions in French as directed by the instructor. May be repeated for credit. P, two years of the language and/or consent.

## German (Germ)

### Undergraduate Courses

**101-102 First-Year German 4(4,1)**

Fundamentals of language, enabling you to understand, speak, read, and write simple German. Classwork supplemented with foreign language laboratory.

**201-202 Second-Year German 3(3,1)**

Aims of first-year German continued with emphasis on modern cultural aspects of the two Germanies, Austria, and Switzerland. Classwork supplemented with foreign language laboratory. If enrolling in this course you may study 311-312 concurrently. P, Germ 102 or equivalent.

**311-312 German Composition & Conversation 2(2,0)**

Development of ability in composition and conversation focusing on typical situations in everyday German life. P, Germ 201-202 or concurrent.

**321 Scientific German 1(1,0)**

Emphasis on reading and translation of scientific German. P, Germ 202 or concurrent.

**353-354 German Literature 3(3,0)**

Introduction to German literature through readings and discussion in German of representative literary works from various genres and epochs. P, Germ 312 or consent.

#### **411-412 Advanced Composition & Conversation 2(2,0)**

More intensive development of ability in composition and conversation, placing special emphasis on idiomatic expressions and flexibility within the language. P, Germ 311, 312. On demand. Topics vary. May be repeated once for credit.

#### **433-434 German Civilization 2(2,0)**

German civilization and culture including music, art, literature, government, geography, education, etc. 433: from beginning of German civilization to 1869. 434: from 1870 to present. Readings and discussions in German. P, Germ 311, 312 or consent.

#### **470 Rationalism, Rococo, Sturm und Drang 3(3,0)**

German literature from the time of Gottsched to the end of Sturm und Drang. First half of the course is devoted to Rationalism, Rococo and some lesser literary movements of that time. Second half deals with Sturm und Drang. Readings and discussions in German. P, Germ 354 or consent. On demand.

#### **471 German Classicism 1785-1805 3(3,0)**

Works of Goethe and Schiller. Readings and discussions in German. P, Germ 354 or consent. On demand.

#### **473 German Romanticism 3(3,0)**

Some of the major writers of the Romantic period. Readings and discussions in German. P, Germ 354 or consent. On demand.

#### **475 19th Century German Lit 3(3,0)**

German literature between Romanticism and the turn of this century. Readings and discussions in German. P, Germ 354 or consent. On demand.

#### **476 Novelle 3(3,0)**

The Novelle genre from its inception in German literature to the present. Reading and discussions in German. P, Germ 354 or consent. On demand.

#### **479 20th Century German Lit 3(3,0)**

Selected works of authors in the German language. Readings and discussions in German. Topics vary. P, Germ 354 or consent. On demand.

#### **491 Directed Study in German 1-3(1-3,0)**

Readings and discussions in German as directed by instructor. May be repeated for credit. P, two years of the language and consent.

## **Spanish (Span)**

### **Undergraduate Courses**

#### **101-102 First-Year Spanish 4(4,1)**

Fundamentals of the language are introduced to aid you in learning to understand, speak, read and write Spanish. Hispanic culture is discussed and classwork may be supplemented by the language laboratory.

#### **201-202 Second-Year Spanish 3(3,1)**

Aims of first-year Spanish continued. Selected readings may be included. Classwork may be supplemented with language laboratory, audio-visual materials, and resource people. Spanish 311-312 may be studied concurrently with Spanish 201-202. P, Span 102 or equivalent.

#### **283 Applied Spanish (Topical) 1-3(1-3,0) On demand**

Practical Spanish useful in diverse situations, such as conversation, foreign travel, commerce, the theatre, etc. Topics will vary. May be repeated for a maximum of nine (9) credits. P, 102 or consent. Classwork may be supplemented by language laboratory.

#### **311-312 Spanish Composition & Conversation 2(2,1)**

Practice in composition and conversation. Classwork may be supplemented with foreign language laboratory. P, Span 201, 202, or concurrent.

#### **353-354 Spanish Literature 3(3,0)**

Introduction to Spanish literature through reading and discussion in Spanish of recognized works. P, Span 202 or consent. On demand.

#### **355-356 Spanish American Lit 3(3,0)**

Introduction to Spanish American literature through reading and discussion in Spanish of recognized works. P, Span 202 or consent. On demand.

#### **411-412 Spanish Advanced Composition & Conversation 2(2,0)**

Polishing of all language skills to achieve maximum fluency. P, Span 311-312 or consent. On demand.

#### **433-434 Spanish Civilization 2(2,0)**

The variety of topics studied may include history, culture, art, architecture, literature, geography, government and religion. P, Span 202 or consent. On demand.

#### **435-436 Spanish American Civilization 2(2,0)**

The variety of topics studied may include history, culture, art, architecture, literature, geography, government and religion. P, Span 202 or consent. On demand.

#### **443 Advanced Spanish Grammar 3(3,0)**

In-depth study of traditional grammar as well as an introduction to linguistics as it applies to Spanish. Practical application. Strongly recommended for future teachers and bi-lingual secretaries. P, Span 202. On demand.

#### **470 The Golden Age 3(3,0)**

Major works of the Golden Age of Spanish literature (1492-1682). Emphasis may vary. Classes in Spanish. P, Span 353-354 or consent. On demand.

#### **475-476 19th & 20th Century Spanish Literature 3(3,0)**

Major movements and works. Reading, writing and discussions in Spanish. Topics vary. P, Span 353-354 or consent. On demand.

#### **481 Hispanics in the U.S. 1-3(1-3,0) On demand.**

A variety of topics may be covered including history, art, culture, literature, politics, religion and geography. P, 202 or consent.

#### **484 20th Century Spanish American Literature 3(3,0)**

Major movements and works. Reading, writing and discussions in Spanish. Topics vary. P, Span 355-356 or consent. On demand.

#### **491 Directed Study in Spanish 1-3(1-3,0)**

Readings and discussions in Spanish as directed by the instructor. May be repeated for credit. P, two years of the language and consent.

## **Forestry (F)**

**(See Horticulture, Forestry, Landscape and Parks)**

## **General Engineering (GE)**

### **College of Engineering**

Professor Sander, head; Associate Professors Heusinkveld, Sorensen; Assistant Professor Kreyger; Instructors, Lellelid, Leiferman, R. Svec; Emeritus Professors, Anderson, Skubic, H. Svec, Wakeman

The General Engineering Department offers courses in introductory engineering topics, interdisciplinary engineering topics, and technical laboratory experiences required for accreditation of engineering programs in the College of Engineering by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET). In addition, the degree of Bachelor of Science in Technology (BST) is offered for those individuals interested in applications oriented programs. Within this degree offering, there is the Electronics Engineering Technology (EET) program. The number of credits required to satisfy the EET program requirements is 128 credits.

Through academic advising, the department provides to the students who are undecided in their choice of a specific engineering or technology discipline, an opportunity to consider many options while taking the fundamental courses required in most technical majors. Guidance is also provided for those students who are not pursuing professional engineering degree programs but wish to establish a fundamental understanding in a technical area. These studies can prepare students for entrance into various types of technical fields including sales, construction, industrial electronics, manufacturing, laboratory testing, etc. Since all courses are college credit courses, most or possibly all of the courses taken can be used to satisfy requirements for graduation in many 4-year programs.

Students wishing to transfer to the General Engineering Department for engineering, general technical studies, or the Electronics Engineering Technology program are required to have a grade point average (GPA) of 2.0 or greater.

Courses in General Engineering are listed as Engineering Graphics (EG), Engineering Mechanics (EM), Engineering Shops (ES), General Engineering (GE), and Electronics Technology (ET).

## General Engineering (GE)

General Engineering courses present topics of inter-disciplinary nature which relate to, or are utilized by all engineers to perform their professional duties.

## Undergraduate Courses

**110 Orientation for Engineers** 0(1,0) FS

**231 Technology & Society** 2(2,0)

An examination of technological change by means of current problems and case studies. The creation and utilization of tools, machines, materials, techniques and technical systems will also be studied, as well as the life and works of various innovators in science and technology.

**270 Special Topics** 1-3 FSSu

**290 Special Problems** 1-3 FSSu

P, consent.

**422 Engineering Economy** 2(2,0) FS

Economic aspects of engineering, cost estimating and financing. P, senior standing.

**457 Systems Engineering Honors Colloquium** 1(1,0)

Current examples of complex engineering projects which utilize the systems approach. Students may be expected to present a talk on some phase of Systems Engineering. May be repeated for credit as often as desired, but only a total of 3 credits of GE 457 and GE 491 may be counted as engineering technical electives. Open to any student admitted to the Honors Program.

**491 Systems Engineering Honors Directed Studies** 2(0,4)

Honors students choose, and carry out, a Systems Engineering project which must involve components from more than one engineering discipline. This course may be taken up to four times, but the student must register for GE 457, Systems Engineering Honors Colloquium, each time GE 491 is elected. Only a total of three credits of GE 491 and GE 457 may be counted as engineering technical electives. open to any student admitted to the Honors Program.

**494-495-496 Cooperative Education/Internship/Field Experience** 1-6 FSSu

Planned and supervised professional experience related to engineering which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

## Graduate Courses

The Master of Science in Industrial Management degree is offered by the Department of General Engineering and coordinated through the College of Engineering with the University of South Dakota School of Business as well as other colleges on the SDSU campus. This degree provides an opportunity for technically oriented students to broaden their management knowledge or management oriented student to broaden their technical knowledge and thereby become better industrial managers. The program is provided for traditional as well as non-traditional students who recognize the need for additional training in order to improve their management and technical skills.

**590-690 Special Topics in Engineering** 1-3

Advanced and timely interdisciplinary topics relating to more than one field of physical science and engineering. P, senior or graduate standing in Engineering or Mathematics.

**600-601 Seminar** 0-1(1,0) FS

**770 Engineering Design or Research Paper** 1-2

## Engineering Graphics (EG)

The Engineering Graphics courses are provided to satisfy the drafting skills requirements of the accredited engineering departments in the College of Engineering. The course offerings are administered and taught by staff from the General Engineering Department.

## Undergraduate Courses

**121 Engineering Design Graphics I** 2(0,6) FS

Analysis of projection. Methods of systematic interpretation and representation of data, problems, and three-dimensional shapes. Functional scales, mathematical charts and graphs. Development of instrument drawing and sketching as a means of design. P, Math 111 or equivalent.

**122 Engineering Design Graphics II** 2(0,6) FS

Continuation of EG 121. Vector geometry. Graphical conventions and design applications as expressed through free hand technical sketching. Introduction to computer graphics. P, 121, Math 120 or equivalent.

**223 Architectural Design Drafting** 3(1,6) S

Frame building construction. Practice in modern drafting procedures. Opportunity to design a building. P, EG 121 or consent.

**231 Technical Sketching** 1(0,3) S

Engineering interpretation, expression and design through free hand sketching of orthographic and pictorial representations related to intricate geometric shapes, assemblies, exploded views, diagrams. P, EG 121.

**233 Machine & Tool Drawing** 3(1,6) F

Representation of machine elements and assemblies. Functional dimensioning, drafting simplification design of jigs and fixtures. P, EG 121, ES 121.

**234 Graphic Mechanisms** 2(1,3) S

Fundamentals of linkages, displacements, cams and gears. Analysis of manufacturing methods, velocities, accelerations, and inertia forces in machines. P, EG 121; Math 120 or equivalent.

## Pre-Architecture

The College of Engineering through General Engineering and its advisement program offers a pre-architectural program for students who have interests in architecture. Architects must have knowledge of building design, materials, structural elements, mechanical and electrical equipment, acoustics, and illumination. These areas are covered in the fields of Civil, Electrical, and Mechanical Engineering.

The engineering staff is well qualified to serve as advisers for architectural students. Staff members are familiar with architectural programs that are offered at other schools and some have close associations with architects or architectural firms. The first and second year architecture curriculums can be very similar to the engineers' curriculum.

Advisers will help plan sequences of courses which will prepare a student for transfer to any specific college of architecture. A general program of study can be arranged that will allow transfer to any college.

## Engineering Mechanics (EM)

Course objectives in Engineering Mechanics are to develop an educational background by a thorough understanding of basic subjects common to various branches of engineering. Courses are designed to emphasize basic theory and to present applications in different areas of engineering.

Courses are taught by staff from the Civil Engineering and Mechanical Engineering Departments.

## Undergraduate Courses

**221 Statics** 3(3,0) FS

Vector algebra, forces, moments, couples; principles of statics, resultant and equilibrium of force systems, free body diagrams, centroids; analysis of statically determinate states of equilibrium. P, Math 123, Phys 211 or consent.

**222 Dynamics** 3(3,0) FS

Vectorial kinematics and kinetics; absolute and relative motion, force-mass-acceleration relations, potential and kinetic energy, work, and power, impulse, momentum, conservation of energy and momentum. Application to particles, particle systems and rigid bodies. Free vibrations of single-degree-of-freedom systems. P, EM 221.

**223 Engineering Mechanics** 3(3,0) FS

Basic of statics and dynamics. P, Math 224 and Phys 211 or consent.

**321 Mechanics of Materials** 3(3,0) FS

Two dimensional analysis of stress and strain, principal stresses. Mohr's circle; stresses in members subjected to centric, torsional and flexural loadings; deflections of beams. P, EM 221.

### 322 Mechanics of Materials 1(0,3) FS

Laboratory verification of fundamental principles of structural and machine elements and tests of properties of materials. P, concurrent with 321.

### 331 Fluid Mechanics 3(3,0) FS

Fluid properties, statics and dynamics of real and ideal fluids; continuity and Navier-Stokes equations applied to laminar and turbulent incompressible flows, boundary layer analysis. Introduction to compressible flow. P, EM 222, Math 321.

## Graduate Courses

### 521-621 Introduction to Mechanics of a Continuous Medium 3(3,0) (On sufficient demand)

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.

### 522-622 Theory of Elasticity 3(3,0)

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.

### 523-623 Theory of Plasticity 3(3,0)

Analysis of stress and strain; plastic behavior of materials; basic laws of plastic flow; applications to bending of beams, torsion of bars and thick-walled cylinders; slip line theory and its application to extrusion problems; limit analysis theorems and their applications to structural problems. P, EM 522-622 or consent.

### 524-624 Theory of Plates & Shells 3(3,0)

Small deflection theory of plates. Laterally loaded rectangular plates. Navier and Levy solutions. Plates of various shapes, boundary conditions and loading systems. Basic equations of the theory of shells. Design problems in cylindrical shells. P, EM 321, Math 321, Math 331 or consent.

### 531-631 Advanced Fluid Mechanics 3(3,0)

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.

### 541-641 Finite Element Analysis 3(3,0) Alternate years

Theoretical basis of finite element analysis — an approximate method which analyzes problems by 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.

## Engineering Shop (ES)

Courses in Engineering Shops concentrate on the various industrial processes closely associated with practical engineering principles. Working with machine tools and other equipment the student will acquire an understanding of properties of materials, and various treatments of materials for specific operations and purposes.

The Engineering Shops are well equipped with precision measuring instruments, machine tools and welding equipment representing recent engineering developments in metal processing.

Facilities for research are also provided for metal processing and for construction of experimental equipment for other university departments.

Courses in Engineering Shops are administered by the General Engineering Department. The courses are taught by staff from the General Engineering and Mechanical Engineering Departments.

## Undergraduate Courses

### 121 Machine Shop 2(1,2)

Machine tools in industry, principles of operation, production methods and related equipment. Introduction to jigs and fixtures.

### 131 Welding 2(1,2)

Lectures, demonstrations and exercises. Gas and arc welding, cutting, heat treatment, spot welding and related information.

### 222 Machine Shop 2(1,2)

Complicated processes involving operation of machine tools. Introduction to tool and die work and methods of inspection. P, 121.

### 223 Machine Shop Problems 1(0,3)

Emphasis on tool making and solution of individual problems in set up work. P, 222 or 225.

### 225 Metal Processing 1(0,3)

Problems and solution related to industrial machine tools and other production equipment, automation, numerical control, and introduction to metal casting. P, recommended for engineering students.

### 232 Welding 2(1,2)

Advanced application of arc and gas welding, position welding, pipe welding and joining of non-ferrous metals. Identification of metals. P, 131.

### 233 Welding & Metallurgy 2(1,2)

For technical students. Enough metallurgy to give you a basis for determining whether or not welding can be applied, and to predict success or failure. P, 232.

### 235 Metal Processing 1(0,3)

Engineering approach to science of joining metals. Capabilities and limitations of present equipment. Brief introduction to metallurgy, heat treatment of steel and characteristics of other metals and alloys. Gas welding, arc welding and related equipment. P, recommended for engineering students.

### 241 Shop 1(0,3)

Use of sheet metals in manufacture of electrical equipment. Layout, punch press dies, spot welding, soldering and mechanical methods of fastening sheet metal. P, EG 121.

## Electronic Engineering Technology (ET)

The Bachelor of Science in Technology with a major in Electronics Engineering Technology is a unique program available only at SDSU in South Dakota. This program is administered under the Department of General Engineering. It prepares graduates for employment in business and industry with an in-depth competence in Electronics Technology as well as providing the diversity of a baccalaureate degree. The Electronic Engineering Technology (EET) program at SDSU is committed to offering a comprehensive technical education to fill the Electronic Engineering Technology manpower needs of South Dakota and the upper Midwest.

An Electronics Engineering Technologist serves to support the engineer in a manner requiring application of both theoretical knowledge and related technical skills. Working with information supplied by the engineer, the engineering technologist builds prototype models, trouble-shoots, modifies, and supervises production of electronic products. The electronics program at SDSU is designed to develop the skill and knowledge needed to perform the above functions as well as develop management skills applicable to the electronics industry.

Students admitted into the EET program are required to maintain at least a "C" average in the EET courses. Transfer credit will normally be allowed for vocational technology coursework where course content equivalency can be established. Students will be admitted to upper level courses only after they have successfully completed ET 112, 113, 120, and 121 or equivalents.

Through cooperative education in the Electronic Engineering Technology program SDSU is committed to offering performance-based work experiences. Since the best place to measure job performance is on the job, a flexible, student-centered Cooperative Education program is offered. The purpose of the co-op program is to provide realistic educational experiences in the world of work. The student will become acquainted with attitudes, skills, and knowledge relevant to success on the job. All electronics co-op credits are awarded based on a work station evaluation by the student's adviser and approved by the Electronics Program staff. With permission of the student's adviser a student may enroll in the Electronics Cooperative Education Program after successfully completing one semester at SDSU.

### 100 Introductory Electronics 3(3,0)

Nonmathematical survey of fundamental electronic components and circuits.

### 112 DC and AC Concepts 5(5,0) F

Direct and alternating current circuits. Topics covered are basic laws and theorems directed toward resistive and reactive circuits. P, Math 111 or concurrent enrollment.

**113 DC and AC Concepts Laboratory 3(0,6) F**

Laboratory experiences with basic components such as resistors, capacitors and inductors. Direct current and alternating current used in the analysis. P, concurrent enrollment in ET 112 or consent.

**120 Circuits 5(5,0) S**

Active and passive components and the interrelationships involved in circuit combinations. P, ET 112 or equivalent.

**121 Circuits Laboratory 3(0,6) S**

Basic circuits, circuit parameters, and various circuit applications. Both discrete and integrated circuits are studied. P, ET 112, ET 113 or equivalent.

**210 Logic Circuits 3(3,0) S**

Switching theory, Boolean Algebra and logic diagrams, Karnaugh mapping, counter circuits, binary, octal and hexadecimal number systems. P, ET 100, ET 112, or equivalent.

**220 Radio Systems 3(2,0) F**

Radio from a black box-block diagram standpoint. Emphasizes the application of basic circuit concepts to superheterodyne receivers.

**232 FM and Stereo Circuits 3(3,0)**

Concentrated study of frequency modulated receivers, stereo multiplex, and stereo amplifiers. Speakers and enclosures will also be studied. P, ET 120 or equivalent.

**233 FM and Stereo Circuits Laboratory 1(0,3)**

Laboratory analysis of FM receivers and stereo devices. Proper servicing procedures emphasized. P, ET 121 or equivalent.

**302 Discrete & Integrated Devices 3(3,0) F**

Physical principals of transistors, tunnel diodes, light emitting diodes, photo diodes, differential amplifiers, operational amplifiers, and other linear circuits. P, ET 120 or equivalent.

**340 Techniques of Servicing 2(2,0) S**

The practical aspects of servicing many types of electronic equipment. The latest techniques and equipment will be available for demonstration and laboratory usage. P, ET 120 or equivalent.

**350 Resonating Systems 3(3,0) F**

Radio wave propagation, transmission line theory, and antennas. Emphasis is placed on conduction of radio waves from a source to a load and its propagation through space. Laboratory demonstrations are used as needed. P, ET 120 or equivalent.

**360 Resonating Systems 3(3,0) S**

Complex resonant circuits, antenna arrays, impedance matching devices, transmission lines and microwave components. Emphasis is placed on antenna systems and related components. P, ET 350 or equivalent.

**370 Instrumentation 1(0,3)**

The student is given an opportunity to study the operation and theory of a variety of electronic instruments used in industry. P, ET 120 or equivalent.

**374 Digital Computer Fundamentals 3(3,0) F**

Counters, pulse circuits, memories, and basic computer operations. Computer training devices are used to study the principles of computer operation. P, ET 210 or equivalent.

**375 Advanced Electronics Laboratory 2(0,6) F**

Experiments are performed on the advanced circuits discussed in ET 374. P, ET 121 or equivalent.

**380 Prototype Techniques 2(0,6) S**

A lecture-laboratory course to acquaint the student with procedures used to prototype and construct circuits used in electronics. Topics include metal chassis pre-fabrication, printed circuit board layout and production, design techniques for audio and RF circuits and final test procedures. P, ET 302 or equivalent.

**384 Industrial Circuits and Controls 4(4,0) S**

Industrial type circuits. Types of circuits studied include: gaseous rectifiers, thyratrons, silicon-controlled rectifiers, light control systems, solid state devices, magnetic amplifiers, and servo systems. P, ET 374.

**385 Advanced Electronics Laboratory 2(0,6) S**

Experiments are performed on the advanced circuits discussed in ET 384. P, ET 375 or equivalent.

**401 Microprocessors/Microcomputers 3(3,0) F**

The design of and use of the microprocessor in microcomputers and process control applications. Includes concepts, properties, and basic architecture of a microprocessor and peripheral circuits. Hands-on experience is provided on a microprocessor-based microcomputer. P, ET 374 or equivalent.

**402 Microprocessor Structure & Programming 3(3,0) S**

Additional experience in the programming and architecture of microprocessors. A study of design and use of the microprocessors in microcomputers and process control applications. P, ET 401 or equivalent.

**430 TV Circuits I 3(3,0) F**

Study of circuits used in television. The theory of operation concerning transistorized television as well as tube type is covered. Both color TV and monochrome are studied simultaneously. P, ET 120 or equivalent.

**431 TV Circuits Laboratory I 2(0,6) F**

Laboratory analysis of the operation of color and monochrome television. Individual circuits of the receiver are experimented with separately. Operation of various test instruments stressed. P, ET 121 or equivalent.

**440 TV Circuits II 3(3,0) S**

Study of circuits used in television. The theory of operation concerning transistorized television as well as tube type is covered. Both color TV and monochrome are studied simultaneously. P, ET 430 or equivalent.

**441 TV Circuits Laboratory II 2(0,6) S**

Laboratory analysis of the operation of color and monochrome television. Individual circuits of the receiver are experimented with separately. Operation of various test instruments is stressed. P, ET 431 or equivalent.

**450 Communications Circuits I 3(3,0) F**

Study of transmitters, receiver circuits and related systems. Principles of modulation detection, amplification, and generation of radio frequency signals. Emphasis is placed on mobile and fixed radio systems. P, ET 120 or equivalent.

**451 Communications Circuits Laboratory I 2(0,6) F**

Laboratory work consisting of analyzing and troubleshooting communications equipment. Usage of test equipment such as deviation meters, frequency counters, signal generators, service monitors, power meters, etc. Basic two-way radio installation is also covered. P, ET 121 or equivalent.

**460 Communications Circuits II 3(3,0) S**

Complex radio systems including repeaters, remote control systems, mobile telephone, and paging system. Systems design and troubleshooting techniques are studied as well as microwave and basic radar systems. P, ET 450 or equivalent.

**461 Communications Circuits Laboratory II 2(0,6) S**

Laboratory work in advanced troubleshooting of transmitters, receivers and control systems. Familiarization with sophisticated test equipment is stressed as well as simplified, pragmatic servicing techniques in system testing and alignment. P, ET 451 or equivalent.

**490 Seminar in Electronics Technology 1(1,0)**

Designed to meet special needs of the students and provide special topic presentations. Intended also to help students determine their areas of specialization.

**497 NICET Certification Preparation 2(2,0)**

A coordination of communications skills, mathematics, physical science, and basic technical concepts and skills in the student's area of study in preparation for the NICET certification examination. P, Approval of academic adviser and/or instructor.

**292/492 Special Problems 1-3 FSSu**

Provides the student with the opportunity to identify a problem and develop a hypothesis, gather information which might be used in solving the problem, work on solving the problem, and report actual findings and accomplishments. P, Permission of the instructor.

**293/493 Special Topics in ET 1-3**

Current selected topic areas in Electronic Engineering Technology. P, Permission of the instructor.

**294/494-295/495-296/496 Cooperative Education Internship/ Field Experience 1-8 FSSu**

Supervised work experience with a business, industrial firm, or public agency. The work experience must relate to the student's program of study and be performed under institutional and discipline guidelines governing this type of educational experience. P, departmental approval.

**404 Integrated Circuit Technology 3(3,0)**

Digital and linear IC circuits and assemblies as used in equipment and large scale integration. This builds to a summary of where and how IC assemblies exist in the real world of communication, data processing and numerical control. P, ET 302 and/or permission of the instructor.

**Curriculum in Engineering****Electronics Engineering Technology Major****Freshman Year**

	F	S
DC & AC Concepts, ET 112.....	5	
DC & AC Concepts Lab, ET 113.....	3	
Algebra, *Math 111.....	3	
Engineering Design Graphics I, EG 121.....	2	
Freshman Composition, Engl 101.....	3	
Fitness and Lifetime Activities, PE 100.....	1	
Circuits, ET 120.....		5
Circuits Lab, ET 121.....		3
College Algebra & Trig, *Math 113.....		5



PASCAL Programming, CSc 114.....	2
Fitness and Lifetime Activities, PE 100.....	1
Engineering Orientation, GE 110.....	0

**Sophomore Year**

Radio Systems, ET 220.....	F 2
Mathematical Analysis I, Math 123.....	5
Elementary Physics I, Phys 111.....	4
Psychology Elective.....	3
Elective (Nonrestricted).....	2
Logic Circuits, ET 210.....	4
Math Elective.....	4
Elementary Physics II, Phys 113.....	3
Fundamentals of Speech, SpCm 101.....	3
Humanities Elective.....	3

**Junior Year**

Digital Computer Fund, ET 374.....	F 3
Advanced Electronics Lab I, ET 375.....	2
Discrete & Integrated Devices, ET 302.....	3
Special Topics, GE 270.....	2
(CAD — Electronics Tech)	
Technical Communications, Engl 303.....	3
Humanities Elective.....	3
Industrial Circuits, ET 384.....	4
Advanced Electronics Lab II, ET 385.....	2
Techniques of Servicing, ET 340.....	2
Prototype Techniques, ET 380.....	2
Social Science Elective.....	3
Microeconomics Principles, Econ 202.....	3

**Senior Year**

TV Circuits I, ET 430.....	F 3
TV Circuits Lab I, ET 431.....	2
—OR—	
Communications Circuits I, ET 450.....	3
Communications Circuits Lab I, ET 451.....	2
—AND—	
Microprocessor Structure & Prog., ET 401.....	3
Technical Elective.....	3
Business Management, B-Ad 360.....	3
Elective (Nonrestricted).....	2
TV Circuits II, ET 440.....	3
TV Circuits Lab II, ET 441.....	2
—OR—	
Communications Circuits II, ET 460.....	3
Communications Circuits Lab II, ET 461.....	2
—AND—	
Microprocessor Structure & Prog., ET 402.....	3
Technical Elective.....	3
Elective (Nonrestricted).....	3

\*Courses need not include these numbers; however, minimum math requirements must include one year of Calculus.

## Geography (Geog)

### College of Arts and Science

Professor Hogan, Head; Professor Gritzner, C., Johnson, Landis, Opheim; Visiting Professor An-xin; Associate Professors Draeger, Wilner; Assistant Professors Berg, Gab, Gritzner, J., Loveland, Samuelson, Sandness.

As society grows more complex and science and technology open new frontiers of knowledge, an understanding of geography and what it entails becomes more important. Geography is the science that seeks to describe, relate and explain those things, both natural and cultural, that distinguish places on the earth's surface. As such, a fundamental theme in geography is the process of continual change, and how humans modify the earth as their cultural

value system and level of technology dictate. The study of geography is thus of vital concern to all citizens and should be a significant part of the education of all students.

The undergraduate program is designed to provide you with a broad education with a concentration in the major field of study. It is recommended you take several courses in disciplines closely related to your specific area of interest in geography. Those interested in physical geography might take associated courses in physics, agricultural sciences, botany or other related disciplines. If interested in cultural geography, work in sociology, history, political science or foreign language might be recommended. For economic geography, outside work in economics might be beneficial.

Two bachelor's degrees, the Bachelor of Arts and the Bachelor of Science are available. In addition to the standard degree programs, there are presently available three options in the Geography major: the Geographic Technical, Environmental Management, and the Urban and Regional Planning. The Geographic Technical Option stressing research techniques and/or foreign language is oriented towards future employment in governmental, industrial, military, or planning positions. The Environmental Management Option is designed to prepare you for careers in governmental, industrial, managerial and recreational areas. The Urban and Regional Planning Option is designed to prepare you for positions with governmental agencies, industry and real estate and commercial corporations.

The Master of Science degree is offered for students interested in graduate work in geography.

Courses in Geography fall into two major categories: (1) systematic — the character and distribution of elements of the physical environment (physical geography) and our basic activities in response to the physical environment (cultural geography), and (2) regional — the occurrence of physical and cultural elements within a particular area or place. The study of geography provides you with methodology and techniques for research and teaching functions by enabling you to understand our physical and cultural environment.

#### Curriculum in Arts and Science, Geography Major Leading to the Bachelor of Arts degree

	Credits
BASIC UNIVERSITY REQUIREMENTS.....	62-64
Fr. Comp, Engl 101 and Junior Comp., Engl 300.....	6
Fund of Speech, SpCm 101.....	3
Fitness & Lifetime Activities, PE 100 (two semesters required)...	2
Foreign Language.....	14
Humanities (from two disciplines on approved list).....	16
Mathematics (any Math course).....	3
Physical Geography, Geog 131 and 132.....	8
Natural Science elective (from approved list).....	3-4
Social Science (from two disciplines on approved list).....	12
MAJOR (including Geog 131, 132, 200, one Regional Course, and 18 hours of upper division courses).....	32
ELECTIVES (including 24 hours for prospective teachers, option electives and/or free electives).....	32-34
Total Hours.....	128

#### Curriculum in Arts and Science, Geography Major Leading to the Bachelor of Science Degree

	Credits
BASIC UNIVERSITY REQUIREMENTS.....	48
Fr Comp, Engl 101 and Junior Comp, Engl 300.....	6
Fund of Speech, SpCm 101.....	3
Fitness & Lifetime Activities, PE 100 (two semesters required)...	2
Humanities (two disciplines from approved list).....	9
Mathematics (any Math course).....	3
Natural Science Physical Geography, Geog 131 & 132.....	8
Biological Science (from approved Biological Science courses on the Natural Science list).....	6
Social Science (two disciplines from approved list).....	12

MAJOR (including Geog 131, 132, 200, one Regional Course, and 18 hours of upper division courses) .....	32
ELECTIVES (including 24 hours for prospective teachers, option electives and/or free electives).....	48
Total Hours.....	128

**Suggested Optional Electives in the Geography Majors Environmental Management (Credits)**

WL 210 (2); Recr 440 (2); †Electives in the Physical Environment (9); †Electives in the Cultural Environment (9); Total 22

**\*Urban and Regional Planning**

Option electives to be selected from departmental list of courses in CE, EG, La, Plan, PolS, PS, Recr to total 18 credits.

**†Technical Geography — Science (Credits)**

Physical Science Electives (6); Agricultural Science, Engineering Science, or Math Electives (6); MCom 160 (2); CSc 112 (2); Stat 341 (3); Total 19.

**†Technical Geography — Foreign Language (Credits)**

Advanced Foreign Language (12); MCom 160 (2); CSc 112 (2); Stat 341 (3); Total 19.

**MAJOR: 32 hours**

Including Geog 131, 132, 200 one Regional Course and 18 hours of upper-division geography courses (300, 400, 500 level).

**MINOR: 16 semester hours of geography** including 6 hours of upper-division credit.

**TECHNICAL MINOR:** Geog 382, 383, 483, 484, plus MCom 160, CSc 112 and Stat 341 for a total of 19 hours.

†Electives in the Physical Environment, Cultural Environment, Agricultural Sciences, and Engineering Sciences are available from a departmental list in geography advisers office. Students taking the Environmental Management option should include Geog 337, 338, 339, 447 in their 18 hours of upper-division work in the major.

\*Students taking the Urban and Regional Planning Option should include Geog 454, 461, and 464 in their 18 hours of upper-division coursework in the major.

†Students taking the Technical Geography Option should include Geog 382, 383, 483, 484, 485 and 486 in their 18 hours of upper-division coursework in the major.

**Undergraduate Courses**

**131 Physical Geography I 4(3,2) F**

The earth in terms of its basic physical state. Location, navigation, geodesy, astrogeography, weather and climate.

**132 Physical Geography II 4(3,2) S**

The earth in terms of its basic physical state. Vegetation, soils, landforms and cartography. P, 131.

**200 Intro to Human Geography 3(3,0) FS**

The differentiation of the world. Geographical limitations on human kinds behavior and systems of political and economic life with emphasis in understanding the contemporary culture map of the world.

**210 World Regional Geography 3(3,0) FS**

The differentiation of the world in terms of both natural and human environmental features and characteristics on a regional basis.

**212 Geography of North America 3(3,0) S**

The U.S. and Canada. Physical features and human phenomenon are examined in terms of their contribution to the area.

**219 Geography of S.D. 3(3,0) F**

Physical and human geography of the state, the inter-relationship and significance of various regions within the state and to the U.S.

**310 Soil Geography and Land-use Interpretation 3 or 4(3,0 or 3,2) F**

See Plant Science section. May count toward Geography major.

**313 Geography of Latin America 3(3,0) F**

Natural and geographic regions of Mexico, Central America, Caribbean Islands, and the South American Republics. The human factor and its reaction to the conditions of environment.

**314 Geography of the U.S.S.R. 3(3,0) S**

Appraisal of the physical resource base of Russia and estimates of industrial and agricultural strengths.

**315 Geography of Europe 3(3,0) F**

Regional and topical analysis of the geography of western Europe. Special concentration on the British Isles, Northern Europe, Low Countries, France and Mediterranean Europe.

**316 Geography of Asia 3(3,0) F**

Asian nations, physical and cultural environments, their role in world relations.

**317 Geography of Africa 3(3,0) S**

Major natural regions of the African Continent of emerging nations. Activities and customs of the native tribes and how they have responded to European influences. Africa's position as a storehouse of raw materials.

**337 Atmospheric Sciences 3(3,0) FS**

Systematic methodological investigation of the meteorological elements (weather, climate, altitude, etc.) and their effects on geographic features.

**338 Astrogeography 2(2,0) FS**

Planet Earth; its position, form and size; movements; latitude, longitude, and time; relation of the moon; the seasons; the calendar; the planets, stars, galaxies; universe.

**339 The Earth's Landforms 2(2,0) FS**

Surface features. Continental landforms with their flood-plains, deltas, lacustrine, glaciers, coastal plains, marshes and dunes. One's relations to these landforms will be emphasized.

**351 Economic Geography 3(3,0) F or S**

World wide distribution of economic activities and their physical bases. Agriculture, mining and manufacturing industries and their important commercial products and role in world trade.

**363 Rural Geography 3(3,0) F or S**

Character of American countryside as shaped by private and public decision-making processes. Case studies of major U.S. and European rural planning efforts to understand the present landscape and the problems of rural populations.

**365 Settlement & Land Inventory Analysis 3(3,0) F or S**

Geographical patterns of human occupation, land tenure, land division and land usage. Emphasis on North America and the Upper Midwest. Significance of these patterns in environmental, resource utilization and land use planning. P, 200 or 212 or 219.

**382 Geographic Research Methods 3(3,0) F or S**

General methods of geographic research. Includes library research, interviews, data collection, analysis, observation. Development of a research topic, methods of investigation and preparation of a research paper.

**383 Cartography 3(3,0) FS**

History and principles of cartography. Emphasis on field mapping; map projections; cartographic design; map interpretations; and exercises in map making.

**393 Directed Studies in Selective Topics 1-9 FSSu**

Students interested in studying a certain topic or acquiring a particular skill in which a faculty member is competent but which is not covered by regular courses at SDSU, may undertake a program of directed study. The work will be planned and implemented by the student and the instructor, with department head approval.

**396 Undergraduate Course Specials: (Topical) 1-5 FSSu**

Ten or more students who wish to study a topic in which a faculty member is competent but which is not covered by regular courses at SDSU may propose a special.

**400 Advanced Cultural Geography 3(3,0) F or S**

A detailed analysis of the concept of culture in the geographical context, including such applications as the cultural/technological determinants of the man-land relationship, cultural origins and dispersals, cultural ecology, cultural landscapes, culture change, and culture regions. P, Geog 200.

**425 Population Geography 3(3,0) S**

World population in relation to its distribution within various physical and cultural environments. Particular emphasis is placed on past, present, and future populations of the U.S.

**433 World Crop & Soil Resources 3(3,0) F**

(See plant science section. May count toward Geography major).

**447 Geography of the Future 3(3,0) S**

The world, particularly the U.S. in the year 2000 A.D. Special emphasis on such areas as population, urban life, transportation, food, social and cultural developments and alternative futures.

**454 Industrial & Commercial Site Selection 3(3,0) FS**

Analysis of geographic factors involved in selection of locations and sites for manufacturing, commercial and agricultural enterprises.

**461 Urban Geography 3(3,0) FS**

Geography of cities: types, functions, and distribution of world cities. Special emphasis on planning of cities in the U.S.

**464 Geographic Aspects of Regional Planning 3(3,0) S**

Regional planning with particular reference to the upper Mid-West.

**476 Historical Geography 3(3,0) FS**

Historical periods portrayed against geographical background. May be taken as Hist 476 for History credit.

#### 481 Field Methods in Geography 3(3,0) F

Methods and techniques in studying geography in the field. Map and photo interpretation, reconnaissance mapping, surveying and land use evaluation.

#### 483 Air Photo Interpretation 3(3,0) F

Development of skills and techniques involved in the interpretation of aerial photographs showing physiography, land use, industrial, commercial and military functions. P, Geo 383 or consent.

#### 484 Remote Sensing 3(3,0) S

Applications of remote sensing. Development of remote sensing: Instrumentation; and techniques and methodology that will aid in the determination of need and proper utilization of our physical and cultural resources. P, 483 or consent.

#### 485 Quantitative Methods in Geog 3(3,0) S

Statistical methods and techniques and applications of these in the study of geographic phenomena such as climatic data, population geography, economic geography.

#### 486 Computer Mapping 3(3,0) S

Computer mapping as a tool in the preparation of maps or diagrams and in geographical analysis of maps and diagrams. Will include consideration of various mapping programs. P, Algebra course, and Geo 383 or consent.

#### 487 Geographic Information Systems 3(3,0) FS

GIS as a data base management system for spatial data. Includes application, planning and management. GIS facilitates modeling of natural and cultural resources in a spatial context.

#### 492 Special Problems in Geography 1-2-3-4(1-2-3-4,0) FSSu

Opportunity for qualified students to investigate special problems or carry out independent study under supervision of department staff. Variable credit, may be repeated for up to 12 credits. P, Soph, Jr, or Sr standing and/or consent.

#### 494, 495, 496 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu

You have the opportunity to become involved in an off-campus Cooperative Education or Internship activity which promises to contribute significantly to your education, may enroll for and receive between 3 and 12 credits at the maximum rate of one credit per week. (See course description on page 34 Arts and Science College Section.) P, junior standing.

Students who participate in short tour, exchange, or field study programs off campus may enroll for and receive a total of 1-6 semester hours of credit. In no case will the credit granted exceed one per week nor a total of six. In the case of independent experience, the specific amount of credit to be granted, and the conditions established (projects, etc.) will be set prior to the student's departure, in consultation with the supervising instructor and with the approval of the appropriate department chairperson and dean.

## Graduate Courses

#### 503-603 Evolution of Geographic Thought 2(2,0) F

History and development of geography and its theories, schools of thought and current ideas.

#### 506-606 Seminar in Systematic Geography: (Topical) 1-4 FS

Will deal with one or more aspects of human, economic, physical, population and historical geography or techniques. May be repeated for credit. The specific topic to be studied will change each semester.

#### 520-620 Advanced Regional Studies in Geography: (Topical) 1-4 FS

Selected topics in the regional geography of continents, nations, or states. May be repeated for credit. Specific topic to be studied will change each semester.

#### 560-660 Social Demography 2(2,0) F

(See Sociology 666)

#### 700 Seminar in Geography 1-4

#### 765 Advanced Studies in Land Utilization: (Topical) 1-4 FS

#### 788 Advanced Geographic Techniques: (Topical) 1-4(1-4,0) FS

#### 790 Thesis in Geography: M.S. 1-6

As Arranged.

#### 791 Seminar in Anthropology 1-4

(See Anthropology 791)

#### 792 Special Problems in Geography: (Topical) 1-4

#### 104 Health, Physical Education and Recreation

## Health, Physical Education and Recreation (HPER)

### College of Arts and Science

Professor Forsyth, Head; Professors Blazey, Booher, Williamson, Professor Emeriti Crabbs, Huether, Robinson; Associate Professors Ewing, Marske; Oien, Richardson; Assistant Professors Erickson, Iverson, Lidstone, Moran, Olson; Instructors Allyn, Charlson, Delansky, Dutcher, Ekland, Engels, Haensel, Hoffman, Ireland, Neiber, Thorson, Underwood; Adjunct Professor in Cardiac Rehabilitation, Roberts; Adjunct Professors of Sports Medicine, Billion, Holm, Lushbough, Shaskey, Tesch, Wait.

The program may be divided into four categories. While the four phases are related, each has a unique purpose.

#### Fitness and Lifetime Activities

Two one-credit courses in fitness and lifetime activities are required of all students. The courses are designed to develop intellectual inquiry as to the need of physical activity and to present the opportunity for you to learn skills in carry-over activities to promote physical, social and emotional well being. Two additional one-credit courses may be elected and such credits will count toward graduation. **No activities may be repeated.** Majors and Minors in HPER will substitute the major professional skills courses for the physical education requirement. The following activities are offered under PE 100 for both men and women:

Adaptives, Archery, Badminton, Bait & Fly Casting, Ballet, Basketball, Body Conditioning, Body Mechanics, Bowling, Camping Skills, Cross Country Skiing, Cycling, Dance, Fencing, Ice Skating, Individualized Fitness, Jogging, Karate, Project Adventure, Recreational Activities, Racquetball, Soccer, Social Dance, Softball, Spring Board Diving, Swimming, Synchronized Swimming, Scuba, Tennis, Team Handball, Track & Field, Tumbling, Volleyball, Water Polo, Water Skiing, Weight Training, Wrestling.

Opportunities for learning Fitness & Lifetime Activities at an advanced level are offered under PE 200, for both men and women. These offerings may not be substituted for the PE 100 required courses.

#### Intramural and Recreational Sports and Sports Clubs

A broad program of Intramural and Recreational Sports are offered to encourage you to continue the development and appreciation of Fitness and Lifetime skills and activities. The program actively involves you in managing, supervising and officiating roles. The Intramural Council, elected women and men representing resident halls, campus organizations, sports clubs and independent groups coordinates a program involving more than 30 sports and activities. Sports Club programs are coordinated through the Intramural Council.

#### Intercollegiate Athletics

SDSU offers intercollegiate athletic competition in eight sports for women and eight sports for men. SDSU is a charter member of the North Central Intercollegiate Athletic Conference and a long-time member of the National Collegiate Athletic Association. Competition for both women and men is governed by both organizations. Women may compete in cross country, indoor track and field, outdoor track and field, volleyball, basketball, swimming, golf and softball. Men may compete in cross country, indoor track and field, outdoor track and field, football, basketball, swimming, wrestling and baseball.

The Athletic, Intramural and Recreation Committee, composed of students, faculty, administrators and alumni, serves in an advisory capacity to the Athletic Director and the President.

## **Professional Preparation in Health, Physical Education and Recreation**

This program includes the undergraduate teaching major in Health, Physical Education and Recreation. Other programs offered are athletic coaching concentration, physical therapy major, public recreation minor, health education minor, dance education minor, physical education minor, athletic training minor, and graduate Health, Physical Education, and Recreation. Proficiency in a variety of physical education skills is required. All majors must pass a physical fitness proficiency test. A professional uniform is required of all major and minor students.

### **Course Cross Referencing**

The department cross references courses with other consenting departments within the university. Students may use the prefix of the course which is most advantageous to their desired preparation. The course description contains a statement referring to the course with which it is cross referenced.

### **Health, Physical Education & Recreation Major**

You may earn either a Bachelor of Arts or a Bachelor of Science degree by completing the curriculum outlined on the following pages. Since these curricula are designed primarily for persons who plan to enter the teaching field, you are urged to choose elective courses which will qualify you to teach courses in academic fields as well as in physical education. (See suggested minors in teacher education fields under the Education Department.) A student with a GPA of 2.2 or better may petition the head of HPER Department to graduate with a non-teaching major.

To teach in S.D. you must also meet certification standards established by the Division of Education, Pierre, South Dakota.

The department screening committee must approve all students desiring to begin professional preparation in Health, Physical Education and Recreation. This committee reviews yearly the academic progress of departmental students at the end of each semester and recommends probation status or termination where necessary.

### **Public Recreation Major**

The B.A. or B.S. Degree may be earned by completing the curriculum outlined on the following pages. Programs are based on an interdisciplinary approach providing a broad, comprehensive background for leadership and administrative roles in the recreation profession. All students transferring into the Public Recreation major from within the university or from another institution will be evaluated on an individual basis by a departmental screening committee. Transfer students must have a 2 point GPA to be accepted into the Public Recreation major program. Transfer students with less than a 2 point GPA may petition for approval. If accepted, the transfer student will enter on probation for one semester. A Public Recreation major must have a 2.4 cumulative GPA to be recommended for the required 8-week internship experience. Four options are available for intensive study in the major: Agency, Commercial, Outdoor and Therapeutic.

### **Public Recreation Minor**

A minor may be earned by completing 22 semester hours within departmental offerings. The following courses are required: Recr 230, 241, 360, 370, 440, PR 201, and PE 121. Recreation minor students will be counseled in selecting eight semester hours of course work from the suggested elective list.

### **Dance Education Minor: (Danc)**

24 hours must be completed for the minor. 18 hours in Dance Education are required plus 6 hours of elected courses in the related fields of music, theater, and art. Speech, Art, and Music majors must take the six elected courses in subjects other than their majors. Certain dance courses are offered on alternate years. (See course descriptions.) The coordinator of dance education will aid students in the use of variable credit courses and in the choice of electives necessary for completion of the dance minor.

### **Athletic Training Minor**

A program devised to provide students majoring in any area the opportunity to become more competent in athletic training. Administrators of school systems at all levels are searching for qualified

personnel to aid in this phase of health care for their students participating in athletic, intramural and recreational activities.

Courses required for completion of the athletic training minor include: Zool 221, NFS 111, HPER 351, 352, 354, 360, 361, 362, 363, 364, 450, 454, and HPER 482 or Zool 325, Psyc 101, Hlth 102 or 212, and one additional psychology course. The completion of the athletic training minor will qualify students to take the certification examination given by the National Athletic Trainers Association.

Students interested in completing the athletic training minor must submit an application for permission to enroll in course work in this area to the coordinator of athletic training prior to attaining junior status.

### **Athletic Coaching Concentration**

Some states, among them S.D., Ia., and Mn., have a specific requirement for athletic coaching certification in public schools. Students interested in seeking certification for coaching should consult with the Undergraduate Coordinator in the Department of HPER in order to determine the specific requirements for each state.

The Department of HPER recommends that additional course work be taken beyond the certification requirements to be better prepared as a coach. The following courses are recommended: PE 354, HPER 440, PE 351, PE 450, Zool 221. In addition, four semester hours are recommended in PE 470.

This coaching concentration is not recognized by the SDSU HPER Department as adequate preparation for the teaching of Physical Education.

### **Elementary Physical Education Concentration**

Students desiring endorsement in Elementary Physical Education must complete the following courses: PE 359, PE 360, Danc 130, Danc 131, Danc 132, CDFR 211, HPER 482, SeEd 287, Hlth 212, Hlth 360, SeEd 591, HPER-Selected Skill Block Courses.

### **Health Education Minor (Hlth)**

Students interested in preparing to teach health education may secure a strong minor by completing a minimum 29 semester hours in HPER, Health Education and related fields.

Required courses are Hlth 102, 212, 369, 443, 463 or 469; CDFR 211; NFS 321; Soc 250 or 382 plus a seminar in Drug and Alcohol Abuse. Nine hours must be completed from among the biological sciences, including Anatomy and Physiology, Bio 151, 153, Zool 123, 221, 325 and HPER 450.

### **Physical Education Minor**

A minor may be earned by completing 21 semester hours within departmental offerings. The following courses are required: PE 352, 460, 359 or 360, HLTH 159 or 360 plus five hours from the activity classes of PE 131, 132, 230, 231, 232, 331, 332, Danc 130.

In addition, a student minoring in Physical Education must complete a total of eight hours from the following courses: HPER 240, 440, 451, PE 320, 342, 351, 450, Danc 131, 230.

All students interested in a minor in Physical Education must obtain approval from the Coordinator of Undergraduate HPER.

### **Adult Fitness & Cardiac Rehabilitation Concentration**

This program is designed to prepare students for the internship and examinations required for certification as an Exercise Leader by the American College of Sports Medicine. Certified Exercise Leaders may serve in this capacity in programs of cardiac rehabilitation, intervention and prevention. Courses required include: Dance 130; Hlth 159 or 360; PE 230, 320, 332, 351, 450; Psyc 101; HPER 482 (Seminar in Methods and Materials in the Conduct of Adult Fitness and Cardiac Rehabilitation Programs).

### **Physical Therapy Major**

A program designed to prepare students to enter a professional curriculum in Physical Therapy. The department provides counseling service to assist each student in developing a plan best suited to his or her needs. Acceptance by physical therapy schools is on a competitive basis; therefore a strong undergraduate academic

record is essential. Students may prepare themselves in Physical Therapy by pursuing one of the following options.

**OPTION 1:** Students complete a Bachelor's degree from this institution, including the pre-physical therapy requirements, and then attend an approved physical therapy school to earn a certificate in physical therapy.

**OPTION 2:** Complete three years at this institution of a curriculum to be prescribed and earn a certificate from an approved school of physical therapy. Upon receiving this physical therapy certificate, the student will also receive 36 credit hours toward a Bachelor's degree from this institution with a major in physical therapy.

**OPTION 3:** Complete the pre-physical therapy requirements at this university and then transfer to a School of Physical Therapy.

### Pre-Occupational Therapy Option

A program designed to prepare students to enter a professional curriculum in Occupational Therapy. Students must complete the Pre-Occupational Therapy requirements before applying to a School of Occupational Therapy. The department provides counseling service to assist each student.

### Graduate Programs

A graduate program leading to the Master of Science degree is offered in Health, Physical Education and Recreation. See Graduate Bulletin for details.

### Curriculum in Arts and Science Health, Physical Education and Recreation Major

Leading to the Bachelor of Arts degree

	F	S	Credit
<b>Freshman Year</b>			
Fr Comp, Engl 101.....	3	or	3
Mathematics electives.....	3	or	3
Fund of Speech, SpCm 101.....	3	or	3
Foreign Language.....	4		4
Prin & History of HPER, HPER 2403.....	3	or	3
*Skills, PE 131 or 132 or 230 or 231 or 232 or 330 or 331 or 332.....	1		1
Recreational Leadership, Recr 360 or Recr 241 Intro. to Pub. Rec.....	2	or	2
Community Health, Hlth 102 or Contemp Health Problems, Hlth 212.....	2	or	2
Fund of Dance, Dance 130.....	1	or	1
Swimming, PE 320.....	1	or	1
Humanities, Social Science, or Natural Science electives			
<b>Sophomore Year</b>	F	S	
Gen Psychology, Psyc 101.....	3	or	3
*Skills, PE 131 or 132 or 230 or 231, 232, or 330, or 331, or 332.....	1		2
Anatomy, Zool 221.....	3	or	3
Practicum & Professional Lab Exp, SeEd 287	2	or	2
Movement Experiences for Children, PE 359 or Elementary School Phy Ed, PE 360.....	2	or	2
Foreign Language.....	3		3
Prevention & Care of Athletic Injuries, PE 354.....	2	or	2
Humanities, Social Science, or Natural Science electives			

\*(All skills classes should be completed by the end of the junior year.)

Choose from the following courses a total of 3 credit hours: Dance electives (1-3), Intramural & Recreational Sports Administration, PE 342 (2)

### Junior Year

Same as Bachelor of Science degree curriculum

### Senior Year

Same as Bachelor of Science degree curriculum

### Curriculum in Arts and Science Health, Physical Education and Recreation Major

Leading to the Bachelor of Science degree

	F	S	Credit
<b>Freshman Year</b>			
Fr Comp, Engl 101.....	3	or	3
Fund of Speech, SpCm 101.....	3		3
Intro Biology, Bio 151-153.....	3		3
Prin & History of HPER, HPER 240.....	3	or	3
Mathematics elective.....	3	or	3
*Skills, PE 131 or 132 or 230, or 231 or 232 or 330 or 331 or 332.....	1		1
Community Health, Hlth 102 or Contemp Health Problems, Hlth 212.....	2	or	2
Recreation Leadership, Recr 360 or Recr 241, Intro to Pub. Rec.....	2	or	2
Fund of Dance, Dance 130.....	1	or	1
Swimming, PE 320.....	1	or	1
Humanities & Social Science electives			
<b>Sophomore Year</b>	F	S	
Gen Psychology, Psyc 101.....	3	or	3
*Skills, PE 131 or 132 or 230 or 231 or 232 or 330 or 331 or 332.....	1		2
Anatomy, Zool 221.....	3	or	3
Prevention & Care of Athletic Injuries, PE 354.....	2	or	2
Movement Experiences for Children PE 359 or Elementary School Phys. Ed, PE 360.....	2	or	2
Practicum & Professional Lab Experience, SeEd 287.....	2	or	2
Chem and/or Physics.....	4		4
Humanities & Social Science electives			
<b>Junior Year</b>	F	S	
Junior Comp, Engl 300.....	3	or	3
Ed Psychology, EPsych 302.....	2	or	2
Intro to American Education, EdFn 339.....	2	or	2
Health & Safety Education, Hlth 460 or Methods & Materials of Inst., Hlth 463.....	2	or	3
Kinesiology, PE 351.....	3	or	3
Methods of Teaching, PE 460.....	2	or	2
Adaptive Phys Ed, PE 352.....	2	or	2
Exercise Physiology, PE 450.....	3		3
Organization & Administration of HPER, HPER 440.....			3
Coaching Theory electives.....	2		2
Skills PE 131 or 132 or 230, or 231 or 232 or 330 or 331 or 332.....	1		1
Teaching of Reading, SeEd 450.....	3	or	3
Indian History Course, Hist 368 or Anth421...	3	or	3
<b>Senior Year</b>	F	S	
Prin of Guidance, CGPS 410.....	2	or	2
Methods of Teaching in Secondary Schools, SeEd 400.....	3	or	3
Audio-Visual Methods & Materials, Ed 405.....	2	or	2
Supervised Student Teaching, SeEd 488.....	8	or	8
Tests & Measurements in HPER, HPER 451...	2	or	2

The courses in Health, Physical Education and Recreation are divided into the following areas: Dance (Danc); Health Education (Hlth); Health, Physical Education and Recreation (HPER); Physical Education (PE); Physical Therapy (PT); and Recreation (Recr).

## Dance Education (Danc)

### Undergraduate Courses

#### 120-320 Dance Production Lab 1(0,2)

Added experience in composition and performing techniques. A production (dance concert, studio performance) will be developed each semester. Technical aspects of costuming, lighting, make-up, and promotion of a dance event are included. May be repeated. P, Dance 120 or consent. No more than 6 credits in both 120-320.

#### 130 Fundamental Dance & Rhythms 1(0,3)

Basic skills course required of all physical education majors. Includes analysis and skill development of round, folk, square and social dances, traditional and contemporary.

#### 131 Creative Dance for Children 2(1,1) F

Theory and laboratory class considering how creative movement experiences meet special needs of children. Emphasis on problem solving approach. Consideration given to developmental stages of children, basic elements of dance, teaching methods, structuring a lesson plan, and presenting it.

#### 132 Recreations and International Folk Dance 1(0,2)

Folk dances from around the world, including cultural background, costumes, skill differences for elementary, middle and high school or adults.

#### 230 Modern Dance I 1(0,2)

Techniques, composition and appreciation of modern dance.

#### 231 Modern Dance II 1(0,2)

Continued technical development plus consideration of movement quality as affected by time, space and energy. P, Danc 230. (Alt. even years)

#### 240 Dance Composition 2(1,2) S

Theory and practice of elements of dance composition both as a choreographer and as a member of a group. Includes consideration of aesthetic principles of form, as well as old and new methods of composition. Emphasis is on problem solving and self-discovery. P, Dance 230. (Alt. odd years)

#### 330 Dance Forms 2(1,2) S

Laboratory experience in theatrical forms of dance not included in other courses. Will include units in ballet, jazz, ethnic and tap dance. (Alt. even years)

#### 340 History and Theory of Dance 2(2,0) S

Intensive study of dance history, theory and philosophy. (Alt. even years)

#### 385 Directed Studies 1-5

See HPER 491

#### 420 Techniques of Teaching Dance 2(1,2) S

Theory and practice of teaching the various dance forms: social, square, folk, modern, rhythmic games, creative dance for children. Experience in lesson planning. Unit and general curriculum requirements K-12. P, Danc 130, 132, 230. (Alt. odd years)

#### 485 Undergraduate Course Specials 1-5

See HPER 491.

#### 492 Problems in Dance 1-3

See HPER 491.

#### 494-495-496 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu

See HPER 494

### Graduate Course

#### 581-681 Workshops in Dance Ed 1-3

See HPER 581-681.

## Health Education (Hlth)

All courses listed with the Hlth prefix are cross-referenced with the same number in the Health Science Department (HSc) with that prefix.

### Undergraduate Courses

#### 102 Community Health 2(2,0) FS

See HSc 102

#### 141 Intro to the Health Profession 2(2,0) F

See HSc 141

#### 159 Emergency Medical Care 2(2,1)

To develop or upgrade the skill levels of individuals involved in emergency medical care services. Introduction to basic anatomy, physiology and emergency medical care for students planning a career in the health sciences.

#### 212 Contemporary Health Problems 2(2,0) FS

See HSc 212

#### 252 Disaster Preparedness 1(1,0) FS

See HSc 252

#### 260 Standard First Aid — Instructor 1(1,1)

First aid knowledge and skills necessary to care for most injuries, to meet most emergencies and also provides accident prevention information. You will receive the Instructor Training Course which will qualify you to teach the Standard First Aid and Personal Safety Course.

#### 261 Instructor's Course in Home Nursing 1 S

See HSc 261

#### 302 Family Health 2(2,0) S

See HSc 302

#### 360 Advanced First Aid — Emergency Care 2(2,1)

Instruction for those who are in a position to provide first aid and emergency care frequently. Provides essential knowledge and skills needed to develop the functional first aid capabilities required by nurses, teachers, athletic trainers, crisis team personnel, policemen, firemen, emergency squad and rescue squad members, ambulance attendants, and other special interest groups. You must be 18 or older.

#### 385 Directed Studies 1-9

See HPER 491

#### 432 Occupational Health 2(2,0) FS

See HSc 432

#### 440 Epidemiology 3(3,0) S

See HSc 440

#### 443 Public Health Services 3(3,0) FS

See HSc 443

#### 460 Health & Safety Education 2(2,0) F

Curriculum content at elementary and secondary levels. Methods of presentation including direct, correlated, and integrated health instruction. Organization of health and safety education. P, junior standing.

#### 463 Methods & Materials in Health Education 3(2,3) FS

See HSc 463

#### 485 Undergraduate Course Specials 1-5

See HPER 491

#### 491 Problems in Health Education

See HPER 491

#### 494-495-496 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu

See HPER 494

## Graduate Courses

#### 550-650 Safety Education 2(2,0)

Curriculum planning and methods of presentation in the field of safety education.

#### 581-681 Workshops in Health 1-3

See HPER 681

#### 760 Advanced Administration of School Health Programs 2(2,0) FSu 1987

Methods of health instruction; problems of health service; problems in supervision of health environment; recent trends in safety education. P, graduate standing, permission of staff.

## Health, Physical Education & Recreation (HPER) Major Theory Courses

### Undergraduate Courses

#### 240 Prin & History of HPER 3(3,0) FS

Aims and objectives of physical education. Biological, sociological, psychological, mechanical, and historical foundations.

#### 440 Organization & Administration of HPER 3(3,0) S

Curricula, intramural and athletic programs. Administration of facilities, equipment and budgets. P, junior standing.

#### 451 Tests & Measurements in HPER 2(2,1) FS

Place of measurement in physical education. Analytical survey of tests and measures available; statistical approach, techniques and procedures in planning and administering tests and measurements. P, junior standing.

#### 482 Senior Seminar 2 credits

Reports, group discussion. Required of recreation majors. P, senior standing or permission.

#### 485 Undergraduate Course Specials 1-5

See description under Undergraduate Course Specials in the Alternatives and Options for the College of Arts and Science.

#### 491 Directed Studies 1-9

See description under Directed Studies Program in the Alternatives and Options for the College of Arts and Science.

#### 492 Problems in HPER 1-3 FS

Directed studies and/or research activities related to HPER. P, consent.

494-495-496 Cooperative Education/Internship/Field Experience 1-12 3(3,0) FS

See description in College of Arts & Sciences.

## Graduate Courses

581-681 Workshops in HPER 1-3

Lectures, conferences, committee work, and outside assignments to increase understanding of a specific area. P, junior standing, consent.

582-682 Seminars in HPER 2(2,0) FSSu

P, graduate standing, permission of staff.

741 Philosophy of Physical Education and Recreation 3(3,0)

742 Psycho-Social Aspects of Sports 2(2,0)

743 Basic Issues in HPER 3(3,0)

744 Supervision of Health, Physical Education and Recreation 2(2,0)

751 Advanced Evaluation in HPER 3(3,0)

760 Motor Learning & Development 3(2,2)

783 Research Methods in HPER 3(3,0)

790 Thesis in HPER 5-7 as arranged

792 Individual Research & Study in HPER 1-4 credits FSSu

## Physical Education (PE) Men and Women

### Undergraduate Courses

100 Fitness & Lifetime Activities 1(0,2) FSSu

Activities stressing individual, team and physical fitness according to student needs and interests.

121 Swimmer Swimming 1(0,2) FSSu

Water safety and the nine basic swimming strokes. P, pass qualifying swimming test. May not substitute for PE 100.

200 Fitness & Lifetime Activities (Intermediate) 1(0,2) FSSu

Advanced instruction in courses such as golf, tennis, and archery. Theory and practice of such activities. May not substitute for PE 100.

223 Synchronized Swimming 1(0,2) FSSu

Basic skills, methods, materials and techniques for teaching and coaching synchronized swimming. May not substitute for PE 100.

320 Advanced Life Saving 1(0,2) FSSu

Basic skills, knowledge, attitudes and conditions of life saving. Participation may lead to American Red Cross Senior Life Saving certification. P, pass qualifying swimming test. May not substitute for PE 100.

321 Water Safety Instructor Part I & II 2(1,2) FSSu

Method of instruction and evaluation of water safety techniques. Participation may lead to American Red Cross Water Safety instructor's certification Part I and II. May not substitute for PE 100. P, PE 320 or current Red Cross Life Saving Certificate.

322 Water Safety Instructor of the Handicapped 1(0,2) FSSu

Method of instruction and evaluation of water safety techniques for the atypical. May lead to the American Red Cross Water Safety Instructor's certification. May not substitute for PE 100. P, 321, or current Water Safety Instructor certificate.

342 Intramural & Recreational Sports Administration 2(2,0) F

Organization and administration of intramural sports on elementary, secondary and college levels. Program planning, facilities, equipment and financing of intramural sports program. P, sophomore standing.

351 Kinesiology 3(3,0) FSSu

Mechanics and muscular actions related to movement of the human body. P, Zool 221 or 325, junior standing.

352 Adaptive Phys Ed 2(2,0) FS

Principles and techniques involved in use of exercise for prevention and improvement of functional defects.

354 Prevention & Care of Athletic Injuries 2(2,1) FS

General care and treatment of athletic injuries, conditioning and training, equipment of training room, taping for athletic injuries.

359 Movement Experiences for Children 2(2,1) S

Needs, characteristics, and capacities of primary children (grades K-3); curriculum planning, methods and materials essential to program development in movement education rhythms, games and self-testing activities.

360 Elementary School Phys Ed 2(2,1) F

Needs, characteristics, capacities of elementary school children (grades 4-6); curriculum planning; organizational problems; and methods, and materials essential to program progression in movement exploration, dance games, self-testing. P, sophomore standing.

450 Exercise Physiology 3(2,2) FSSu

Body processes and exercise; efficiency of muscular, work, fatigue and exercise; age, sex and body type as related to exercise; nervous control of muscular activity; effect of exercise on the circulatory system. P, junior standing.

460 Methods of Teaching Phys Ed 2(2,0) FS

Curriculum planning, principles of motor learning, methods used in teaching various activities in physical education. P, junior standing.

491 Directed Studies 1-9

See HPER 491

494-495-496 Cooperative Education/Internship/Field Experience Topical 1-12 FSSu

See HPER 494-495-496

## Coaching of Interschool Athletics

Sectionized courses in coaching of football, basketball, field hockey, volleyball, cross country, track and field, gymnastics, swimming, wrestling, tennis, baseball, softball, and golf.

470 Coaching & Officiating of Athletics 2(2,1)

Theory and practice of individual fundamentals and team strategies. Organization and management procedures specific to each sport. Textbook work, lectures, visual aids, demonstrations. Techniques of officiating. P, junior standing.

## Professional Skills for Majors

131-332 Professional Skills 1(0,2) FS

Majors are given adequate preparation in performing activities essential to teaching Physical Education. Proficiency in performance and knowledge of each skill will be examined. All classes are co-ed.

131 Softball, Basketball

132 Track and Field, Racquet Sports

230 Recreational Activities, Golf

231 Field Sports, Volleyball

232 Wrestling, Archery

330 Soccer, Bowling

331 Tumbling, Weight Training 2(0-4)

332 Tennis, Individualized Fitness Danc 130 Fundamentals of Dance

## Graduate Courses

560-660 Methods & Materials for Elementary Phys Ed 2(2,0) Su

Analysis of activities, materials, techniques and methods used in physical education for elementary grades. Progression in curriculum planning in areas of dance, games, self-testing, and movement exploration. P, graduate standing.

581-681 Aquatics Workshop 1-3

Specific areas, lectures, conferences, committee work, and outside assignments to increase understanding of a specific area in aquatics. May not substitute for PE 100. P, junior standing and consent.

750 Applied Exercise Physiology 3(3,0)

770 Advanced Administration of Interschool Athletics 2(2,0) Su

771 Current Trends in Athletics 3(2,2) Su

## Physical Therapy (PT)

### Undergraduate Courses

102 Community Health 2(2,0) FS

See HSc 102

142 Intro of Physical Therapy 1(1,0) F

Acquaints the beginning major student with all aspects of the profession of physical therapy.

212 Contemporary Health Problems 2(2,0) FS

See HSc 212

260 Standard First Aid — Instructor 1(1,1)

See Hlth 260

322 Water Safety Instructor of the Handicapped 1(0,2)

See PE 322

351 Kinesiology 3(3,0) FS

See PE 351

352 Adaptive Phys Ed 2(2,0) FS

See PE 352

354 Prevention & Care of Athletic Injuries 2(2,1) FSSu

See PE 354

**360 Advanced First Aid — Emergency Care 2(2,1)**

See Hlth 360

**361 Athletic Training Techniques I (Fall Sports) 2(1,4) F**

Lectures, problem conferences, demonstrations, and practical athletic training experiences. Learning, practicing, and applying athletic training techniques related to preventive, protective, and emergency care measure for athletic participants. Practical experience gained by assisting in all varsity sports athletic training programs for women and men. P, PT 354 and consent.

**362 Athletic Training Techniques II (Spring Sports) 2(1,4) S**

See PT 361. P, PT 354 and consent.

**363 Athletic Training — Clinical Experiences I 2(1,4) F**

Provides lecture, demonstrations and practical application to give student trainers experience in evaluating and caring for athletic injuries; setting up conditioning programs; and supervising the athletic training responsibilities for various sports. P, PT 354 and consent.

**364 Athletic Training — Clinical Experiences II 2(1,4) S**

See HPER/PT 363. P, PT 354 and consent.

**450 Exercise Physiology 3(2,2) FSSu**

See PE 450

**451 Tests & Measurements in HPER 2(2,1) FS**

See HPER 451

**454 Medical Aspects of Athletic Training 2(2,1)**

Specific problems relative to medical aspects of athletic training. Injury examination techniques, treatment modalities and techniques, therapeutic exercises, rehabilitation of injured athletes, athletic nutrition, doctor-trainer-coach relationships, budgeting and administration of an athletic training program. P, 361, 362, 363 or 364 and consent.

**491 Directed Studies 1-9**

See HPER 491

**494-495-496 Cooperative Education/Internship/Field Experience 1-12**

hours FSSu

See HPER 494-495-496

**Graduate Courses****581-681 Workshops in HPER 1-3**

See HPER 681

**582-682 Seminars 2(2,0)**

See HPER 682

**790 Thesis 1-7 as arranged**

See HPER 797

**792 Individual Research & Study 1-4 credits FSSu**

See HPER 792

**Recreation (Recr)****Undergraduate Courses****230 Professional Skills 1(0,2) FS**

See Professional Skills for Majors

**241 Intro to Public Recreation 2(2,0) F**

Historical background of recreation and use of leisure time. The Recreation and Park movement, governmental responsibilities and current trends will be stressed.

**330 Therapeutic Recreation 2(3,0) F (every other year)**

Theoretical and philosophical foundations of therapeutic recreation, behavioral, therapeutic use of activity; recreative interaction-intervention techniques; survey of major services and agencies. P, junior or senior standing, Recr 241.

**341 Outdoor Recreation 2(2,0) S**

Development of outdoor recreation ethic, its history, philosophy, leaders, and the justification, allocation and distribution of natural resources for recreation.

**342 Intramural & Recreational Sports Administration**

Organization and Administration of Intramural and Recreational Sports Activities, emphasis on planning, schedule structuring and promotion. P, sophomore standing.

**350 Sailing and Canoeing 2(2,2) F**

Water Safety Techniques related to small craft. Basic skills and techniques important in the recreational use of canoes, sail boats, outboard boating, and rowing. P, Recr. 121.

**351 Recreation Facilities 2(2,0) S (every other year)**

An introduction to the principles and practices of planning, financing, management and maintenance of recreation facilities. P, junior or senior standing, PE 121.

**360 Recreation Leadership 2(2,0) S**

Philosophy and interpretations of leadership as it relates to recreation in a democratic society.

**370 Camp Administration & Camp Counseling 3(2,2) F**

Administration of recreational camps and counseling of camp participants. Equipment, staff, budget, facilities, supervision, and leadership. P, junior or senior standing, Recr 241.

**440 Community Recreation 3(3,0) S**

Organization and administration of community recreation, program planning and recreational program areas. P, junior or senior standing, Recr 241.

**482 Senior Seminar 2 credits**

See HPER 482

**485 Undergraduate Course Specials 1-5**

See HPER 485

**491 Directed Studies 1-9**

See HPER 491

**492 Problems in Recreation 1-3**

See HPER 491

**494-495-496 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu**

See HPER 494-495-496

**Graduate Courses****581-681 Aquatics Workshop 1-3**

See PE 681

**740 Recreation and Leisure in American Society 2(2,0) Su****Curriculum in Arts and Science****Public Recreation Major**

Leading to the Bachelor of Science Degree

**Freshman Year**

	F	S	Credit
Fr Comp, Engl 101 .....	3	or	3
Intro Biology, Bio 151, 153 .....	3		3
Intro to Public Rec, Recr 241 .....	2		
Algebra, Math 111 .....	3	or	3
Rec Activities & Golf, Recr 230 .....	1	or	1
Fund of Dance, Dance 130 .....	1	or	1
Fund of Speech, SpCm 101 .....	3	or	3
Rec Leadership, Recr 360 .....			2
Individual & the Family, CDFR 141 .....	2	or	2
Music Appreciation, Mus 100 .....	2	or	2
Programming with BASIC, CSC 112 .....	2	or	2
Fitness & Lifetime Activities, PE 100 .....	1		1
Design Fundamentals, Arts 123 .....	3		
Humanities, Social Science electives			

**Sophomore Year**

	F	S	Credit
Intramural & Rec Sports Adm, PE/Recr 3422			
Intro to Sociology, Soc 100 .....	3	or	3
Park Adm & Organization, PR 201 .....	3		
Macroeconomics, Econ 201 .....	3	or	3
Tennis & Individual Fitness, PE 332 .....	1	or	1
Swimmer Swimming, PE 121 .....	1	or	1
Gen Psychology, Psyc 101 .....	3	or	3
Intro to Philosophy, Phil 205 .....	4	or	4
Physical Geography, Geog 131 .....	4	or	4
General Chemistry, Chem 110 .....	4	or	4
Social Problems, Soc 150 .....	2	or	2
Humanities, Social Science elective			

**Junior Year**

	F	S	Credit
Junior Comp, Engl 300 .....	3	or	3
Public Speaking, SpCm 315 .....	3	or	3
or			
Oral Interpretation, SPCM 330 .....	3	or	3
Outdoor Rec, Recr 341 .....	2	or	2
Environmental Conservation, WL 210 .....	2	or	2
Camp Adm & Counseling, Recr 370 .....	3		
Business Law I, B-Ad 350 .....	3	or	3
Advanced First-Aid-Emergency Care, Hlth			
360 .....	2	or	2
Directed Studies/Recreation Crafts, Recr 385 ..	2	or	2



Community Recreation, Recr 440.....		3	
Problems in Recreation, Recr 491.....	3		3
Suggested Electives			
<b>Senior Year</b>	<b>F</b>		<b>S</b>
State & Local Government, PolS 210.....	3		3
Stagecraft, Thea 141.....	3	or	3
Publicity Methods, MCom 313.....	2	or	2
Sailing and Canoeing, Recr 350.....	2		
Sr Seminar in Rec, HPER 482.....			2
Field Experience & Student Internship, Recr 494.....	8	or	8
Suggested Electives			

**Curriculum in Arts and Science**  
**Public Recreation Major**  
 Leading to the Bachelor of Arts Degree

<b>Freshman Year</b>	<b>F</b>		<b>S</b>
Fr Comp, Engl 101.....	3	or	3
Foreign Language.....	4		4
Intro to Public Rec, Recr 241.....	3		3
Rec Activities & Golf, Recr 230.....	1	or	1
Fund of Dance, Danc 130.....	1	or	1
Fund of Speech, SpCm 101.....	3	or	3
Rec Leadership, Recr 360.....			2
Microcomputer BASIC and Literacy, CSc 112	2		2
Individual & the Family, CDFR 141.....	2	or	2
Music Appreciation, Mus 100.....	1	or	1
Math Elective.....	3	or	3
Fitness & Lifetime Activities, PE 100.....	1		1
Design Fundamentals, ArtS 122.....	3	or	3
Humanities, Social Science & Natural Science electives			

<b>Sophomore Year</b>	<b>F</b>		<b>S</b>
Intramural & Rec Sports Adm, PE/Recr 342	2		2
Intro to Sociology, Soc 100.....	3	or	3
Park Adm & Organ., PR 201.....	3		3
Macroeconomics, Econ 201.....	3	or	3
Tennis & Individual Fitness, PE 332.....	1	or	1
Swimmer Swimming, PE 121.....	1	or	1
Social Problems, Soc 150.....	2	or	2
Gen Psychology, Psc 101.....	3	or	3
Intro to Philosophy, Phil 205.....	4	or	4
Foreign Language.....	3		3
Natural Science electives.....	4		4

**Junior Year**  
 Same as Bachelor of Science degree curriculum.

**Senior Year**  
 Same as Bachelor of Science degree curriculum.

## Health Science (HSc)

### College of Nursing

Professor Blazey, head; Professor Michalewicz

The Public Health Science curriculum provides training in administration, community health education, food sanitation and environmental health. Successful completion of the program leads to a Bachelor of Science degree.

The training programs are designed to provide sufficient flexibility to move into many career areas. The student with this degree may pursue graduate work in the same or a related field.

The curriculum uses courses from throughout the university which provide a broad, comprehensive background in technical fields and in communication skills, humanities, and social sciences.

A Health Science minor is offered for those who wish to obtain competencies in health knowledge, health services and healthful environment, by completing 18 semester hours including CDFR 211 and 342; HSc 102, 212, Hlth 360, HSc 432, 443, and 463 and nine hours of biological science. All minors must consult the head of the Health Science Department for approval.

**Curriculum in Public Health Science**  
 Required Courses Leading to the Bachelor of Science degree

			<b>Credit</b>	
			<b>F</b>	<b>S</b>
<b>Freshman Year</b>				
Algebra, Math 111.....				3
Biology, Bio 151.....	3			
Fr Comp, Engl 101.....	3			
Intro to Sociology, Soc 100.....	3			
Gen Chem, Chem 110 or 112.....	4			
Gen Chem, Chem 114 (115-1 cr).....				4
Community Health, HSc 102.....	2			
Fund of Speech, SpCm 101.....	3			
Intro to the Health Professions, HSc 141.....				2
Fitness & Lifetime Activities, PE 100.....	1			1
*Non-technical electives.....	1			3
<b>Sophomore Year</b>			<b>F</b>	<b>S</b>
Gen Microbiology, Micr 231.....	4			
***Elementary Physics I-II, Phys 111, 113.....	4			4
General Entomology, PS 305.....	3			
**Elementary Organic Chem, Chem 120.....				4
Comtemp Health Problems, HSc 212.....	2			
Macroeconomics Principles, Econ 201.....				3
Gen Psychology, Psc 101.....				3
*Non-technical electives.....	4			3
<b>Junior Year</b>			<b>F</b>	<b>S</b>
Junior Comp, Engl 300.....	3			
Statistical Methods I, Stat 341.....	3			
Human Nutrition, NFS 321.....	3			
Environmental Microbiology, Micr 310.....				4
Methods & Materials of Health Instruction, HSc 463.....	3			
Technical Electives.....	5			5
*Non-technical electives.....				4
<b>Senior Year</b>			<b>F</b>	<b>S</b>
Public Health Science, HSc 443.....	3			
Occupational Health, HSc 432.....	2			
Epidemiology, HSc 440.....				3
Pathogenic Microbiology, Micr 423.....	4			
Immunology, Micr 442.....				4
***Cooperative Education, Internship, Field Experience, HSc 494-495-496.....				1-2
Technical Electives.....	8			6

\*15 credits of non-technical electives of which 9 semester credits will be in the social sciences and 6 semester hours in the humanities selected from the representative list.  
 \*\*Chem 326-328 Organic Chemistry is recommended for students planning to take graduate work.  
 \*\*\*Four semester hours required for community health emphasis.  
 \*\*\*\*CSc 112 may be substituted for Physics 113.

<b>Suggested Technical Electives</b>	<b>Credits</b>
Am Government Issues & Policies, PolS 204.....	3
Anatomy, Zool 221.....	2
Audio-Visual Methods & Materials, SeEd 405.....	2
Business Law I, B-Ad 350.....	3
Business Law II, B-Ad 351.....	3
Dairy Foods, DS 231.....	3
Dairy Microbiology, DS 301.....	3
Drug, Alcohol & Tobacco Workshop, HPER 492.....	2
Educational Measurement, EdEr 415.....	2
Elementary Biochem, Chem 260.....	4
Emergency Medical Care, Hlth 159.....	2
Environmental Chem, CE 380.....	3

Environmental Engineering, CE 523.....	3
Food Microbiology, Micro 311.....	3
Fund of Organic Chem, Chem 224.....	4
Gen Parasitology, Zool 467.....	3
Genetics, Bio 371.....	3
Household Pest Control, PS 191.....	2
Human Development & Personality, CDFR 211.....	2
Individualized Fitness, PE 332.....	1
Industrial Waste Treatment, CE 524.....	2
Institutional Organization & Management, NFS 391.....	2
Insects Affecting Man and Animals, PS 393.....	3
Newswriting, MCom 210.....	3
Physiological Chem, Chem 364.....	4
Prin of Accounting I, Actg 210.....	3
Prin of Accounting II, Actg 211.....	3
Prin of Guidance, CGPS 412.....	2
Public Administration, PolS 320.....	3
Quantitative Analysis, Chem 232.....	4
Seminar, Death & Dying, HSc 442.....	1-4
Seminar, Health Planning, HSc 442.....	1-4
Seminar, Perspectives in Aging, HSc 442.....	1-4
Senior Seminar in Health Education, HPER 482.....	2
Social Psychology, Psyc 441.....	3

## Undergraduate Courses

### 102 Community Health 2(2,0) FS

Emphasis on knowledge, attitudes and behaviors utilized in solving community health problems.

### 141 Introduction to the Health Professions 2(2,0) F

Composite of health professions, including functions, responsibilities and effect upon society. Emphasis on medical- nursing- dentistry- environmental-pharmacy and other allied health professions. Open to all students in health science and other health related fields.

### 212 Contemporary Health Problems 2(2,0) FS

Health problems men & women will encounter as a community member. Open to all students.

### 252 Disaster Preparedness 2(2,0) FS

Basic philosophy, fundamental principles of civil defense; citizen's role in emergency planning for non-military national defense. Open to all students.

### 261 Instructor's Course in Home Nursing 1 S

Workshop of 36 hours in effective methods of teaching home care of the sick. Limited to 14 students. P, consent.

### 302 Family Health 2(2,0) S

Planning for promotion of family health. Open to all students.

### 432 Occupational Health 2(2,0) FS

(On sufficient demand) Industrial hygiene and environmental sanitation; influence of occupation upon health, legal regulation, inspection and control, union health services, size and scope of modern industrial health program, application of public health principles and medical nursing and engineering practice to places of employment, relationship to community health program. P, junior or senior.

### 440 Epidemiology 3(3,0) F

(On sufficient demand) Basic principles applicable to infectious and non-infectious disease; host-agent-environment complex; the factors influencing programs for their prevention and control. P, HSc 102 or HSc 212, consent and senior standing.

### 442 Seminar (1-4)

Current research and studies emphasizing Public Health terminology, study of reports, and problems. Open to advanced students in Health Science and other health related fields.

### 443 Public Health Science 3(3,0) FS

Organization and administration of public and voluntary health agencies. Principle functions and program development in vital statistics, maternal-child health, adult health, sanitation, health education, and special health programs. Problem solving in fields of public health. Junior or senior standing. Open to upper division professional majors in health related fields.

### 452 Workshop 1-4

### 463 Methods & Materials in Health Instruction 3(2,3) FS

Observation and participation in various classroom techniques, preparation of unit and lesson plans, evaluation of participants and students and review of current source material. P, HSc 212, Psyc 101, 9 hours of biological sciences.

## 494-495-496 Cooperative Education/Internship/Field Experience 1-12 FSSu

Planned and supervised professional experience related to health science which takes place outside the formal classroom with private business, industry, or public agencies. P, consent of department program coordinator.

## History (Hist)

### College of Arts and Science

Professor Bell, head; Professors Crain, Funchion, Miller, Sweeney; Professor Emeritus Volstorff; Assistant Professor Berg

History courses, in addition to their inherent cultural-intellectual value, are designed to give majors a necessary background for advanced graduate work, professional training in law, teaching, or government service. The department's offerings in History are also intended to meet the needs of students majoring in the social sciences and the humanities and to serve the general education interests of the entire academic community.

The History courses are grouped into two major areas — the U.S. and Europe. Courses are also offered in numerous other areas, such as Latin America and Russia to provide added enrichment to the program. It is suggested that history majors orient their upper division course work in either the American or European concentrations. Students who expect to teach American History must take 8 hours of American History in order to qualify for the S.D. teaching certificate.

#### Curriculum in Arts and Science, History Major Leading to the Bachelor of Arts Degree

	CREDITS
Fr Comp, Engl 101 & Jr Comp, Engl 300.....	6
Fund of Speech, SpCm 101.....	3
Mathematics.....	3
Fitness and Lifetime Activities, PE 100.....	2
Natural Sciences (2 disciplines).....	8
Social Sciences.....	12
Humanities.....	6
Foreign Language.....	14
History Major: Three of the following four courses: Hist 121(3), 122(3), 251(3), 252(3); and 20 upper division credits in history to include Hist 380(2).....	29
Electives (including 23 credits for prospective teachers).....	45
	128

#### Curriculum in Arts and Science, History Major Leading to the Bachelor of Science Degree

	CREDITS
Fr Comp, Engl 101 & Jr Comp, Engl 300.....	6
Fund of Speech, SpCm 101.....	3
Fitness & Lifetime Activities, PE 100.....	2
Mathematics.....	3
Biological Science.....	6
Physical Science.....	8
Social Sciences.....	12
Humanities.....	9
History major: Three of the following four courses: Hist 121(3), 122(3), 251(3), 252(3); and 20 upper division credits in history to include Hist 380(2).....	29
Electives (including 23 credits for prospective teachers).....	51
	128

Students should refer to the university graduation requirements and College of Arts and Science graduation requirements for additional specific requirements. These are listed elsewhere in the catalog.

**MINOR IN HISTORY:** Three of the following four courses: Hist 121 (3), 122 (3), 251 (3), 252 (3); and nine additional credits, of which 6 must be in upper division courses. Total: 18 credit hours.  
**NO GRADE BELOW A "C" IN HISTORY COURSES WILL BE COUNTED FOR A HISTORY MAJOR OR MINOR.**

## Undergraduate Courses

### 121 History of Western Civilization to 1650 3(3,0) FS

Introduction to the major developments, events, personalities in western civilization from prehistoric times through the Reformation.

### 122 History of Western Civilization since 1650 3(3,0) FS

Survey of western civilization from the Reformation to the present.

### 251 U.S. History to 1877 3(3,0) FS

Consideration of main themes, events and personalities in American history from beginning to 1877, using political, social and economic perspectives.

### 252 U.S. History since 1877 3(3,0) FS

Consideration of main themes, events and personalities in American history from 1877 to present, using political, social and economic perspectives.

### 260 American Military History 3(3,0)

A study of the art and science of military affairs as practiced by the United States. Includes an analysis of the part the armed forces play within American society. The relation between the armed forces and other government agencies will also be examined from the colonial period to the present.

### 265 History of the American West 3(3,0)

From exploration and colonization of North American continent through closing of the frontier. Includes routes of migration, cattle frontier, mining frontier, Indians, pioneer farmers, mechanized farming, urban frontier, and the effect of the frontier on the American character.

### 310 Topics in Latin American History 3(3,0)

A semester-long examination of a special topic in Latin American history. Topics include but are not limited to: Mexico; 20th Century Latin American Social Revolutions; Latin American Indian Civilizations; and U.S.-Latin American Relations.

### 311 History of the Far East 3(3,0)

Emphasis on penetration of European powers in the area during the 18th-19th centuries, and roles of Far Eastern nations in world politics in 20th century.

### 313 The Near East 3(3,0)

Social, economic, cultural and political institutions of the Arab and Moslem world, with stress on relations of Near Eastern nations with the great colonial powers of the West. The period covered is primarily the 18th, 19th and 20th centuries.

### 322 Ancient History 3(3,0)

Greece and Rome. Emphasis on Greek culture and Athenian democracy, the rise and failure of the Roman Republic, the development and collapse of the Roman Empire; and the emergence of the Christian Church.

### 325 Medieval Europe 3(3,0)

Western Europe from 300-1400 A.D. Role of the church, feudalism, revival of cities, commercial revolution, rise of universities, development of nation states.

### 326 Renaissance & Reformation 3(3,0)

Political, social, economic, cultural, and religious changes in Europe from 1300 to 1600.

### 327 Early Modern Europe 3(3,0)

Europe from the Treaty of Westphalia to the French Revolution. The Age of Louis XIV, the Age of Reason, and the French Revolution. Social, economic, cultural and political forces of the 17th and 18th centuries that helped shape the modern world.

### 330 Topics in European History 3(3,0)

A semester-long examination of a special topic in modern European history. Topics include, but are not limited to: Scandinavia; Soviet Russia; Nazi Germany; Spain and Portugal; Ireland; Christianity and the Roman Empire; Republics in Western Civilization.

### 341-342 English History 3(3,0) FS

341 covers Roman Britain to 1688; 342 traces the political and cultural history of the British Isles and the Empire from 1688 to the present.

### 345 History of Russia 3(3,0)

From the earliest times to present, with emphasis on background and history of Communist regime. Treats cultural and social as well as political aspects.

### 350 Colonial History of the U.S. 3(3,0)

Establishment of the British colonial empire in North America, settlement of the 13 colonies and the growth of the British American colonies to the end of the French and Indian Wars.

### 352 Revolutionary & Early National Period in U.S. History, 1763-1800 3(3,0)

Causes of the American Revolution, War for Independence, Articles of Confederation, Constitutional Convention of 1787, establishment of the Federal Union and early years of the Republic.

### 354 The Age of Jefferson and Jackson, 1800-1840 3(3,0)

Jefferson's administration, War of 1812, Jackson's administration.

### 355 Civil War & Reconstruction, 1840-1877 3(3,0)

Development of ante-bellum South; social, political, and economic factors leading up to outbreak of the Civil War; Reconstruction period and problems of the post war South.

### 356 The New Nationalism, 1877-1920 3(3,0)

Examination of political, economic, social, and cultural developments in the U.S. from 1877-1920. Emphasis on urban and industrial growth, reform movements, imperialism, war.

### 357 American Between The Wars, 1918-1941 3(3,0)

Major political, social, economic, and cultural developments in the U.S. during the crucial decades of the 1920s, 1930s.

### 358 The U.S. Since 1941 3(3,0)

Social, economic, and political change. The consequences, domestic and foreign, of global power and rising affluence.

### 360 Topics in American History 3(3,0)

A semester-long examination of a special topic in American history. Topics include, but are not limited to: Immigration; The Family; Urban American; Future Foreign Policy; America in the 1920s; Depression and New Deal.

### 368 History of the American Indians 3(3,0)

American Indian history. Emphasis on the origins and early distribution of North American Indian cultures, the history of Indian-white contacts, the impact of federal Indian policy, persistence and change in American Indian cultures. (Satisfies the Teacher Preparation Program requirement of 3 credits of American Indian Studies.)

### 373 History of Rural America 3(3,0)

Development of American agriculture and rural life. Emphasis on the midwest experience. Topics include: government and railroad land policies; agricultural frontier and early settlement patterns; frontier crops; challenge of the prairie; impact of technical innovation, rural cooperatives, government agricultural policies and foreign markets; changing patterns of rural culture, politics and landscapes.

### 376 History of S.D. 3(3,0)

The land, people, and institutions of the state.

### 377 Economic History of the U.S. 3(3,0) F

Emphasis on economic factors but also correlated political and social developments, colonial period to present.

### 380 Methods & Philosophy of History 2(2,0) S

How historians research and write history. Also an account of attempts to explain larger meaning and directions of history. P, junior standing, required of majors.

### 393 Directed Studies in Selective Topics 1-9 FSSu

If you are interested in studying a certain topic or acquiring a particular skill in which a faculty member is competent but which is not covered by regular courses at SDSU, you may undertake a program of directed study. The work will be planned and implemented by you and the instructor, with department head approval.

### 394 Field Experience: (Topical) 1-6 FSSu

See Arts and Science section.

### 396 Undergraduate Course Specials: (Topical) 1-5 FSSu

See Arts and Science section.

### 417-418 History of Latin America 3(3,0)

417, Native Indian populations of Latin America, colonization of the area by European powers, and general history of Latin America up to and including the wars of independence. 418 is a study of the national development of Mexico, Argentina, Chile, Brazil and Cuba in the 19th and 20th centuries.

### 421-422 Contemporary European History 3(3,0)

421 deals with Europe from 1919 to 1945, and 422 with Europe from 1945 to the present. Topics will include: the failure of the League of Nations, the rise of Fascism and Nazism, Communism, WW II, the Cold War, the UN, NATO, the Common Market, and political, economic, and cultural developments on the continent.

### 447 Modern Germany 3(3,0)

Examination of German history in the 19th and 20th centuries. Emphasis on the formation of the German nation, Bismarck, development of the German empire, WW I, rise of Hitler, Nazi Germany and WW II.

**461-462 Constitutional History of the U.S.** 3(3,0)

American constitutional and legal history from colonial times to the present. Relationship between the law and the social, economic, and political systems of society.

**467 American Diplomatic History** 3(3,0)

Detailed and interpretive analysis of American diplomatic history from 1492-1980.

**476 Historical Geography** 3(3,0)

See Geog 476. May be used to satisfy history major with approval of department head.

**492 Special Problems in History** 1-2-3-4(1-2-3-4,0) FSSu

Opportunity for qualified students to investigate special problems or carry out independent study under supervision of department staff. Variable credit, may be repeated for up to 8 credits. P, Soph, Jr or Sr standing and consent.

**494-495-496 Cooperative Education/Internship/Field Experience (Topical)** 1-12 FSSu

Planned and supervised professional experience related to history which takes place outside the formal classroom with private business or industry, or public agencies.

**Graduate Courses**

**538-638 European Intellectual History** 3(3,0)

History of literature and the arts, leading cultural and ideological movements of Western man from the Renaissance to the present.

**541-641 Europe in the 19th Century** 3(3,0)

Europe, 1815-1914. The emerging power struggle in 19th Century Europe, the race for world empire, forces leading up to the outbreak of WW I and scientific, cultural and artistic achievements of the age.

**560-660 Topics in History** 2-4

An intensive examination of significant 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.

**568-668 American Diplomacy Since 1945** 3(3,0)

Detailed and interpretive analysis of American diplomatic history since 1945.

**571-671 & 572-672 Cultural History of U.S.** 3(3,0)

Development of American society and culture; changes in values, ideas, beliefs, institutions, behavior, arts, leisure, and material culture.

**591-691 Conflicting Interpretations of American History** 3(3,0)

Analysis of questions of historical interpretations in the field of U.S. history which are currently being debated by scholars.

**592-692 Special Problems in History** 1-3 FSSu

Selected studies for advanced students.

**793 Seminar in History** 1-3

**Home Economics Education (HE, HEd)**

**College of Home Economics**

Professor Anderson, Head; Professor Gilbert, Emeritus; Associate Professor Kluckman; Assistant Professors Bell, Farris, Kurtz; Instructor Brands.

Three majors are available in and administered by the Home Economics Education Department: Home Economics Education, Home Economics Extension and Home Economics Journalism. The department is accredited by the American Home Economics Association and the National Council for Accreditation of Teacher Education. It is approved by the Division of Vocational and Technical Education of the South Dakota Department of Education and Cultural Affairs. During the senior year, all majors participate in off-campus programs. Home economics education majors teach consumer homemaking and/or related occupations in public schools and take part in school and community activities. Home economics extension majors spend time working in a county extension office under the supervision of a County Home economist. Home economics journalism majors have an internship including supervised media experience. All majors are encouraged to belong to EJE, the departmental club for majors in Home Economics Extension, Journalism and Education.

A grade of "C" or above must be earned in required courses to be eligible for graduation with a major in Home Economics Education, Extension or Journalism. Journalism majors must also meet minimum credit hour requirements set by the Journalism Department.

You should see your adviser for other admission and certification requirements.

The minor in the Home Economics Education Department is in Home Management and Consumer Studies. No minor is available in Home Economics Education or Home Economics Extension. The Home Management and Consumer Studies Minor consists of the following required 16 credits: HE 241, Management in Family & Personal Living (3 cr.); HE 391, Consumers & the Market (3 cr.); HEd 401, Seminar - Consumer Issues (2 cr.); HEd 421, Experiences in Adult Education (2 cr.); and at least 6 credits from the following: HE 102, Managing Family Resources (2 cr.); HEd 130, Consumer Education (2 cr.); HEd 340, Work, Time and Energy Decisions (3 cr.); HE 442, Family Resource Management Lab (1-3 cr.); HE 361, Home Equipment (2 cr.).

**Home Economics Education**

**Freshman Year**

Career Exploration, HEd 101 ..... 1
Family Development, CDFR 101 ..... 2
Field Experience, HE 101 ..... 1
Managing Family Resources, HE 102 ..... 2
Nutrition and the Family, NFS 101 ..... 2
Clothing and the Family, TC 101 ..... 1
Housing and the Family, ID 102 ..... 1
Foods: Principles, NFS 141 ..... 4
Clothing Construction Principles, TC 112 ..... 2
Freshman Composition, Engl 101 ..... 3
Fundamentals of Speech, SpCm 101 ..... 3
General Chemistry, Chem 110 (or higher) ..... 4
General Psychology, Psy 101 ..... 3
Math Elective ..... 3

32

**Sophomore Year**

Human Development & Personality I: Childhood, CDFR 211 ..... 3
Experience in Human Relations, CDFR 271 ..... 3
Practicum in Occupational Teacher Education, HEd 331 ..... 1
Special Topics, Early Experience, HEd 493 ..... 1
Management in Family & Personal Living, HE 241 ..... 3
†Approved Humanities Electives ..... 6
†Approved Natural Science Elective ..... 4
†Approved Social Science Elective ..... 3
NFS Electives ..... 3
ID Electives ..... 3
Fitness & Lifetime Activities, PE 100 ..... 2

32

**Junior Year**

Human Development & Personality II: Adolescence, CDFR 312 ..... 2
Survey of Nutrition or Human Nutrition, NFS 221 or 321 ..... 3
Dynamics of Family Development or Problems in
Family Relations, CDFR 342 or 443 ..... 3
Practicum in Occupational Teacher Education, HEd 331 ..... 2
Home Equipment, HE 361 ..... 2
Consumers & the Market, HE 391 ..... 3
Textiles, TC 242 ..... 3
Family Housing, ID 331 or Shelter and Families, ID 450 ..... 3
Junior Composition, Engl 300 ..... 3
Educational Psychology, EdPsy 302 ..... 2
Indians of North America or History of the American Indians,
Anth 461 or Hist 368 ..... 3
†Computers in Teaching, EdFn 385 ..... 2

31

<b>Senior Year</b>	
Philosophy and Methods, HEd 411.....	3
Preparation for Student Teaching and Extension Practicum, HEd 412.....	5
Supervised Student Teaching in Home Economics, HEd 473.....	8
Family Resource Management Lab, HE 442.....	3
Socio-Psychological Clothing Aspects, TC 413 or Dress & Adornment in World Cultures, TC 350.....	3
Principles of Vocational Education and Practical Arts, VTTE 405.....	2
Teaching of Reading, SeEd 450.....	3
†Elective.....	3
‡Approved Social Science Elective.....	3

†Use of these credits to develop a teaching minor is strongly recommended.  
‡Must be university and department approved; can be used to develop a teaching minor.

## Home Economics Extension

Students wishing to work with the Cooperative Extension Service as extension home economists or area specialists will find this major provides the professional preparation needed.

### Freshman Year

Family Development, CDFR 101.....	2
Nutrition & the Family, NFS 101.....	2
Field Experience, HE 101.....	1
Managing Family Resources, HE 102.....	2
Clothing & the Family, TC 101.....	1
Housing & the Family, ID 102.....	1
Career Exploration, HEd 101.....	1
Freshman Composition, Engl 101.....	3
Fundamentals of Speech, SpCm 101.....	3
General Psychology, Psy 101.....	3
Math Elective.....	3
Fitness & Lifetime Activities, PE 100.....	2
General Chemistry, Chem 110 (or higher).....	4
Foods: Principles, NFS 141.....	4

32

### Sophomore Year

Clothing Construction Principles, TC 112.....	2
Textiles, TC 242.....	3
Introduction to Interior Design, ID 221.....	3
Household Pest Control, PS 191.....	2
‡Approved Natural Science Elective.....	4
Human Development & Personality I: Childhood, CDFR 211.....	3
Management in Family & Personal Living, HE 241.....	3
‡Approved Social Science Electives.....	6
‡Approved Humanities Electives.....	6

32

### Junior Year

Human Development & Personality III: The Middle & Later Years, CDFR 313.....	2
Home Equipment, HE 361.....	2
Consumers & the Market, HE 391.....	3
Survey of Nutrition or Human Nutrition, NFS 221 or 321.....	3
Family Housing, ID 331 or Shelter & Families, ID 450.....	3
Junior Composition, Engl 300.....	3
Public Administration, PolS 320.....	3
Educational Psychology, EdPsy 302.....	2
NFS Elective.....	3
CSc Elective.....	2
CDFR Electives.....	6

32

<b>Senior Year</b>	
Publicity Methods, MCom 313.....	2
Family Resource Management Lab, HE 442.....	3
Supervised Extension Experiences, HE 482.....	8
Philosophy & Methods, HEd 411.....	3
Preparation for Student Teaching & Extension Internship, HEd 412.....	5
TC or ID Electives.....	3
†Electives.....	8

32

†Use of these credits to develop a secondary strength is strongly recommended.  
‡Must be University and Department approved; can be used to develop secondary strength.

## Home Economics Journalism

This major is intended to prepare home economics students for journalism positions with businesses, government agencies, newspapers, magazines, radio and television, universities and other organizations which require persons with a combined knowledge of journalism and home economics. The courses provide training in newspaper and magazine reporting and editing, broadcast journalism, advertising and mass communication law.

In order to graduate, you must complete at least 16 credit hours in one of the following areas of Home Economics: 1) Child Development, 2) Nutrition and Food Science, 3) Textiles and Clothing, 4) Interior Design, 5) Home Management & Consumer Studies.

Two to four credits in MCom 413 are required. They may be taken either semester or in summer session as 'Intern' work on a newspaper, magazine, or broadcasting station with approval of department head. Not more than 38 nor less than 30 credits may be taken in Journalism.

### Freshman Year

Career Exploration, HEd 101.....	1
Clothing & the Family, TC 101.....	1
Family Development, CDFR 101.....	2
Field Experience, HE 101.....	1
Fitness & Lifetime Activities, PE 100.....	2
Freshman Composition, Engl 101 or 191.....	3
Fundamentals of Speech, SpCm 101.....	3
Housing & the Family, ID 102.....	1
Managing Family Resources, HE 102.....	2
Nutrition & the Family, NFS 101.....	2
Mathematics Elective.....	3
‡Natural Science Elective.....	8
‡Social Science Elective.....	3

32

### Sophomore Year

Newsriting, MCom 210.....	3
HE Ed electives.....	3
‡Humanities Elective.....	3
Interior Design Elective.....	3
Nutrition & Food Science Elective.....	2
‡Social Science Electives.....	6
Textiles & Clothing Elective.....	3
University core.....	5

32

### Junior Year

Consumers & the Market, HE 391.....	3
Junior Composition, Engl 300.....	3
Newspaper Editing, MCom 310.....	2
Newspaper Editing, MCom 311.....	1
Principles of Advertising, MCom 370.....	3
Home Economics Electives.....	6
Journalism electives.....	6
Electives.....	8

32

<b>Senior Year</b>	
Internship, MCom 495 or HE 495.....	2-4
Mass Communications Law, MCom 414.....	3
Philosophy & Methods or Experience in Adult Education, HEd 411 or 421 .....	2-3
Home Economics Electives .....	9
†Journalism Electives .....	5-9
†Electives, including 5 credits of University core.....	8-13

†Not more than 38 or less than 30 credits may be taken in journalism.  
‡Must be university and department approved.

## Home Economics (HE)

### Undergraduate Courses

- 101 Field Experiences 1 Cr. FS**  
Participation in community experience during the freshman and sophomore year. Observations involving work ethics, interpersonal relations and use of resources. Focus on effective communication in the community. Course graded either "E" or "F". (Concurrent with CDFR 101, TC 101, ID 102, NFS 101, HE 102 or concurrent with CDFR 101 and HE 102.)
- 102 Managing Family Resources 2(2,0) FS**  
Resource management related to individual and family values, goals and decision-making throughout the family life cycle. Emphasis on non-money resources. (Concurrent with CDFR 101, TC 101, ID 102, NFS 101, HE 101 or concurrent with CDFR 101, HE 101.)
- 241 Management in Family and Personal Living 3(3,0) FS**  
Resource management related to the economic aspects of family decision-making.
- 361 Home Equipment 2(1,2) S**  
Selection, principles of operation, use and care of household equipment.
- 391 & Econ 391 Consumers & the Market 3(3,0) FS**  
Factors important to families as purchasing agents and consumers; information, advertising; consumer practices affecting cost; analysis of programs for consumer protection; the market structure. Principles of maximization of consumer satisfaction. P, junior standing or consent.
- 422 Family Resource Management Lab 1-3 Cr. FS**  
Application of management concepts as related to families of varying structures and conditions. Experiences designed to meet individual professional needs. Recommended for junior/senior level, following completion of all 100/200 level required courses. Can be taken concurrently with 1-3 credits of HE 492. Reservations and special fees required.
- 482 Supervised Extension Experiences 8 Cr, FS**  
Working under supervision in a county extension office. The role of the extension home economist, organization and philosophy of the Cooperative Extension Service, public relations, use of mass media, program development and teaching in extension with both youth and adults. Full-time residence in a county seat town. P, 2.6, HEd 412 and Senior standing or consent.
- 492 Special Problems 1-3 FS**  
Problems selected according to students' special needs and interests. Taken concurrently with HE 442. One of the following emphases may be selected:  
Child Development and Family Relations  
Nutrition and Food Science  
Home Management and Consumer Studies  
Home Economics Education  
Home Economics Extension  
Home Economics Journalism  
Textiles and Clothing  
Interior Design
- 494-495-496 Professional Practicum 1-12 Cr. FSSu** Working under supervision with business concern. Role of home economist in business, company organization and ethics, public relations, use of mass media, special aspects of particular business. P, consent.

### Graduate Courses

- 500-600 Practicum in Home Economics Related Occupations 2-6 cr.**  
**501-601 Seminar 2 cr.**  
**573-673 Special Problems 1-4 P, consent.**  
**701 Seminar in Home Economics 0.5-2**

- 790 Thesis 5-7 cr.**  
**791 Research Methods in Home Economics 3 cr.**  
**792 Problems in Home Economics 2 cr.**  
**793 Individual Research and Study 5-7 cr.**  
**794 Graduate Internship 5-7 cr.**

## Home Economics Education (HEd)

### Undergraduate Courses

- 101 Career Exploration 1(1,0) FS**  
Discussion and analysis of selected careers in Home Economics. Role of education of career development.
- 130 Consumer Education (2,0) FS**  
Principles of consumer education and application for individual use and practice. Product knowledge needed for competent purchasing. Open to all students.
- 331 Practicum in Occupational Teacher Education 3 FS**  
A practicum in work experience (1 credit) and subject matter preparation (2 credits) to develop competencies desirable for teaching occupational programs.
- 340 Work, Time and Energy Decisions (3,0)S**  
Study and evaluation of decision making in relation to specific time, energy and work patterns. Relationship of household production and consumption decisions to outside employment. Impact of decisions on present and future. Investigation of relevant work-time-energy and decision making theory and research.
- 401 Seminar 1-3(1-3,0) FS**  
Current issues of concern in home economics. Investigation of topics for which there is a particular and current need but not offered as part of any class. P, consent.
- 411 Philosophy & Methods 3(3,0) FS**  
Philosophy and objectives in home economics related to general and vocational education and to home extension. Methods of instruction, selection and use of resource materials, observation and experience with instructional techniques. Must be taken semester immediately preceding HEd 412, EdPsy 302. P, 2.5 GPA, Ed Psy 302.
- 412 Preparation for Student Teaching & Extension Practicum 5, FS**  
First Part Semester  
Planning and developing instruction for various types of home economics programs to meet the needs of selected age groups in structured situations. P, HEd 411, EPsyc 302 and 2.6 GPA.
- 421 Experiences in Adult Education 2(2,0) S**  
Background and trends in teaching adults. Observing, organizing and implementing instructional techniques. Open to all majors.
- 473 Supervised Student Teaching in Home Economics 8 FS Part of Semester**  
Roles and responsibilities of the vocational home economics teacher. Teaching under supervision in at least two subject areas of home economics in an approved school. P, 412, a 2.6 GPA and senior standing in home economics.
- 493 Special Topics in Home Economics Education 1-3(0,3) FSSu**  
For persons needing additional experience or study in a particular aspect of the educator's role. P, consent of instructor. 1 credit, Special Topics, Early Experience, must be taken as a sophomore.
- 494 Special Topics in Home Economics Education 1-3(0,3) FSSu**  
For persons needing additional experience or study in a particular aspect of the educator's role. P, consent of instructor. 1 cr. Sp. Topics, Early Experience, must be taken as a sophomore.
- 494-495-496 Cooperative Education/Internship/Field Experience 1-12 FSSu**  
Working under supervision in an approved experience. Number of credits dependent on experience and supervisory arrangements. P, consent of department and instructor.

### Graduate Courses

- 573-673 Special Problems 1-4 cr.**  
**701 Trends in Home Economics Education 2(2,0) cr.**  
**702 Seminar in Home Economics Education 1-2 cr.**  
**711 History and Philosophy of Home Economics 2 cr.**  
**741 Supervision in Home Economics Education 2(2,0) cr.**  
**743 Special Topics 1-3 cr.**  
**751 Curriculum in Home Economics Education 2(2,0) cr.**  
**761 Evaluation in Home Economics Education 2(2,0) cr.**

# Honors Program (HON)

Allen Branum, Director; Jerry Yarbrough, Arts and Science; Gary Omodt, Pharmacy; Delores Kluckman, Home Economics; Gary Steinley, Education; Robert Todd, Agriculture and Biological Sciences; Les Christianson, Engineering; Beth Hanson, Nursing.

## Purpose

1. To promote excellence in scholarship.
2. To promote intellectual self-reliance, self motivation, initiative, and creativity.
3. To develop the unique personal potential of highly capable individual students.
4. To enable students to develop in-depth understanding of the human experience through interdisciplinary study and independent investigation.

Participation in the Honors Program is to be included within a student's regular program of study in a chosen major. It is a set of courses and independent study which will provide students with the opportunity to develop unique personal potential for excellence. Students who complete the Honors Program will graduate with special Honors Program distinction. The diploma will have affixed to it a seal indicating completion of the Program and the student's transcript will also indicate completion of the Honors Program.

## Program Requirements

The following are the requirements for graduation with the Honors Program distinction.

1. A minimum of 16 credits obtained as follows:
  - a. A minimum of 12 credits from Honors courses of which at least 6 credits must be from Honors Colloquia.
  - b. Completion of an Honors independent study project for a minimum of 4 credits.
2. Attainment of a cumulative GPA of 3.25 or higher.

## Honors Courses

Courses in the Honors Program are divided into three categories as follows:

### 1. The Honors Colloquia

All Honors Program students are required to take at least 6 credits of Honors Colloquia and are encouraged to take more. The colloquia are semester-long interdisciplinary seminars with reading lists, lectures, discussions, examinations, and/or papers. There are four Honors Colloquia - Honors 301, History of Ideas; Honors 302, The Arts; Honors 303, The Social Sciences; and Honors 304, History and/or Philosophy of Science. The colloquia may be used to satisfy core requirement electives for the bachelor's degree and may be taken in any sequence. The colloquia may each be repeated once as the topic and reading lists change.

### 2. The Departmental Honors Courses

Departmental Honors Courses are departmental courses or special sections of departmental courses that have received approval for the Honors Course designation. Credits received from Departmental Honors Course designation. Credits received from Departmental Honors Courses apply toward graduation with the Honors Program distinction. Enrollment is limited to qualified students (see enrollment requirements).

### 3. Independent Study

In the junior year, Honors Program students should begin their independent study projects. A minimum of 4 credits must be earned in this activity under Honors 492. The project shall be evaluated by a three-member committee consisting of one member from the Honors Program Committee and at least one of the remaining members from the area of

study. The student will work out in conference with the evaluation committee a program related to her or his particular intellectual curiosity and professional goals. An undergraduate thesis, oral or written examinations, demonstrations, performances, publications, etc. may provide objective data for evaluation.

## ENROLLMENT REQUIREMENTS FOR HONORS COURSES

Qualified students may enroll in Honors Courses (Departmental Honors Courses or Honors Colloquia) without making formal application to the Honors Program Committee. In order to qualify for enrollment in an Honors Course a student must have a cumulative GPA of 3.0 or higher. Students entering as freshmen, must rank in the upper 10% of their graduating class or have a score on the composite ACT or combined SAT at the 90th percentile.

## APPLICATION FOR GRADUATING WITH HONORS PROGRAM DISTINCTION

Students wishing to graduate with Honors Program distinction must submit an application to the Honors Program Committee before proceeding with their Honors independent study. The application must outline the student's plan for fulfilling all Honors Program requirements and must include a description of the student's proposed Honors independent student project. The application should be approved by the Honors Program Committee before the student registers for the independent study.

## Honors Colloquia

**301 Honors Colloquium 1-4(1-4,0) FS**

History of ideas. May be repeated once.

**302 Honors Colloquium 1-4(1-4,0) FS**

The Arts. May be repeated once.

**303 Honors Colloquium 1-4(1-4,0) FS**

The Social Sciences. May be repeated once.

**304 Honors Colloquium 1-4(1-4,0) FS**

History and/or Philosophy of Science. May be repeated once.

## Independent Study

**492 Honors Independent Study 1-6 FSSu**

Creative work in student's area of interest subject to approval by the Honors Program Committee.

## Horticulture, Forestry, Landscape and Parks (Ho, F, La, PR)

### College of Agriculture and Biological Sciences

Associate Professor Warner, head; Professor Peterson, Prashar; Professor Emeritus Collins; Associate Professors Helwig, Johnson, Martin; Assistant Professors Baer, Passineau, Schaefer, Spinski; Instructors Evers, Waples; Assistant Enevoldsen.

The department offers instruction leading to the Bachelor of Science degree with majors in Horticulture, Landscape Design, and Park Management. The department also offers a two-year curriculum in Pre-Forestry after which students transfer to another school to complete their forestry training. Courses are offered in Horticulture (Ho), Landscape Design (La), Park Management (PR), and Pre-Forestry (F).

### Horticulture (Ho)

The program for students majoring in horticulture is designed for those who plan to work in nurseries; flower, vegetable or fruit

production; processing; plant inspection; sales; plant breeding; garden center operations and various other related fields. The specialized teaching option prepares you for teaching vocational horticulture at the secondary, post secondary and adult levels. Curriculum variations are in business and science options. Extensive research plots in woody ornamentals, vegetables, fruit and herbaceous ornamentals and greenhouse facilities provide valuable teaching aids.

### Curriculum in Agriculture, Horticulture Major

Leading to the Bachelor of Science Degree

	F	S
<b>Freshman Year***</b>		
Fr Comp, Engl 101.....	3	or 3
Fitness & Lifetime Activities, PE 100.....	1	1
Fund of Speech, SpCm 101.....	3	or 3
Gen Chem, Chem 110 or 112-114.....		4
Intro Biology, Bio 151.....	3	
Botany: Structure and Function, Bot 200.....		3
Gen Horticulture, Ho 111.....	3	or 3
Gen Psychology, Psyc 101.....	3	or 3
Algebra, Math 111.....	3	
Soils, PS 113.....	3	or 3
Work Experience, Ho 496** (Summer).....	(2)	
<b>Sophomore Year***</b>	F	S
Plant Pathology, PS 223.....	3	
Macroeconomic Principles, Econ 201.....	3	
Floral Design, Ho 213.....	3	
Horticultural Insects, PS 295.....	3	
Introductory Physics, Phys 101.....		4
Vegetable Growing, Ho 212.....	3	
Elementary Organic Chem, Chem 120.....		4
Turf Management, Ho 211.....		3
Intro to Sociology, Soc 100.....		3
Work Experience, Ho 496*** (Summer).....	(2)	
Electives*.....	2	
<b>Junior &amp; Senior Years***</b>	F	S
Woody Plants, Ho 313.....	4	
Landscape Design I, La 321.....	3	
Seminar, Ho 470.....	1	
Junior Comp, Engl 300.....	3	
Prin of Accounting I, Actg 210.....		3
Genetics, Bio 371.....		3
Arboriculture, Ho 413.....		3
Technical Communications, Engl 303.....		3
Plant Propagation, Ho 312.....		3
Herbaceous Plants, Ho 311.....	3	
Greenhouse Management, Ho 412.....		3
Fruit Production, Ho 411.....	3	
Plant Physiology, Bot 427.....	4	
Diseases of Horticultural Crops, PS 333.....	3	
Programming with BASIC, CSc 112 or PAS-CAL programming, CSc 114.....	2	
Humanities electives.....	3	3
Work Experience, Ho 496*** (Summer)		
Special electives**.....	3	
Electives*.....	5	5

Transfer students from other colleges must take at least 15 credits approved by the horticulture faculty at SDSU. No grade below C will be accepted toward a major in horticulture.

### \*Horticulture Major Suggested Elective Courses:

Ho 414, Plant Breeding; F231, Dendrology; La 324, Planning Public Grounds; PR 201, Park Administration & Organization; Bot 201, Plant Kingdom; Bot 261, Plant Taxonomy; Bot 415, Plant Ecology; Bot 421, Plant Anatomy; PS 233, Weed Control; PS 323, Soil Fertility & Fertilizers; MA 213, Farm Power & Machinery; MA 333, Soil & Water Mechanics; MA 433, Small Power Equipment; Stat 341, Statistical Methods I; Econ 202, Microeconomic Principles; B-Ad 360, Organization Theory & Management Concepts; F 331, Farm Forestry.

\*\*3 credits to be elected from Ho 414, Plant Breeding; Stat 341, Statistical Methods I; Bot 421, Plant Anatomy; Bot 261, Plant Taxonomy; or PS 323, Soil Fertility & Fertilizers.

\*\*\*Students are required to work two summers or equivalent between the freshman and senior years in horticultural enterprises approved by the department. Each work experience is worth 2 credits.

### Specialized Teaching Option<sup>6</sup>

Students selecting the Teaching Option will follow the Horticulture major curriculum with the following exceptions:

**Delete:** Ho 470, Ho 413, Bot 427

**Add:** AgEd 301, ES 131, VTTE 405, EPsyc 302, AgEd 404, AgEd 434, AgEd 475, AgEd 454, MA 433. Anth 421 or Hist 368, SeEd 450.

<sup>6</sup>Students enrolled in this option must file an application with the Agricultural Education Office prior to enrolling for their junior year or in professional education courses.

### Horticulture Science Option

Students interested in graduate study will follow the Horticulture major curriculum with the following exceptions:

**Delete:** Chem 110; Actg 210.

**Add:** Chem 112, 114, 260; Stat 341; and either Math 111, 120, 121 or Math 113, 123.

### Horticulture Business Option

Students will follow the Horticulture major curriculum with the following exceptions:

**Delete:** Chem 120, Bot 427, 10 cr. Special Electives or electives.

**Add:** B-Ad 360, Econ 202, and elect 12 credits from the following: Actg 211; B-Ad 350, 351, 310; Stat 341; Econ 353, 330, 452.

## Undergraduate Courses

### 111 General Horticulture 3(2,2) FS

Culture and growth processes involved in production of fruit, vegetables, flowers, lawn grasses, trees and shrubs; planning and care of home grounds.

### 211 Turf Management 3(2,2) S

Maintenance and culture of turfgrass for lawns, parks, golf courses, athletic fields and special purpose turf. P, PS 113.

### 212 Vegetable Growing 3(2,2) F

Methods used by home gardeners and commercial growers in vegetable production. P, Ho 111 or PS 103.

### 213 Floral Design 3(1,4) F 1986

Arrangement, care, and handling of fresh and dried flowers. Consent of instructor.

### 311 Herbaceous Plants 3(2,2) F 1987

Identification, description, landscape uses, environmental requirements and adaptability of selected non-woody ornamental plants with emphasis on annuals, perennials and tropical plants. P, Ho 111 or consent.

### 312 Plant Propagation 3(2,2) S 1988

Fundamental anatomical and physiological principles and methods of reproducing herbaceous and woody plants by seeds, cuttings, grafts, layers and division. P, Hort 111 or consent.

### 313 Woody Plants 4(2,4) F

Nomenclature, identification and classification of hardy coniferous and deciduous trees and shrubs, vines, and groundcovers. Landscape use as affected by inherent ornamental qualities, hardiness, environmental factors, and pests.

### 315 Flower Judging 1(0,3) S

Experience in judging cut flowers, flowering potted plants, and foliage plants using standards of Society of American Florists and Pi Alpha Xi. May be repeated for a maximum of 3 credits. P, Ho 111 desirable.

### 411 Fruit Production 3(2,2) F

Fruit production in relation to soils, moisture, temperature, cultivars, rootstocks, pruning, growth regulators. P, Bio 153, Ho 111

### 412 Greenhouse Management 3(2,2) S (1987)

Greenhouse construction, environmental control, production and scheduling of major greenhouse crops. Trips to commercial greenhouse operations and laboratory work in greenhouse crop production. P, Ho 311, Ho 312, and PS 113.

### 413 Arboriculture 3(2,2) S

Shade and ornamental tree planting and care combined with dendrician practices. P, Bot 200, or Ho 313.

### 414 Plant Breeding 3(3,0) S

See Plant Science 443 for course description.

### 470 Seminar 1(1,0) F

Required of all major students; limited to two credits.



**492 Problems 1-2 FS**

Special investigation in horticulture area. Maximum four hours credit. P, consent, research problem 2.7 G.P.A.

**493 Special Topics 1-4 FS**

**494-495-496 Cooperative Education/Professional Internship/Field Experience in Horticulture 1-12 FSSu**

a) Work experience in horticulture. Two credits per semester or equivalent time unit. Consent.

b) Practical experience for selected Horticulture students. The project, program and grading criteria requires approval by the department faculty. P, junior standing and must have completed 2 years of the Horticulture curriculum. Consent. Generally 3 cr. maximum.

**Landscape Design (La)**

Our culture and environment stands in need of the direction and abilities of perceptive designers to improve the environment in which we live. This program leads to a competence to match their desire. Graduates become involved in urban and regional planning, park planning and design of housing, commercial, institutional and industrial sites.

**Curriculum in Agriculture, Landscape Design Major**  
Leading to the Bachelor of Science Degree

**Freshman Year**

Fr Comp, Engl 101.....	F	S
Fitness & Lifetime Activities, PE 100.....	3 or 1	3 or 1
Algebra & Trigonometry, Math 113 or 111-120.....	5-6	
Intro Biology, Bio 151.....	3	
Gen Hort, Ho 111.....	3 or 3	
Engineering Design Graphics, EG 121.....	2	
Gen Chem, Chem 110.....		4
Intro to Sociology, Soc 100.....	3	
Elementary Surveying, CE 106.....		3
Soils, PS 113.....		3

**Sophomore Year**

Intro Physics, Phys 101.....	F	S
Fund of Speech, SpCm 101.....	4	
Woody Plants, Ho 313.....	3	
Engineering Surveys, CE 208.....	4	
Gen Psychology, Psyc 101.....	3	3
Drawing I, ArtS 112.....		3
Architectural Design Drafting, EG 223.....		3
Macroeconomics Principles, 201.....	3	
Technical Sketching, EG 231.....		1
Intro Biology, Bio 153.....		3
Elective*.....		2

**Upper Division**

Students entering the Upper Division must possess and maintain a 2.0 or higher GPA. In the event that a deficiency occurred during the semester immediately preceding entrance into Upper Division the deficiency must be removed in one semester.

**Junior Year**

Junior Comp, Engl 300.....	F	S
Communication Elective, SpCm***.....		3
3-Dimensional Design, ArtS 123.....		3
Landscape Design I, La 321.....	3	
Site Planning, La 322.....	3	
Earthforms, Geo 439.....	2	
Business Law I, B-Ad 350.....		3
Turf Management, Ho 211.....	3	
Landscape Construction, La 323.....		3
Herbaceous Plants, Ho 311.....	3	
History of Arch. & Landscape Arch., La 320.....		3

**Senior Year**

Seminar, Ho 470.....	F	S
Planning Public Grounds, La 324.....	1	
Urban Sociology, Soc 340.....	3	

Intro to Lit, Engl 218.....	3
Graphic Design I, ArtD 231.....	3
State & Local Gov't, PolS 210.....	3
Landscape Design II, La 422.....	3
City Planning, La 421.....	3
Remote Sensing in Geography, Geog 484.....	3
Problem, La 492**.....	2
Group I electives in Ag.....	3
Elective.....	3

\*\*Problems, La 492, (1-4) Students shall select appropriate topics from the following list which correspond to their intended area of specialization or reinforce required courses.

Professional Practice 1-2 Cr.; History of Landscape Architecture, 1-2 Cr.; History of Planning, 1-2 Cr.; History of Architecture, 1-2 Cr.; Design Graphics, 1-2 Cr.; Shades, Shadows, Perspectives, 1 Cr.; Landscape Design, 2,2 Cr.; Planting Design, 2,2 Cr.; Environmental Analysis, 2 Cr.

\*\*\*See approved listing

**\*Suggested electives:**

Students are encouraged to select electives and base their selection upon anticipated area of specialization.

Plant Ecology, Bot 415; Plant Propagation Ho 312; Arboriculture, Ho 414; Design I, ArtS 122; Printmaking ArtS 281; Sculpture I, ArtS 241; Computer Programming, CSc, 212; Geo. Aspects of Reg. Planning, Geo. 464; Introduction to Philosophy, Phil 205; Park Administration & Organization, PR 201; Outdoor Recreation, Resource Management and Interpretation, PR 301.

**Undergraduate Courses**

**320 History of Architecture & Landscape Architecture 3(3,0) S**  
History from early Egyptian to contemporary times. Styles viewed from the standpoint of aesthetic thought, societal and technological influences. Works of Repton, F.L. Wright, Olmsted, Jensen and Sullivan will be stressed. A.Y.

**321 Landscape Design I 3(0,6) F**  
Historical background and theories of landscape design. Solution of aesthetic and functional aspects of residential properties. Prerequisite not required of non-landscape design majors. P, Ho 313, CE 106 or consent.

**322 Site Planning 3(0,6) F**  
Technical work in preparing grading plans, computing areas of cut and fill, site selection, topographic analysis soil and exposure analysis, surface and subsurface drainage and pedestrian and vehicular circulation. P, CE 208.

**323 Landscape Construction 3(0,6) S**  
Design and construction of walks, terraces, fences, masonry walls, pool and landscape accessories. P, La 322. A.Y.

**324 Planning Public Grounds 3(1,4) F**  
Contemporary problems in public properties design such as parks and civic areas. Complexities of functions, pedestrian and vehicular circulation, and land use. Laboratory problems. P, La 321.

**421 City Planning 3(1,4) S**  
City planning in the U.S. Laboratory sessions on new concepts of land use planning. Local planning efforts observed.

**422 Landscape Design II 3(0,6) S**  
Advanced Landscape Design involving contemporary theories, complex problems. P, La 324.

**492 Problems 1-2 FS**  
Special investigations in landscape design. Maximum of 4 hours credit. P, consent.

**493 Special Topics 1-4 FS**  
Special Landscape Architectural topics offered for group study

**494-495-496 Internship/Cooperative Education/Field Experience in Landscape Design 1-12 FSSu**  
See course description under Horticulture curriculum. Generally 3 cr. maximum.

**Park Management (PR)**

The curriculum in Park Management is designed to prepare students for professional positions in parks and recreation. Employment opportunities exist with federal, state, county and municipal

parks and recreation agencies and with private recreation and tourism enterprises. A 2.0 GPA or better is required to transfer into the curriculum and to graduate in park management.

### Curriculum in Agriculture, Park Management Major

Leading to the Bachelor of Science degree

Freshman Year	F	S
Fr Comp, Engl 101.....	3	or 3
Fitness & Lifetime Activities, PE 100.....	1	1
Gen Forestry, F 131 or Gen Hort, Ho 111....	2-3	
Gen Chem, Chem 110.....		4
Intro Biology, Bio 151.....	3	
Algebra, Math 111.....	3	
Fund of Speech, SpCm 101.....	3	or 3
Intro to Sociology, Soc 100.....		3
Gen Psychology, Psyc 101.....	3	or 3
Soils, PS 113.....	3	
Humanities Elective.....	3	
Work Experience, PR 496† (Summer)		

Sophomore Year	F	S
Macroeconomic Principles, Econ 201.....	3	
Hort Insects, Ent 295 or Plant Pathology, PS 223.....	3	
Intro to Physics, Phys 101.....		4
Humanities elective.....	3	or 3
Geology, PS 243.....		3
Park Admin & Organization, PR 201.....	3	
Outdoor Rec Resource Mgmt, PR 202.....		3
State & Local Gov't, PolS 210 or Am. Gov't, PolS 100.....	3	or 3
Computer Science elective, CSc 112 or CSc 203.....	2	or 2
Envir Conser, WL 210 or Prin of Ecology, Bio 211 or Forest Ecology, F 232.....	2-3	
Work Experience, PR 496†.....	1	
Animal Kingdom, Zool 203.....	3	

Junior Year	F	S
Junior Comp, Engl 300.....	3	or 3
Soil & Water Mechanics, MA 333.....		3
Woody Plants, Ho 313 or Dendrology, F 232.....	3-4	
Hort elective, Ho 311 or Ho 413.....	3	or 3
Landscape Design I, La 321.....	3	
Park Interpretation, PR 301.....	3	
Public Speaking, SpCm 315.....	3	or 3
Economics/Bus Adm electives*.....	3	or 3
Commercial Recreation Areas, PR 302.....		3
Work Experience/Internship, PR 496†.....	1-3	
Electives†.....		2

Senior Year	F	S
PolS adm elective, PolS 320, PolS 408 or PolS 428.....		3
Technical Communication, Engl 303.....	3	
Park Operations and Facilities Mgmt, PR 300.....	3	
Land-use Planning electives**.....	3	
Seminar, Ho 470.....	1	
Advanced Park Management, PR 401.....		3
Turf Management, Ho 211.....		3
Community Recreation, Recr 440.....		2
Economics/Bus Adm. electives*.....	3	
Electives†.....	0-3	

\*9 Economics and Business Adm. elective credits to be selected from the following (students desiring an Econ. Minor should consult catalog or adviser): Microeconomic Principles, Econ 202; Public Finance, Econ 433; Marketing, Econ 353; Princ of Actg I, Actg 210; Prin of Actg II, Actg 211; Business Law I, B-Ad 350; Business Law II, B-Ad 351; Business Mgmt, B-Ad 360; Statistical Meth I, Stat 341.

\*\*6 Land-Use Planning elective credits to be selected from the following: Planning Public Grounds, La 324; City Planning, LA 421;

Site Planning, LA 322; Soil Geog & Land-Use Interp. PS 310; Princ. of State, Reg. & Com. Planning, Plan 591; Tech of State, Reg. & Com. Planning, Plan 592.

†Students must obtain 2 to 4 credits of PR 494, 495, 496 Prof. Internship/Coop Ed/Field Work Experience in Park Management by completing either (a) or (b):

(a) Field Work Experience (PR 496) Work 2 summers or equivalent time unit between freshman and senior years in Dept. approved park or recreation system, agency or institution. 1 credit per each summer or semester completed.

(b) Field Work Experience (PR 496) and Prof. Internship (PR 495), Cooperative Ed (PR 494) Work 1 summer or equivalent time unit as stated in (a) for 1 credit and participate in Dept. approved Professional Internship for 1 semester for 3-12 credits.

‡Students are encouraged to use electives to broaden their perspective and/or to develop an area of specialization. Consult with your adviser. Students will have up to 7 credits of electives depending on their selection of specified electives and choice of PR 494, 495, 496 option (a) or (b).

#### \*\*Suggested Electives for Park Management Curriculum:

Geographic Aspects of Regional Planning, Geo 464; Recreation Leadership, Rec 360; Camp Administration & Camp Counseling, Rec 370; Plant Propagation, Ho 312; Introduction to Research Methods, Soc 310; Rural Sociology, Soc 240; Discussion, SpCm 334; Intro. to Wildlife and Fish. Mgmt., WL 220; Intro. to Ethics, Phil 225; Publicity Methods, MCom 313; Basic Photography, MCom 151; History American West, Hist 265; Stad. First Aid, Hlth 260; Water Safety Instr, PE 321; Theatre Act, Thea 135; Creative Writing, Engl 383; Princ of Range Sci, Rang 300.

### Undergraduate Courses

#### 201 Park Administration & Organization 3(3,0)F

Introduction to park and recreation resource management including fundamentals governing public park and recreation agencies. Includes administrative organization, history, types and benefits of parks.

#### 202 Outdoor Recreation Resource Management 3(2,2)S

Development and management of outdoor recreation areas and resources including planning, administration, and management practices as they relate to parks, forests, land and water resources, wildlands, and private areas. Analysis of participation trends, opportunities, and resource supply. P, PR 201 or consent.

#### 300 Park Operations and Facility Management 3(2,3)F

Principles and practices of park operations and facility management including planning, fiscal and personnel management, regulations, liability, visitor safety and control, and the maintenance and protection of natural resources, equipment, and related facilities. P, PR 201 and 202 or consent.

#### 301 Park Interpretation 3(2,3)F

Principles and methods employed to promote resource awareness and communicate information about natural, cultural, and managerial features of parks and recreation areas to park visitors and resource users. The planning, development and use of interpretive techniques and media such as personal services, public relations, publications, audio-visual programs, exhibits, and environmental education activities. P, PR 201 and 202 or consent.

#### 302 Commercial Recreation Areas 3(3,0)S

Factors represented by commercial recreation areas to include history, trends, supply, demand, relationships to tourism, management, development and technical assistance. P, PR 201 and 202 or consent.

#### 401 Advanced Park Management 3(2,2)S

Current philosophies, advanced techniques, and synthesis of park management principles. P, PR 201, 202, 300 and 301 or consent.

#### 492 Special Problems 1-2FS

Directed independent study into specific problems or topics related to park and recreation resource management. Maximum of 4 credits. P, consent.

#### 493 Special Topics 1-4FS

Special course offering to address specific topics of current interest to students and professionals in the field of park and recreation resource management.

**494-495-496 Cooperative Education/Professional Internship/Field Experience in Park Management 1-12FSSu**

Select either (a) or (b): (a) Field Work Experience. Summer work experience with department approved park or recreation system, agency, or institution. One credit per semester or equivalent time unit.

(b) Prof. Internship. A supervised on-the-job practical experience program for selected Park Management students. P, Junior standing and must have completed 2 years of the Park Management curriculum, or consent of adviser. 3-12 credits per semester.

**Pre-Forestry (F)**

The two-year pre-forestry curriculum is offered for students who expect to enter a school of forestry to complete the Bachelor of Science degree. For students interested in such phases of forestry as wood technology, forest recreation, or lumber merchandising, it may be necessary to revise the designated two-year curriculum to meet the requirements of the selected forestry school degree program.

**Curriculum in Agriculture, Pre-Forestry**

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp, Engl 101 .....	3 or	3
Intro to Sociology, Soc 100.....	3	
Fitness & Lifetime Activities, PE 100.....	1	1
Intro Biology, Bio 151.....	3	
Botany: Structure and Function, Bot 200.....		3
Algebra & Trigonometry, Math 113.....	5	
General Forestry, F 131.....	2	
Mathematical Analysis I, Math 123 or Calculus for Non-Math majors, Math 222....		5
Gen Chem, Chem 110.....		4
Fund of Speech, SpCm 101.....	3 or	3

<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Junior Comp, Engl 300 .....		3
Intro Physics, Phys 101 or 111.....		4
Macroeconomic Principles, Econ 201.....	3	
Soils, PS 113.....	3	
Forest Ecology, F 232.....		3
Programming with BASIC, CSc 112 or PAS- CAL Programming, CSc 114.....		2
Dendrology, F 231 .....	3	
Geology, PS 243 .....	3	
Elementary Organic Chem, Chem 120.....	4	
Intro to Entomology, Ent 105 or Hort In- sects, Ent 295 .....	3 or	3

**Undergraduate Courses**

- 131 General Forestry 2(2,0) F**  
Introduction to forestry. Emphasis on American forestry. Brief description of forestry as a profession.
- 231 Dendrology 3(2,3) F**  
Identification, classification and characteristics of commercial forest trees of U.S. Laboratory Identification of S.D. trees and shrubs.
- 232 Forest Ecology 3(3,0) S**  
Basic factors controlling forest growth and development under natural conditions.
- 331 Farm Forestry 3(3,0) S**  
Brief history of U.S. forestry; tree and its environment; farm woodland forestry with emphasis on windbreaks and shelterbelts.
- 492 Problems 1-2 cr. FS**  
Special investigations in forestry. Maximum of 4 hours credits. P, consent.
- 493 Special Topics 1-4 FS**  
Special forestry topics offered for group study.
- 494-495-496 Professional Internship/Cooperative Education/Field Experience in Forestry 1-12 FSSu**  
See course description under Horticulture curriculum.

**Humanities (Hum)**

**College of Arts and Science**

Professor Alexander, Department of English, coordinator.

Humanities courses enable a student to examine various dimensions of the human condition by cutting across specialized academic disciplines. They emphasize understanding cultures, ethnic groups, and women through a humanistic approach to the subject. Courses are approved for humanities credit.

**Undergraduate Courses**

- 213 Women in American Culture 1-3(1-3,0)**  
(Alternate semesters) A humanistic examination of women in American culture, based upon study of relevant literature. Readings drawn from Scripture, Greek drama, philosophy and psychology, English and American literature, and history, with discussions, visiting lectures by speakers on or off-campus, and pertinent audio-visual materials. Accepted as credit toward Women's Studies Minor. Accepted as humanities credit.
- 215 Ethnic Literature 1-3(1-3,0)**  
(Alternate year) Cultures of significant ethnic minorities in the U.S.: a humanistic examination of literature. The literature of Native Americans, Afro-Americans, Asiatic Americans, Chicanos, Jews, Scandinavians, etc., with an emphasis upon understanding ideas, lifestyle, artistic expression of the particular group in a multi-ethnic society. Readings, audio-visual presentations, discussion and lectures by other faculty members, the international student community or off-campus authorities will be utilized in developing consciousness of ethnic diversity in the U.S. Accepted as humanities credit.

**Indian Area Studies Program**

Dr. Charles Woodard, Coordinator  
An intercollege program of Native American culture studies. Purposes are 1) draw together courses already taught on this campus into an Indian Studies Program; 2) encourage the enrollment of Native American students by providing a coordinated program in their culture at this university; 3) provide an opportunity for all university students to learn about the achievements of the American Indian.

Courses already approved for acceptance in the minor are:

Course Number	Course Title	Credit Hours
Anth 320	Cultural Anthropology .....	3
Anth 421	Indians of North America .....	3
Engl 256	Literature of the American West .....	3
Engl 351	American Indian Literature of the Past .....	3
Engl 352	American Literature of the Present .....	3
Engl 692/ or 792	Seminar in American Indian Literature.....	3
Geog 219	Geog of South Dakota .....	3
Hist 265	History of the American West.....	3
Hist 368	History of American Indians.....	3
Hum 215	Ethnic Literature.....	3
Soc 350	Ethnic and Racial Groups .....	3
Phil 205	Introduction to Philosophy (special section) .....	4

Other courses will be added as they are approved by the Indian Area Studies Committee.  
If you desire a minor in this area you must complete 20 hours of academic credit in a program of study approved by the Indian Area Studies Committee.  
Students desiring more information or interested in minoring in Indian Studies should consult with the coordinator of the program no later than the beginning of the junior year.

# Journalism And Mass Communication (MCom)

## College of Arts and Science

Professor Lee, Head; Professor Emeriti Markland, Phillips, Straw; Associate Professors Holmes, Van Ommeren; Associate Professors Emeriti Abel, Cline, Laird, Wentzy; Assistant Professors Getz, D. Lundgren, McBride Petrella; Instructors Griesenbrock, G. Lundgren.

The department offers courses in journalism and printing. A four-year program leading to the bachelor of arts or bachelor of science degree is available in journalism with sequences in news-editorial, advertising and broadcast journalism. Additional four-year programs leading to the bachelor of science degree are available in science and technical writing, agricultural journalism, home economics journalism, printing-journalism, printing management and printing education. For the two-year program in printing, see Associate Degree Programs.

**Journalism** The major in journalism (with sequences in news-editorial, broadcast, advertising and science and technical writing) prepares you for positions requiring a broad liberal education plus sound knowledge of journalistic skills.

You normally begin the major in the freshman or sophomore year, but may begin in the junior year since most of the journalism courses are junior and senior level courses. You must have a grade of C or better in freshman English. You may not graduate with less than a 2.5 average in journalism courses and no grade below C in any major course. (See Requirements of the College of Arts and Science.)

The department and its news-editorial sequence have been accredited by the American Council on Education for Journalism and Mass Communication, the only organization granted authority to accredit journalism schools. The department is one of approximately eighty journalism programs in the United States that are accredited. It has been accredited continuously since journalism accrediting started and was reaccredited in 1982.

**News-Editorial Sequence.** Students who want to be reporters or editors for weekly or daily newspapers, magazines, wires services or who want to work in public relations or government information agencies usually take this sequence. The emphasis is on writing and reporting, editing, design and layout, ethics. Students can also select courses in advertising and broadcast journalism.

**Broadcast Journalism Sequence.** Students who want to work in news at radio and television stations take this sequence. In addition to general news writing and reporting skills, it emphasizes radio and television news reporting, ethics, and broadcast production. Students can also select courses in news or advertising.

**Advertising Sequence.** Students who want to work in newspaper, broadcast or magazine advertising sales or production or who want to work in advertising agencies or with advertising departments take this sequence. They study principles of advertising, advertising copywriting and layout, advertising campaigns, media research, ethics, advertising sales and marketing. Students can also select courses in news or broadcast.

**Science and Technical Writing.** For students who wish to become technical writers, either for commercial companies, magazines or newspapers. Students combine mass communication skills with strong background in selected areas of science.

**Agricultural Journalism.** Students may major in both agriculture and journalism thus preparing themselves for careers in many areas that draw upon mass communication skills and a knowledge of agriculture. Those careers include reporting and editing for agriculture magazines and newspapers, for breed magazines, for agriculture sections of general newspapers. Also for careers in broadcasting as farm directors, for careers in public relations or advertising with agri-business firms, for careers in agriculture extension services.

**Home Economics Journalism.** Intended to prepare home economics graduates for journalism positions with colleges, government agencies, newspapers, magazines, radio, television and other organizations that require persons with mass communication skills and a knowledge of home economics.

**Printing and Journalism.** A program combining printing with journalism provides a separate major for graduates entering the publishing field, where a knowledge of printing coupled with journalistic skills is a principal qualification. Graduates are especially well qualified to work in public relations, advertising and other phases of publishing. Consists of 35 credits in printing and 18 credits in journalism. Not more than 40 credits in printing or 24 in journalism may be counted toward the BS degree.

**Minor in Journalism.** Available for students majoring in other fields. Courses required are newswriting and reporting, newspaper editing, editing laboratory and other journalism courses to total 16 credits.

**Graduate Work in Journalism.** A M.S. degree is offered. (See the Graduate School catalog for details.)

**Facilities:** The Neuharth Newsroom for editing and reporting has an electronic editing system consisting of five video display terminals and a microprocessor that receives the Associated Press wire news. In addition it has a digital, laser typesetter and a lab with electric typewriters. The photographic darkroom has ten individual darkrooms for film and a central printing room with ten new Besler enlargers. Broadcast facilities include an off-air studio, color TV mini-cameras and access to KESD-TV and KESD-FM equipment and studios. An advertising and graphic arts laboratory provides drafting tables, light tables and typesetting equipment.

### Course Requirements

**Journalism Major.** Specialized study in professional journalism combined with a broad background in the humanities, social sciences and natural sciences. At least 30 but not more than 36 semester credits in journalism may be applied to a bachelor's degree.

All students following the straight journalism major must take the following journalism core courses: MCom 210, Newswriting and Reporting; MCom 160, Basic Photography; MCom 414, Mass Communication Law and MCom 494, Journalism Internship; MCom 417, History of Journalism, or MCom 572, Mass Media in Society; MCom 151, Intro to Mass Communication, while not required, is strongly recommended.

You must choose one of the three sequences in journalism: news-editorial, broadcast and advertising. Additional course requirements for each of these sequences are specified below.

**News-Editorial Sequence.** You must take MCom 310, Newspaper Editing; MCom 311, Editing Laboratory; MCom 412, Advanced Editing Laboratory; MCom 213, Journalism Typography; and MCom 316, Public Affairs Reporting.

**Broadcast Sequence.** You must take MCom 333, Radio News Reporting; MCom 332, TV News Reporting; and MCom 331, Radio and Television Production. Optional but strongly recommended: Public Affairs Reporting, MCom 316. Optional: Film Production, MCom 361, and Radio News Laboratory, MCom 336.

**Advertising Sequence.** You must take MCom 213, Journalism Typography; MCom 370, Principles of Advertising; MCom 371, Advertising for Print Media; and MCom 372, Broadcast Advertising and MCom 473, Advertising Campaigns.

**Specialized Majors.** Offered in science and technical writing, agricultural journalism and home economics. See requirements under these curricula.

### Curriculum in Arts and Science, Journalism Major, News-Editorial Sequence

Leading to the Bachelor of Arts degree

Freshman Year	F	S
Fr Comp, Engl 101 .....	3 or	3
Fund of Speech SpCm 101 .....	3 or	3
Foreign Language.....	4	4
Fitness & Lifetime Activities, PE 100.....	1	1
Mathematics.....	3 or	3

Intro to Mass Com, MCom 151 (recommended).....	2		
<b>Sophomore Year</b>			
Newswriting and Reporting, MCom 210.....	3	or	3
Second-year foreign language.....	3		3
Physical science sequence.....	4		4
State & Local Gov't, PolS 210.....	3	or	3
Journalism Typography, MCom 213.....	2	or	2
Basic Photography, MCom 160.....	2	or	2

<b>Junior Year</b>			
Junior Comp, Engl 300.....	3	or	3
Newspaper Editing, MCom 310.....	2	or	2
Editing Lab, MCom 311.....	1	or	1
Public Affairs Reporting, MCom 316.....	3	or	3

<b>Senior Year</b>			
Advanced Editing, MCom 412.....	1	or	1
Mass Communication Law, MCom 414.....	3		3
Either Mass Media in Society, MCom 572,.... or Hist. of Journalism, MCom 417.....	3		3
Journalism Internship, MCom 494.....	2-4	or	2-4
(Internship recommended during summer before senior year)			

<b>Additional Required Credits</b>			Cr.
Social Science.....			24
(To be elected from approved courses in at least three fields)			
Humanities.....			12

Not less than 30 or more than 36 credits in journalism courses may be counted. You must complete at least 40 semester credits in courses numbered 300 or above to qualify for the bachelor of arts degree.

**Curriculum in Arts and Science, Journalism Major, News-Editorial Sequence**

Leading to the Bachelor of Science degree

<b>Freshman Year</b>			
Fr Comp, Engl 101.....	3	or	3
Intro Biology, Bio 151-153.....	3		3
Fitness & Lifetime Activities, PE 100.....	1		1
Mathematics.....	3	or	3
Fund of Speech, SpCm 101.....	3	or	3
Intro to Mass Com, MCom 151 (recommended).....	2		2

<b>Sophomore Year</b>			
Newswriting & Reporting, MCom 210.....	3	or	3
Physical Science sequence.....	4		4
State & Local Gov't, PolS 210.....	3	or	3
Journalism Typography, MCom 213.....	2	or	2
Basic Photography, MCom 160.....	2	or	2

**Junior and Senior Years**  
Same as for bachelor of arts degree curriculum.

<b>Additional Required Credits</b>			Cr.
Social Science (From approved courses in at least three fields).....			24
Humanities (From approved courses in two fields).....			9

Not less than 30 or more than 36 credits in journalism courses may be counted. You must complete at least 40 semester credits in courses numbered 300 or above to qualify for the bachelor of science degree.

**Journalism Major, Broadcast Sequence**

Follow bachelor of arts degree or bachelor of science degree requirements for news-editorial sequence (above) but with the following changes:

(Some MCom courses are listed under Speech)

**Freshman Year**  
Same as news-editorial sequence

**Sophomore Year**  
Same as news-editorial sequence but delete Journalism Typography, MCom 213.

<b>Junior Year</b>			
Junior Comp, Engl 300.....	3	or	3
Radio News Reporting, MCom 333.....	3	or	3
Television News Reporting, MCom 332.....	3		3

Optional: Public Affairs Reporting, MCom 316;  
Film Production, MCom 361  
Optional: Radio News Laboratory, MCom 336

<b>Senior Year</b>			
Radio & TV Production, MCom 331.....	3		3
Mass Communication Law, MCom 414.....	3		3
Either Mass Media in Society, MCom 572,.... or History of Journalism, MCom 417.....	3		3
Journalism Internship, MCom 494.....	2-4	or	2-4
Optional: Radio News Laboratory, MCom 336			

Not less than 30 or more than 36 credits in journalism may be counted. You must complete at least 40 semester credits in courses numbered 300 or above to qualify for the bachelor of science or bachelor of arts degree.

**Journalism Major, Advertising Sequence**

Follow bachelor of arts degree or bachelor of science degree requirements for news-editorial sequence (above) but with the following changes:

**Freshman Year**  
Same as news-editorial sequence

<b>Sophomore Year</b>			
Same as News-Editorial but delete PolS 210.			
Add:			
Macroeconomics Principles, Econ 201.....	3	or	3
Consumers and the Market, Econ 391.....	3	or	3

<b>Junior Year</b>			
Junior Comp, Engl 300.....	3	or	3
Principles of Advertising, MCom 370.....	3		3
Advertising Copy and Layout, MCom 371.....			3
Broadcast Advertising, MCom 372.....			3

<b>Senior Year</b>			
Advertising Campaigns, MCom 473.....	3		3
Mass Communication Law, MCom 414.....	3		3
Either Mass Media in Society, MCom 572.... or History of Journalism, MCom 417.....	3		3
Journalism Internship, MCom 494.....	2-4	or	2-4

Not less than 30 or more than 36 credits in journalism may be counted. You must complete at least 40 semester credits in courses numbered 300 or above to qualify for the bachelor of science or bachelor of arts degree.

**Curriculum in Agriculture, Agricultural Journalism Major**  
Leading to the Bachelor of Science degree

<b>Freshman Year</b>			
Fr Comp, Engl 101.....	3	or	3
Fitness & Lifetime Activities, PE 100.....	1		1
Gen Chem, Chem 110.....	4		4
Algebra, Math 111 or Algebra & Trigonometry, Math 113.....	3-5		3-5
Intro to Sociology, Soc 100.....			3
Biological Science.....	3-4		3-4
Intro Physics, Phys 101 or Elementary Physics I, Phys 211.....			4-5
Agri Group I elective (See College of Agriculture listing).....	3		3

<b>Sophomore Year</b>		<b>F</b>	<b>S</b>
Econ 201.....	3	or	3
Agri Group I elective.....	3		3
Fund of Speech, SpCm 101.....	3	or	3
Newswriting & Reporting, MCom 210.....	3	or	3
Journalism Typography, MCom 213.....	2	or	2
Basic Photography, MCom 160.....	2	or	2
Social Science elective.....	3	or	3
Second in sequence of physics, chemistry or biology.....	3-4	or	3-4

<b>Junior Year</b>		<b>F</b>	<b>S</b>
Junior Comp, Engl 300.....	3	or	3
Newspaper Editing, MCom 310.....	2	or	2
Editing Lab, MCom 311.....	1	or	1
Magazine Writing & Editing, MCom 315.....	3	or	3
Principles of Advertising, MCom 370.....			3
Plant Science Elective.....	3	or	3
Radio News Reporting, MCom 333.....	3	or	3
Humanities elective.....	3		6
Agriculture electives.....	3		3

<b>Senior Year</b>		<b>F</b>	<b>S</b>
Mass Communication Law, MCom 414.....	3	or	3
Advanced Reporting, MCom 410.....	3		
Journ Internship, MCom 494.....	2-4	or	2-4
Electives in Agriculture†.....	3		3

At least 30 but no more than 36 credits in journalism are allowed. 40 upper division credits required.

All requirements of Agricultural and Biological Sciences core curriculum must be completed. A minimum of 12 credits from Group I courses in Agriculture must be completed. A minimum of 12 additional hours of courses in agriculture must be completed.

The Agri Group I electives and the Journalism electives must be planned and approved by advisers in each area.

†Suggested: AS 223 Animal Nutrition; PS 391 Crop and Livestock Insects; PS 343 Weed Control; Econ 353 Marketing; Econ 271 Farm and Ranch Management; or PS 223 Principles of Plant Pathology I.

**Journalism Major, Science and Technical Writing Option**  
Leading to the Bachelor of Science degree

<b>Freshman Year</b>		<b>F</b>	<b>S</b>
Fr Comp, Engl 101.....	3	or	3
Algebra & Trigonometry, Math 113.....	5		
Engineering Graphics, EG 121.....	3		
Intro Biology, Bio 151-153.....	3		3
Fitness & Lifetime Activities, PE 100.....	1		1
Gen Chem, Chem 114.....			4
Fund of Speech, SpCm 101.....	3	or	3

<b>Sophomore Year</b>		<b>F</b>	<b>S</b>
Physics, Phys 111-113.....	4		4
Newswriting & Reporting, MCom 210.....	3	or	3
Journalism Typography, MCom 213.....	2	or	2
Gen Microbiology, Micr 231.....			4
Basic Photography, MCom 160.....	2	or	2

<b>Junior Year</b>		<b>F</b>	<b>S</b>
You should decide whether you wish to emphasize the physical sciences, biological sciences or technology, and elect an additional 20 credits in science or technology.			
Junior Comp, Engl 300.....	3	or	3
Newspaper Editing, MCom 310.....	2	or	2
Editing Lab, MCom 311.....	1	or	1
Statistical Methods I, Stat 341.....			3
Radio News Reporting, MCom 333.....	2	or	2
Magazine Writing & Editing, MCom 315.....	3	or	3

<b>Senior Year</b>		<b>F</b>	<b>S</b>
Advanced Reporting, MCom 410.....			3
Mass Com Law, MCom 414.....	3	or	3
Journ Internship, MCom 494.....	2-4	or	2-4

**Additional Required Credits** **Cr.**  
 Social Science (From approved courses in at least 3 fields.) ..... 18  
 Humanities (From approved list in two fields.) ..... 9  
 Not less than 30 but not more than 36 credits can be earned in journalism.

Courses are listed under the following headings: Mass Communication (MCom); General Communication (GCom); and Printing (Prtg).

## Journalism & Mass Communication (MCom)

### Undergraduate Courses

- 130 Intro to Radio & TV 3(3,0) F**  
History, structure, regulation, and financial support; potential and limitations; public responsibilities, impact on society.
- 151 Intro to Mass Com 2(2,0) F**  
Nature and scope of journalism and mass communication — newspapers, magazines, broadcasting, wire services, syndicates. Recommended for Journalism students.
- 160 Basic Photography 2(1,3) FS**  
Beginning camera and darkroom techniques, including processing and printing black and white photographs. The student will also survey the field of photography and its uses.
- 210 Newswriting & Reporting 3(2,3) FS**  
Gathering, evaluating and writing news. P, freshman English grade no lower than C. Not open to freshmen without consent.
- 213 Journalism Typography 2(1,3) FS**  
Printing; type faces and processes; page pasteup, proofreading.
- 261 Photojournalism 2(1,3) FS**  
Photography as it relates to the media and the public. Emphasis on the content and design of photo essays, legal and ethical aspects of photography. P, 160.
- 310 Newspaper Editing 2(2,0) FS**  
News evaluation, editing problems, copy reading, page makeup, headlines, picture usage. Must be taken concurrently with 311. P, 210.
- 311 Editing Laboratory 1(0,3) FS**  
Practice in editing. 311 must be taken concurrently with 310.
- 313 Publicity Methods 2(2,0) FS**  
Newswriting, organizing publicity campaigns, press relations. (Cannot be taken for credit by journalism majors.)
- 314 Sales, Promotion & Marketing 3(3,0)**  
Promotion, sales, advertising, circulation, practices and theories of marketing in advertising and graphic arts.
- 315 Magazine Writing & Editing 3(3,0) FS**  
Writing and preparing articles for publication. P, freshman English with grade no lower than C, and consent.
- 316 Public Affairs Reporting 3(2,3) FS**  
Covering and writing news of government, politics, economics, education and sociological problems at the local, county and state level. P, 210, PolS 210 or consent.
- 317 Publication Supervision & Production 2(2,0) S**  
Techniques for producing printed publications.
- 330 Writing for Radio & TV 2(1,3) S**  
Preparation of commercials, public service announcements, talks, interviews, drama, documentaries, and educational programs.
- 331 Television Production 3(2,3) FS**  
Includes preparation and presentation of talks, interviews, discussion and extension and community services for broadcast.
- 332 Television News Reporting 3(2,3) F**  
TV news writing, gathering, and producing. Lab practice with videotape. P, 333 or consent.
- 333 Radio News Reporting 3(1,3) FS**  
Radio news writing, editing and producing. Lab practice with audio tape. Some stories gathered and reported for KESD-FM. P, 210 for majors; 330 for others.
- 335 Broadcast Programming 3(3,0) S**  
Program types and essentials of effective structure. Audience characteristics and preferences. Managerial problems. Agricultural, commercial, and educational broadcast requirements.
- 336 Radio News Laboratory 1-3 FS**  
Gathering, writing, editing and producing daily stories for KESD-FM. P, 333 for majors; 330 for others.

### 365 Advanced Photography 2(1,3) S

Exploration of the fine photographic print. Emphasis on the use of the zone system and principles of composition. Also included will be discussion of the theory of photographic critique. P, 160 and consent.

### 370 Prin of Advertising 3(3,0) F

History, ethics, economics, psychology and impact of modern advertising.

### 371 Advertising Copy and Layout 3(3,0) S

Writing, designing and planning advertising; P, 370.

### 372 Broadcast Advertising 3(2,3) S

Creating and producing broadcast advertisements, promotions and public service announcements. P, 370 or consent.

### 392 Directed Studies

Refer to Arts and Science alternatives and options statement.

### 394 Undergraduate Course Specials

Refer to Arts and Science alternatives and options statement.

### 410 Advanced Reporting 3(2,3) S

Political, scientific, social issues done in in-depth reporting. P, 210.

### 412 Advanced Editing Lab 1(0,3) FS

Advanced editing and production.

### 414 Mass Communication Law 3(3,0) F

Libel, privacy, news gathering rights and press freedom in America.

### 417 History of Journalism 3(3,0)F

Development, impact and importance of individual journalists and media in U.S.

### 450 Special Problems in Journalism 1-3 FSSu

P, senior standing.

### 473 Advertising Campaigns 3(3,0)

Develop advertising campaign from start to finish. P, 370, 371, 372.

### 490 Senior Research Problems 2(2,0) FS

Problems and methods in mass communication research. For advanced undergraduates. P, senior standing.

### 494-495-496 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu

Supervised media experience; print, broadcast, public relations. P. consent of department program coordinator.

## Graduate Courses

### 510-610 Seminar in Mass Communications 2(2,0) FS

Work in selected areas including special investigation, reports and discussion.

### 515-615 Editorial Writing & Policy 2(2,0)F

Opinion function of periodicals; great editorials and editorial writers; writing editorials; shaping policy.

### 517-617 Media Administration & Management 3(3,0) F

Business practices, newspaper, magazine and broadcast management.

### 537-637 Education Radio & TV 3(3,0)

Preparation, presentation of educational and instructional materials for radio, TV, and film and classroom use.

### 553-653 Workshop in Communications 1-4 Su

Understanding and using media in the classroom; supervising school publications. For high school or college instructors and publication advisers.

### 560-660 Special Problems in Radio, TV or Film 1-2 FSSu

Directed research. May be repeated to a total of 4 credits. P, consent.

### 572-672 Mass Media in Society 3(3,0) S

Rights and responsibilities of the press; relation of the media to individuals and society; role of media in a free society.

### 573-673 Public Relations 3(3,0) SSu

Interpreting institutional and industrial policies and programs to the public.

### 651 Special Problems in Communications 1-3 FSSu

P, consent.

### 790 Thesis in Journalism 1-6 FSSu

### 791 Research Methods in Communications 3(3,0) F

## General Communications (GCom)

### Graduate Courses

### 505-605 Theories of Communications 3(3,0) S

Major theories of communication, including media and interpersonal communication.

### 506-606 Public Opinion & Propaganda 3(3,0) S

Formation and measurement of public opinion; role of the media; propaganda techniques, agencies, theories. P, senior standing, consent.

## Printing Management (Prtg)

Professor Lee; Professors Emeriti, Phillips, Straw; Associate Professor Emeritus Abel; Assistant Professors D. Lundgren, Petrella

**Printing Management.** This program prepares students for entry level management positions in the printing and graphic arts industry. Printing Management is a four-year program that stresses managerial and technical course work leading to the bachelor of science degree. You will also receive a solid foundation in the liberal arts. Courses in engineering and computer science are strongly suggested electives.

Technical course work is concentrated in the first two years and is prerequisite to some courses listed for the junior and senior years. Upon successful completion of the first two years the student is eligible for the associate degree.

At least 40 but not more than 50 credits in Printing Management may be counted toward the degree. (See minimum degree requirements for the College of Arts and Science.)

**Printing and Journalism.** A combined program provides a separate major for prospective students in the newspaper and publishing fields.

**Printing-Education.** Prospective printing instructors in vocational schools or high schools will find the curriculum designed for their needs. If you are going into education, you must decide before the junior year, and consult the chairperson of the department and Division of Education. Since most states require printing teachers to have industrial experience before certification, you should know the state regulations and obtain practical experience. The department can assist you in obtaining experience.

**Two-Year Printing Course.** A technical program is offered prospective printing and graphic arts personnel who do not wish to pursue the four-year bachelor of science degree. It provides you with a general education coupled with practical shop courses and experience. The program allows transfer to the four-year printing program with no credit loss. Also, the curriculum requirements include at least 9 of the 12 credits required for a minor in communications, which appears in the section titled "Associate Degree and Certificate Programs."

**Facilities.** The printing laboratory is a modern, well-equipped printing plant. The composing area is equipped with ten technologically advanced typesetters. There are production and student darkrooms, three process-cameras, a film processor and digital exposure equipment. The printing equipment ranges in size from duplicators to single-color, large format offset presses. The bindery and finishing area is also fully equipped with folding equipment on through saddle and perfect binding machines.

**Non-credit Vocational Courses.** For those who wish to become printing craftsmen, admission standards need not be met, but you must have department approval and be 16 years old.

**Limited Enrollment.** The number of students is limited by the space and equipment available. At present the limit for entering freshmen is 20. Advanced application to the Director of Admissions is required.

**Waiving Courses for Experienced Students.** Students with demonstrated proficiency may be excused from appropriate courses and substitute other courses with department approval.

**Standards of Proficiency.** Students who are not capable of meeting standards may be dropped from courses or required to attend additional classes.

Curriculum in Arts and Science, Printing Management Major  
Leading to the Bachelor of Science degree

Freshman Year	F	S
Fr Comp, Engl 101 .....	3	or 3
Fund of Speech, SpCm 101 .....	3	or 3
Fitness & Lifetime Activities, PE 100 .....	1	1
Basic Presswork, Prtg 111 .....		3
Intro to Graphic Arts, Prtg 112 .....	3	
Composing Machines, Prtg 113 .....		3

Algebra, Math 111 or 113.....	3	or	3
Reproduction Photography, Prtg 213.....	3		
Basic Design, ArtsS 112.....	3	or	3
<b>Sophomore Year</b>	<b>F</b>		<b>S</b>
Typography, Prtg 211.....	3		
Photography, MCom 160.....	2	or	2
Bindery, Finishing and Distribution Prtg 212..	3		
Pricing, Prtg 214.....			3
Newsriting & Reporting, MCom 210.....	3	or	3
or Publicity Methods, MCom 313.....	2	or	2
Graphic Design I, ArtD 231.....	3	or	3
Physical Science.....	4		4
<b>Junior Year</b>	<b>F</b>		<b>S</b>
Junior Comp, Engl 300.....	3	or	3
Macroeconomics Principles, Econ 201.....	3	or	3
Prin of Accounting, Econ 210.....	3	or	3
Biological Science.....	3		3
*Plant Administration, Prtg 311.....	3		
*Media Personnel Management, Prtg 312.....	3		
*Media Labor Management, Prtg 313.....			3
*Sales, Promotion and Marketing, Prtg 314.....			3
Advanced Presswork, Prtg 315.....	3		
<b>Senior Year</b>	<b>F</b>		<b>S</b>
*Manufacturing Control, Prtg 413.....			3
*Estimating, Prtg 411.....			3
Production Management in Graphic Arts, Prtg 414.....			3
Tone and Color Reproduction, Prtg 415.....			3

<b>Additional Required Credits for degree</b>	<b>Cr.</b>
Printing Management.....	2
(Elected from courses numbered 300 or above)	
Social Science (Elected from approved list).....	9
Humanities (Elected from approved list).....	6

\*Offered Alternate Years.

Not more than 50 credits in printing management and 16 credits in journalism will be counted. All students must complete a minimum of 40 semester credits in courses numbered 300 or above to qualify for the degree.

**Curriculum in Arts and Science, Printing-Education Major**  
Leading to the Bachelor of Science degree

**Freshman & Sophomore Years**  
Same as Printing Management.

<b>Junior Year</b>	<b>F</b>		<b>S</b>
Junior Comp, Engl 300.....	3	or	3
Practicum & Professional Lab Experiences, SeEd 339.....	2		
Gen Psychology, Psc 101.....	3		
Biological Science.....	3		3
Intro to American Education, EdFn 339.....			2
Ed Psychology, EPsc 302.....			2

<b>Additional Required Credits</b>	<b>Cr.</b>
Printing Management.....	9
(Elected from courses numbered 300 or above)	
Social Science.....	12
(Elected from approved courses in at least two of the following fields; economics, history, political science and sociology)	
Humanities (Elected from approved list).....	9
Education Block.....	17

**Curriculum in Arts and Science, Printing-Journalism Major**  
Leading to the Bachelor of Science degree

**Freshman & Sophomore Years**  
Same as printing management except MCom 210 is required.

<b>Junior Year</b>	<b>F</b>		<b>S</b>
Junior Comp, Engl 300.....	3	or	3
History of Journalism, MCom 416.....	3		
Prin of Accounting, Actg 210.....	3		
Newspaper Editing, MCom 310.....	2	or	2
Editing Lab, MCom 311-412.....	1		1
Biological Science.....	3		3
Principles of Advertising, MCom 370.....	3		
<b>Senior Year</b>	<b>F</b>		<b>S</b>
Mass Com Law, MCom 414.....	3		
Sr. Research Problems, MCom 490.....	2	or	2
Printing Internship, Prtg 494.....	2-4	or	2-4
*Sales, Promotion, and Marketing Prtg 314.....			3

<b>Additional Required Credits</b>	<b>Cr.</b>
Social Science.....	15
(Elected from approved courses in at least three of the following fields: economics, history, political science, psychology & sociology)	
Humanities (Elected from approved list).....	9

\*Offered Alternate Years.

Requires 35 credits in printing and 18 credits in journalism. Not more than 40 credits in printing and 24 credits in journalism will be counted. You must complete a minimum of 40 semester credits in courses numbered 300 or above to qualify for the bachelor of science degree.

**Summer Vocational Courses in Printing — Non-Credit Vocational Courses**

The vocational printing course descriptions appear below and require advanced application and consent. You may enroll for two courses, or for the same course twice, which will constitute a full load, equivalent to 8 credits for fee purposes. You may not enroll in any other courses. A limited number are accepted; the courses offered are only in summer sessions if their demand is sufficient. Enrollment may be for either half load or full load. A full load is from 30 to 40 clock hours a week. Tuition is the same as regular credit courses, based on a full load equaling 8 credits. You pay all regular university fees.

**Non-Credit Vocational Courses**

**Practice Shop Work** (Not for college credit)

Vocational printing courses listed are offered.

**011 Composing Machines Su**

Markup, preparation and fundamental operation of phototypesetting machines. 320 clock hours.

**012 Offset Camera, Stripping, Platemaking Su**

Engraver's camera, 120 hours; imposition and stripping, 160 hours; platemaking, 40 hours.

**013 Offset Presses Su**

Paper stocks and inks, 40 hours; moisture and inking systems, 80 hours; operation, 200 hours.

**Undergraduate Courses**

**111 Basic Presswork 3(2,4) S**

Concentrated study of the offset lithographic principles and their applications. Areas covered include impositions, stripping and operation of small offset presses.

**112 Introduction to Graphic Arts 3(2,2) F**

Basic reproduction processes, their history, development and scope. The nature and position of the industry in society.

**113 Composing Machines 3(2,2) S**

Exposure to the areas of hot and cold type composition and equipment. Majority of the course deals with phototypesetting equipment and systems and applications of computers to this subject matter.

**211 Typography 3(2,2) F**

Discussion and practical experiences in the concepts of design and layout and their relation to advertising and commercial products.

**212 Bindery, Finishing and Distribution 3(2,2) S**

Finishing, bindery and distribution equipment, paper handling and control, automatic systems, packaging and mailroom delivery functions.



### 213 Reproduction Photography 4(2,2) S

In-depth study of high contrast process camera photography. Subject matter studied includes line and halftones, PMT, special effects, posterizations and duotones.

### 214 Pricing 3(3,0) S

Theory of pricing, utilization of cost finding methods, record keeping and standards of the industry.

### 311 Plant Administration 3(3,0) F

Management principles with emphasis on the problems of operation and control. Legal and tax requirements; forms of business organization; office and records.

### 312 Media Personnel Management 3(3,0) F

Basic personnel processes involved in the procurement, development and maintenance of human resources as applied generally and specifically to graphic arts industry.

### 313 Media Labor Management 3(3,0) S

Labor administration and relations; labor market trends; development of labor law judicial and arbitration decisions, current administrative policy.

### 314 Sales, Promotion and Marketing 3(3,0) S

Promotion, sales, advertising, circulation, practices and theory of marketing in advertising and graphic arts.

### 315 Advanced Presswork 3(2,3) F

Comprehensive study of the reproduction of high quality four color process printing. Imposition, stripping techniques, operation of large offset presses and maintenance will be covered.

### 411 Estimating 3(3,0) S

Cost finding, variables in production, man-and machine-hour rate determination. Individual plant pricing system development and use including computers.

### 412 Production Problems FSS

Individual problems in production or management. May be repeated to a total of four credits. P, consent.

### 413 Production Management in Graphic Arts 3(3,0) F

Scientific approach to production problems in commercial printing, newspaper and magazine publication; technological advances and innovations in methods, processes and management.

### 414 Manufacturing Control 3(3,0) S

Quality control in manufacturing cycle, case studies of layout, acquisition and control problems. P, 311.

### 415 Tone and Color Reproduction 3(2,3) S

Study of the nature of light and color and their interrelationship. Reproduction of four color separations using the direct screen process. Other areas include indirect screening, color correction, masking and electronic scanning.

### 494-495-496 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu

Supervised experience in printing. P, consent of department program coordinator.

## Latin American Area Studies Program

Professor Bates, Department of Foreign Languages, coordinator

The student may cross college and department lines to pursue, with the study of Spanish, a coordinated study of the geographical, cultural, socio-economic and political life of Latin American countries.

The program is primarily vocational. The curriculum is tailored for those desiring a Latin American background in conjunction with a disciplinary specialization in fields such as history, economics, political science, geography, anthropology, Spanish American literature and sociology, or in one of the professional colleges. As a result you will normally carry a major in a particular discipline such as Food and Nutrition or Agronomy together with the LAAS program.

This program prepares you for additional vocational opportunities in Agriculture, Home Economics, Nursing, Foreign Service, Peace Corps, business, international numerous positions with government, the United Nations and private corporations involved with or in Latin America. It should also facilitate improved communication and understanding between the peoples of these countries and the U.S. Courses should be integrated with the student's vocational major. See a faculty adviser and the coordinator of the program.

### Curriculum in Latin American Area Studies

(Minimum of 22 credit hours as indicated below)

### Section A

	Credits
1st Year Spanish, Span 101-102 .....	4-4
2nd Year Spanish, Span 201-202 .....	3-3
Spanish Comp/Conversation, Span 311-312.....	2-2

Minimum Sub Total

8

### Section B

	Credits
Spanish Am Lit, Span 365.....	3
Spanish Am Civilization, Span 436 .....	2
20th Century Spanish Am Lit, Span 484 .....	3
Directed Study in Spanish, Span 491.....	1-3

(oriented toward Latin America)

### (Courses in English)

History of Latin Am, Hist 417-418 .....	3-3
Topics in Latin Am History, Hist 310.....	3
Geography of Latin Am, Geog 312.....	3

### (LAAS courses)

Latin Am Cultures (Topical), LAAS 301.....	3
Latin American Societies (Topical), LAAS 302 .....	3
Directed Studies in Latin Am Cultures, LAAS 401 .....	1-3

Minimum Sub Total

14

### Recommended Electives

(Additional courses in Spanish are strongly recommended.)

Human Development: Cultural and Economic Influences, CDFR 363.....	2
Human Nutrition, NFS 321 .....	3
Comparative Econ Systems, Econ 405.....	3
International Econ, Econ 540 .....	3
Current World Prob, PolS 253 .....	3
International Politics, PolS 351 .....	3
International Law & Organizations, PolS 356 .....	3
Political Theory, PolS 461-462 .....	3
Cultural Anthropology, Anth 220 .....	3
Gen Anthropology, Anth 200.....	3
Population Problems, Soc 362.....	3
Community Development, Soc 440.....	3
Am Diplomatic History, Hist 468 .....	3

## Undergraduate Courses

### LAAS 301 Latin American Cultures 3(3,0) (Topical)

A broad view of a country, region, epoch or theme concerning Latin America. A multidisciplinary and multimedia approach. General supervision by the coordinator of Latin American Area Studies program. P, Sophomore standing or consent. May be repeated with consent of the coordinator of the LAAS program. Enrollment limited to 20.

### LAAS 302 Latin American Societies 3(3,0) (Topical)

A broad view of the society of a country, region, epoch or theme concerning Latin America. A multidisciplinary and multimedia approach. P, sophomore standing or consent. May be repeated for credit with consent of the LAAS Coordinator.

### LAAS 491 Directed Studies in Latin American Cultures 1-3(1-3,0)

Advanced students interested in in-depth study of particular aspects of a given country, region, epoch or theme concerning Latin America may enroll for 1-3 credit hours of independent multidisciplinary directed study. Studies will be planned and method of evaluation and grading established by one or more instructors in consultation with the student, under the general supervision of the coordinator of the LAAS program. May be repeated with consent of the coordinator of the LAAS program. P, junior standing or consent.

## Mathematics (Math)

### College of Engineering

Professor Yocom, Head; Professors Bennett, Bergum, Lacher, Richards; Professors Emeriti Engebretson, Kranzler, Nelson, Trapp, Wentz; Associate Professors Ayers, Bryn, Clever, Kemp, Monahan,

Nielsen, Vandever; Assistant Professors Broschat, Ganapathy, Reid, Roe, Struck, Yokota; Instructor Schmidt.

**Major Programs**

The mathematics degree programs provide a strong liberal arts emphasis with opportunity for concentrated study in mathematics to meet the needs of the technically oriented student, the prospective secondary mathematics teacher and the student preparing for graduate studies.

Beginning with Math 123, the B.A. major program requires 32 semester credits in mathematics while the B.S. major requires 36. Mathematics majors who must take Math 113 as a prerequisite for succeeding courses will be allowed 5 credits toward the 128 semester credits required for graduation. Mathematics majors must earn at least a "C" in Math 224 and all succeeding mathematics courses. In the curricula below, courses in the physical, biological and social sciences have been chosen to provide a strong background for students planning on graduate study or careers in business, industry or teaching. Students taking the Secondary Education option should consult with the Dean of the Division of Education before registering for their junior year. One semester of their senior year is devoted to education courses and student teaching. Consult the Arts and Science section for college graduation requirements.

**Cooperative Education**

The opportunity for experience in business and industry is available to mathematics majors through the Mathematics Cooperative Education Program. Credit for this on-the-job experience may be arranged by enrolling in Math 494.

**Minor Program**

A minor in mathematics consists of Math 123 (or Math 222), Math 224 plus a minimum of 11 credits from the 200 series or above. An average grade of "C" in the minor coursework is required. Math 355 and 361 are required of minors in the Secondary Education option.

**General Information**

Credit for Math 111 will be given to students showing high proficiency on the algebra placement test. Credit for Math 113 will be given to students exhibiting high proficiency on the algebra and the trigonometry placement tests. Placement in succeeding courses is based on the proficiency of the student.

Entering students with 1 1/2 units of high school algebra and better than average ability in mathematics should not enroll in Math 111.

Credit may be earned for both Math 111 and Math 113 in that order only. Credit will not be allowed for both Math 113 and Math 120. Credit will not be allowed for both Math 123 and Math 222.

**Pre-calculus courses will not count toward graduation in Engineering except under special circumstances approved by the Dean of Engineering.**

Beginning courses are available for students entering at times other than the fall semester.

**Curriculum in Arts and Science, Mathematics Major**

Leading to the Bachelor of Arts degree

Freshman Year	Credits
Fr Comp, Engl 101 .....	3
Speech, SpCm 101 .....	3
Alg & Trig, Math 113 .....	5
Math Anal I, Math 123 .....	5
Foreign Language* .....	8
Fitness and Lifetime Activities, PE 100 .....	2
Social Science electives** .....	3
Electives .....	3
	32

**Sophomore Year**

Math Anal II, Math 224 .....	4
Math Anal III, Math 225 .....	3

Elem Logic & Sets, Math 353 .....	2
Foreign Language* .....	6
Social Science electives** .....	6
Humanities electives** .....	3
Computer Programming (CSc 112-Micro Basic, CSc 114, or Math 271) .....	2-4
Electives .....	4-6
	32

**Junior Year**

Jr Comp, Engl 300 .....	3
Technical Communications, Engl 303 .....	3
Natural Sci elective (Lab science) .....	3
Math electives (300 level or above) (Select 3 of Math 313, 315, 425, 426) .....	12
Social Science electives** .....	3
Electives .....	9
	33

**Senior Year**

Math electives (300 level or above) .....	6
Humanities electives** .....	3
Electives .....	22
	31

\*Two years of one foreign language (French, German, or Spanish)

\*\*From at least two areas and including two international studies courses in humanities and/or social science (6 credits total).

**Curriculum in Arts and Science, Mathematics Major**  
Leading to the Bachelor of Science degree

Freshman Year	Credits
Fr Comp, Engl 101 .....	3
Speech, SpCm 101 .....	3
Alg & Trig, Math 113 .....	5
Math Anal I, Math 123 .....	5
Chem 110 or 112 .....	4
Biol Sci electives .....	6
Fitness and Lifetime Activities, PE 100 .....	2
Electives .....	4
	32

**Sophomore Year**

Math Anal II, Math 224 .....	4
Math Anal III, Math 225 .....	3
Computer Prog & Data Proc, Math 271 .....	4
Elem Logic & Sets, Math 353 .....	2
Gen Physics I, Phys 211 .....	4
Gen Physics II, Phys 213 .....	4
Macroeconomics Principles, Econ 201 .....	3
Social Science elective* .....	3
Humanities electives* .....	3
	32

**Junior Year**

Jr. Comp, Engl 300 .....	3
Technical Communications, Engl 303 .....	3
Math electives (300 level or above) (Select 3 of Math 313, 315, 425, 426) .....	12
Social Science electives* .....	6
Humanities elective* .....	6
Electives .....	2

## Senior Year

Math Electives (300 level or above).....	6
Electives .....	26
	—
	32

\*From at least two areas and including two international studies courses in humanities and/or social science (6 credits total).

## Curriculum for Secondary Mathematics Teachers

Students planning to teach mathematics in the secondary schools may follow either the B.A. or the B.S. program above. In their junior and senior years, the 18 credits of 300 level or above mathematics courses must include Math 355, Math 490, and 2 (rather than 3) of Math 313, 315, 425, and 426. In addition, the following courses must be taken. Note that one semester of the senior year is devoted to education courses and student teaching. The student must plan other course work accordingly.

Sophomore Year	Credits
Gen Psychology, Psyc 101* .....	3
Practicum, SeEd 287 .....	2
<b>Junior Year</b>	
Intro to AmEd, EdFn 339 .....	2
Ed Psyc, EPsyc 302 .....	2
Teaching of Reading, SeEd 450 .....	3
History of Am Indians, Hist 368* or Indians of North Am, Anth 421* .....	3

## Senior Year

First Half of Semester:	
Ed Measurements, EdER 415 .....	2
Methods of Teaching in Sec Schools, SeEd 400 .....	3
Prin of Guidance, CGPS 410 .....	2
A-V Methods, SeEd 405 .....	2
Second Half of Semester:	
Supervised Student Teaching, SeEd 488 .....	8

\*May be used as social science elective

## Undergraduate Courses

### 111 Algebra 3(3,0) FSSu

Set concepts, basic properties of real numbers, factoring of polynomials, solution of linear and quadratic equations, inequalities, systems of equations, exponents and radicals. Credit for Math 111 will not be granted to anyone who has previously received credit in Math 113. P, 1 unit of high school algebra.

### 113 College Algebra & Trigonometry 5(5,0) FS

The real number system as related to linear, quadratic, rational, trigonometric, exponential, logarithmic and inverse functions and their applications. Other topics selected from mathematical induction, complex numbers, partial fractions, determinants, matrices, theory of equations, sequences & series. P, 1 1/2 units of high school Algebra. Credit will not be allowed for Math 113 in addition to credit in Math 120.

### 120 Plane Trigonometry 3(3,0) FS

Trigonometric functions, equations and identities; inverse trigonometric functions; exponential and logarithmic functions, and applications of these functions. P, 111 or equivalent.

### 140 Survey of Mathematics 3(3,0) FS

To give the students in social science and liberal arts an appreciation of the nature of mathematics. An introduction to the logical structure of mathematics and its application to modern life, including such topics as logic, number systems, geometry, probability, statistics, and consumer mathematics. P, 1 unit of high school mathematics.

### 143 Finite Mathematics 3(3,0) FS

BASIC programming, linear equations and matrices, graph theory, probability, Markov chains, linear programming and the simplex algorithm, game theory. P, 1 1/2 units of high school algebra, or equivalent.

### 128 Mathematics

### 123, 224, 225 Mathematical Analysis I, II, III 5(5,0), 4(4,0), 3(3,0), FSSu

Plane analytic geometry, limits, derivatives of algebraic functions, applications of differentiation to extrema of functions, sketching of graphs, and selected physical applications; antiderivatives, definite integrals, fundamental theorem of calculus, applications of integration to area, volume, and selected physical applications. Calculus of exponential, logarithmic, trigonometric, and inverse functions, methods of integration, polar coordinates, arc length, 2 and 3 dimensional vectors, solid analytic geometry. Indeterminate forms, improper integrals, Taylor's formula, infinite series, vector values and functions, partial derivative, multiple integrals, selected physical applications. P, 1 1/2 units of high school algebra, 1/2 unit of trigonometry, or 113.

### 215 Matrix Algebra 2(2,0) FS

An introduction to vectors, matrices, and determinants with applications to linear mathematical problems. Linear transformations of n-dimensional Euclidean space and their matrix representations. P, 113 or consent.

### 222 Calculus for Non-Math Majors 5(5,0) FSSu

An intuitive approach to functions, limits, calculus of algebraic, exponential and logarithmic functions, functions of several variables, applications of the derivative and integral. Credit will not be allowed for both Math 222 and Math 123. P, 111 (with B or A) or 113.

### 241 Mathematics of Finance 3(3,0) S

Application of algebra to problems in involving simple and compound discount including annuities, amortization, sinking funds, valuation of bonds, depreciation and capitalized cost. P, 111, or consent.

### 243 Discrete Mathematics 3(3,0) S

The study of sets and functions, binary relations including trees, state graphs and automata, discrete probability, recurrence systems, analysis of algorithms and algebras. P 113,271 or CSc 114 or 312.

### 271 Computer Programming & Data Processing 4(3,2) FS

An appreciation of the use of computer use for non-engineers. FORTRAN programming, flow charting, data processing techniques, evaluation of computer hardware, binary arithmetic, elementary numerical analysis and optimization applications. P, 111 (with C or better) or equivalent.

### 313 Modern Algebra 3(3,0) FS

Groups, rings and fields. Homomorphism theorems. P, 224, 353 or consent.

### 315 Linear Algebra 3(3,0) FS

Vector spaces, linear transformations and matrices. P, 215, 353 or consent.

### 321 Differential Equations 3(3,0) FSSu

Ordinary differential equations including first order, higher order linear and systems of linear equations. General solutions and solutions to initial-value problems using matrices, Laplace transforms (in engineering sections) and power series and applications to physical science and geometry. P, 225.

### 331 Advanced Engineering Math 3(3,0) FSSu

Fourier series, vector analysis, matrices, determinants, and topics selected from : complex variables, partial differential equations, numerical methods. P, 321.

### 353 Elementary Logic & Set Theory 2(2,0) FS

Logical connectives, constants, variable, quantifiers, arguments, and proof. Set operations, index sets, relations, functions, cardinality, and mathematical induction. P, 123.

### 355 Topics in School Math 3(3,0) FS

Techniques, materials and resources for teaching mathematics to junior high school and high school students. Required of majors planning to teach. P, Math 224 or consent.

### 361 College Geometry 3(3,0) F

A modern approach to Euclidean and non-Euclidean plane geometry. P, 224 or consent.

### 373 Intro to Numerical Computation 3(3,0) F

Mathematical models, algorithms, sources of error, computer solution of systems of linear equations, non-linear equations; quadrature, approximation, and interpolation using the computer. P, Math 224, and knowledge of FORTRAN IV.

### 381 Mathematical Statistics 4(4,0) FSSu

Statistical methods and probability, related to engineering and physical sciences. Common single and multiple variable densities and moment generating functions. Applications of random sampling to hypothesis testing, confidence limits, correlation, and regression. P, 225 or consent.

### 411 Theory of Numbers 3(3,0) S

Divisibility, greatest common divisor, least common multiple, Euler's  $r(n)$ ,  $o(n)$ , perfect numbers, Diophantine equations, congruences, Fermat's theorem, Wilson's theorem, quadratic residues, primitive roots, Pell's equations, continued fractions, distribution of primes. P, 224, 353.

**425-426 Intro to Real Analysis I-II 3(3,0) FS**

Topology of  $n$ -space, inner product, norm, Heine-Borel Theorem, convergence and uniform convergence. Cauchy criterion,  $\liminf$ ,  $\limsup$ , double and iterated sequences, continuity, uniform continuity, derivatives in  $\mathbb{R}^p$ , directional derivatives, partial derivatives, Riemann-Stieltjes integral content, integration in  $\mathbb{R}^p$ , Green's Theorem, improper and infinite integrals, infinite series, power series,  $M$ -Test. P, 225, 353.

**433 Laplace Transform 3(3,0) (On demand)**

Main features of Laplace transform theory. P, 321 or consent.

**461 Intro to Topology 3(3,0) F**

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 continuity of functions. P, 225, 353.

**490 History of Mathematics 3(3,0) S**

A general presentation of historical topics in mathematics emphasizing contributions to mathematics from ancient civilizations; developments leading to the creation of modern geometries, calculus and modern algebra; and contributions of outstanding mathematicians. P, 224 or consent.

**491 Directed Studies 1-3(1-3,0) FSSu****493 Special Topics 1-3(1-3,0) FSSu****494-495-496 Cooperative Education/Internship/Field Experience 1-6 FSSu**

Planned and supervised professional experience related to mathematics which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

## Graduate Courses

**521-621 Complex Variables 4(4,0) F (On demand)**

Algebra of complex numbers, classifications of functions, differentiation, integration, mapping, transformations, and infinite series. P, 225.

**523-524 — 623-624 Advanced Calculus 3(3,0) FS (On demand)**

Set theory, real number system, topology of Cartesian  $n$ -space, convergence, continuous functions; differentiation, integration, and infinite series. P, 225 or equivalent.

**527-627 Vector Analysis 3(3,0) (On demand)**

Vector algebra, vector functions, vector calculus with emphasis on various physical applications. P, 225.

**531-631 Partial Differential Equations 3(3,0) S (On demand)**

Series, solutions, total differential equations, simultaneous equations, approximate solutions, partial differential equations of first and second orders, application. P, 321.

**566-666 Projective Geometry 3(3,0) S (On demand)**

A synthetic and/or analytic approach to geometric properties invariant under projective transformations: Theorems of Desargues, Pascal, Brianchon and applications. P, 224 or consent of instructor.

**571-671 Numerical Analysis 3(3,0) F**

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, 321.

**572-672 Numerical Analysis 3(3,0) S**

Continuation of 571-671 including approximation theory, matrix iterative methods and boundary value problems for ordinary and partial differential equations. P, 571-671.

**583-683 Theory of Probability 3(3,0) F**

Topics in probability emphasizing applications including an introduction to axiomatic probability, random variables, and discrete stochastic processes such as random walks, Markov chains, and queueing theory.

**790 Thesis 5-7 as arranged****790 Special Problems 1-3 FSSu****793-794 Advanced Topics 1-3(1-3,0) FS**

Mechanical Engineers have a remarkable range of career directions from which they can choose. They can work in research, development, design, testing, manufacturing, operations and maintenance, marketing and sales, or in management and administration. They can work in industry, business, government or in educational institutions. They can also work with other professions such as law and medicine. Mechanical Engineers are employed in almost all industries including automotive, chemical, aircraft/aerospace, power, petroleum, computer, machinery (industrial, farm, office), rubber, electronic, textile, pharmaceutical, paper products and many others. Their work takes them to many parts of the world; they can probe the depths of the oceans or explore outer space as astronauts. Mechanical Engineering is an exciting profession which offers breadth, flexibility and individuality to those who want challenge and satisfaction rather than just a job.

Mechanical Engineers are also concerned with the needs of people and society. They deal with the physical aspects of human life applying their knowledge towards making life better and towards the solution of socio-humanistic problems. Mechanical Engineers are concerned, involved and want to accomplish a better world.

Mechanical Engineering can be classified by three general areas; Energy, Design and Manufacturing. The curriculum is made up of five categories or kinds of courses. These are: Basic Sciences, Engineering Sciences, Design, Communications and Socio-Humanistic. The Basic Sciences of mathematics, physics and chemistry provide the foundation for all engineering and technical courses. The Engineering Sciences are: solid mechanics, fluid mechanics, thermodynamics, heat transfer, systems and controls, materials, electrical fields and others. These courses are analytical in nature and use mathematical modeling to represent engineering problems. In the Design category, the student is introduced to the systems approach of solving problems where ideas, imagination, modeling and analysis are joined together to create a new component or a new product. Communications courses include english, graphics and computer languages. Courses from the Socio-Humanistic areas are also required in our curriculum. Some of these are: sociology, history, psychology, economics, religion and others. These courses provide a rounded education which will enable Mechanical Engineers to understand their culture and their fellow men.

In the senior year, opportunity is given for considerable specialization in various technical-option areas according to the student's interest and abilities. These include aerospace engineering, thermal engineering, industrial engineering, machine design, nuclear engineering, and environmental engineering. Elective courses are provided to allow this flexibility in the curriculum. Technical electives must be approved by advisors, and must total at least 11 credits, including two elective design courses.

Six credits of Humanities and nine credits of Social-Science electives are required and are to be selected from courses listed in the Humanities and Social-Sciences sections under the Graduation Requirements in this catalog. These electives also have to satisfy the requirements of EAC/ABET for depth in the humanities and social-sciences. The laboratory program supports and supplements the classroom lectures with experimental work. Here, students learn to perform tests, collect and analyze data, compare with theory and arrive at conclusions. Also students develop a report writing capability which will be very valuable to them in their future careers.

The department will help interested students arrange cooperative work/study programs with industry. Credit may be obtained for these work experiences, by prior arrangement with the appropriate faculty member, by registering for ME 494, Cooperative Education. Only in exceptional cases, however, will these credits fulfill part of the minimum technical-elective requirements above. See the Cooperative Education Program section under Academic Support Services in this catalog for more information on cooperative programs at SDSU.

In addition to the Graduation Requirements and Academic Performance Requirements specified in this catalog, the following

# Mechanical Engineering (ME)

## College of Engineering

Professor H.S. Ghazi, Acting Head, K.D. Christianson, C. Knofczynski; Associate Professors, P.E. Botros, J.N. Maytum, R.P. Mikesell, B.A. Sayar; Assistant Professor F. Delfanian; Instructors (on leave) K.D. Bassett, C. Remund.

grade requirements must be met to earn a Bachelor of Science Degree in Mechanical Engineering: an average grade of C or better is required in courses taken in the Mechanical Engineering and Mathematics Departments, considered as a single group. In addition, a grade of C or better, must be earned in each of these courses: EM 221, EM 222, EM 321, EM 331, ME 311 and ME 312.

To make the transition easier for high school students interested in a career in Mechanical Engineering, the following guidelines are suggested: study as much mathematics as available, including calculus (if possible), one year of physics, one year of chemistry and four years of english.

### Curriculum in Mechanical Engineering.

The Mechanical Engineering Program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET).

136 Semester Credits Required for the Bachelor of Science degree

#### Freshman Year

Mathematical Analysis I-II Math 123-224 .....	5	F
General Chem, Chem 112-114 .....	4	F
Fr Comp, Engl 101, or Speech, SpCm 101 (either order) .....	3	F
Engineering Design Graphics I-II, EG 121-122 .....	2	F
General Physics I, Phys 211 .....	4	F
Fitness & Lifetime Activities, PE 100 .....	1	F
Orientation for Engineers, GE 110 .....	0	F
Electives .....	2	F

#### Sophomore Year

Mathematical Analysis III, Math 225 .....	3	F
General Physics II, Phys 213 .....	4	F
Statics, EM 221 .....	3	F
Metal Processing, ES 225-235 .....	1	F
Introduction to Programming with FORTRAN, CSc 213 .....	3	F
Electives .....	4	F
Differential Equations, Math 321 .....	3	F
Dynamics, EM 222 .....	3	F
Engineering Materials, ME 241 .....	3	F
Atomic Physics, Phys 331 .....	3	F
Macroeconomics Principles, Econ 201 .....	3	F

#### Junior Year

Mechanics of Materials, EM 321 .....	3	F
Fluid Mechanics, EM 331 .....	3	F
Adv. Eng. Math; Math 331, or Math. Stat., Math 381 .....	3 or 4	F
Technical Communications, Engl 303 .....	3	F
Thermodynamics I-II, ME 311-312 .....	3	F
Heat Transfer, ME 415 .....	3	F
Basic Electrical Engineering I-II, EE 305-306 ..	3	F
Kin. & Dyn. of Mach. Elements, ME 321 .....	3	F
Mechanical Engineering Lab I, ME 376 .....	2	F
Electives .....	2	F

#### Senior Year

Design of Machine Elements, ME 421 .....	4	F
Metallurgy, ME 341 .....	3	F
Automatic Controls, ME 451 .....	3	F
Mechanical Engineering Lab II- ME 476 .....	1	F
Mechanical Systems Design Projects ME 477 ..	2	F
Computer Applications, ME 422 .....	2	F
Electives .....	6	F
Inspection Trip, ME 480 .....	0	F

#### Suggested Elective Groups

<b>Aerospace Engineering</b>	
Aerodynamics, ME 431 .....	3
Advanced Engineering Math, Math 331 .....	3

Advanced Fluid Mechanics, EM 531 .....	3
Gas Dynamics I, ME 531 .....	3
Internal Combustion Engines, ME 412 .....	3
Turbomachinery, ME 413 .....	3
Structural Theory, CE 353 .....	3
Thermo-Fluid Energy System, ME 512 .....	3
Viscous Flow Theory I, ME 532 .....	3

#### Environmental Engineering

Heating, Ventilating & Air Conditioning I, ME 411 .....	3
Heating, Ventilating & Air Conditioning II: Design, ME 419 .....	3
Environmental Chemistry, Chem 380 .....	4
Environmental Engineering, CE 523 .....	3
Environmental Conservation, WL 210 .....	2
Physical Climatology & Meteorology, AE 353 .....	3
Water Supply Engineering, CE 327 .....	4

#### Industrial Engineering

Industrial Engineering, ME 362 .....	3
Analysis & Design of Industrial Systems, ME 461 .....	3
Mathematical Statistics, Math 381 .....	4
Intro to Operations Research, ME 561 .....	3

#### Machine Design

Machine Design, ME 428 .....	2
Vibrations, ME 322 .....	3
Advanced Engineering Math, Math 331 .....	3
Modeling & Simulation, ME 521 .....	3
Applied Stress Analysis, ME 522 .....	3
Theory of Elasticity, EM 522 .....	3
Theory of Plasticity, EM 523 .....	3
Theory of Plates & Shells, EM 524 .....	3
Finite Element Analysis, EM 541 .....	3

#### Nuclear Engineering

Atomic & Molecular Spectra, Phys 437 .....	3
Introductory Nuclear Physics, Phys 433 .....	3
Reactor Physics, Phys 535 .....	3
Advanced Engineering Math, Math 331 .....	3

#### Thermal Engineering

Heating, Ventilating & Air Conditioning I, ME 411 .....	3
Heating, Ventilating & Air Conditioning II: Design ME 419 .....	2
Internal Combustion Engines, ME 412 .....	3
Design of Thermal Systems, ME 418 .....	3
Turbomachinery, ME 413 .....	3
Thermo-Fluid Energy Systems, ME 512 .....	3
Viscous Flow Theory I, ME 532 .....	3

### Undergraduate Courses

#### 241 Engineering Materials 3(3,0) FS

Structure of metals, including atoms, perfect and imperfect crystals and phases. Effect of mechanical stresses, thermal reactions, magnetic fields and corrosion on microstructure. Phases and mechanical behavior of ceramics. Linear and three dimensional polymers and deformation of polymeric materials. P, ES 225, Chem 114.

#### 311-312 Thermodynamics I & II 3(3,0)F 3(3,0) S

Thermodynamic properties of gases, vapors and mixtures. First and Second Laws of Thermodynamics. Concepts of availability, irreversibility and equilibrium. Stoichiometry. Engineering application of principles basic to thermodynamic cycles, compressible flow through nozzles and turbine blades and power and refrigeration systems. P, Phys 211, Math 225.

#### 313 Analytical Thermodynamics 3(3,0) FS

Thermodynamic properties and laws, statistical thermodynamics, kinetic theory and transport phenomena. Irreversible thermodynamics, applications to direct energy conversion devices. P, Phys 331, Math 321.

#### 314 Thermodynamics 3(3,0) FS

Terminal course for non-mechanical engineering students. Fundamental equations of thermodynamics. Properties of gases and vapors. Thermodynamic cycles. P, Phys 211, Math 225.

**321 Kinematics & Dynamics of Machine Elements 3(1,4) FS**

Analysis of motion and design of linkages, cams, gears, gear trains, planetary gear trains. Analytic and graphical solution of positions, velocities, accelerations, static and dynamic forces. Balancing of engine mechanism, flywheels analysis. Synthesis of planar mechanisms and introduction to spatial mechanisms. Intense computer applications. P, EG 122, EM 222, CSc 312.

**322 Vibrations 3(3,0)\***

Free and forced vibration of single-degree-of-freedom systems. Vibration measurement, transmission and isolation. Nonlinear effects. Multi-degree-of-freedom systems; matrix methods. Introduction to continuous systems and random vibration. P, EM 222, Math 321.

**341 Metallurgy 3(1,4) FS**

Crystalline structure and physical properties of metals, phase transformation diagrams, effect of mechanical or thermal treatment on grain structure of ferrous and non ferrous alloys. Laboratory demonstrates fundamental principles and presents necessary techniques of metallography. P, 241.

**361 Methods Engineering & Work Measurement 2(0,4)\***

Work methods design and measurement of industrial enterprises. Rigorous engineering approach to work methods design. Methods of setting time standards including stop watch time study, work sampling, predetermined motion times, and standard data. P, 362 or consent.

**362 Industrial Engineering (3,0)**

Modern industrial engineering. Planning, organizing and directing industrial enterprises. Quantitative analysis of management problems in production planning and control, quality control, reliability, facility planning and PERT. Applications and examples from realistic situations. P, CSc 312.

**376 Mechanical Engineering Lab I 2(1,3) S**

Instruments for measuring pressure, temperature, flow, strain, vibration and sound. Experimental data analysis for accuracy, error and uncertainty. P, 311.

**381 Mechanical Equipment of Buildings 3(3,0)\***

Heating, ventilation and air conditioning systems, control and servicing. Refrigeration, plumbing systems and their maintenance. Fire and explosion prevention in buildings. P, Phys 104 or consent.

**400 Seminar 1(1,0)\***

Recent research and development in mechanical engineering, related fields. P, senior standing.

**411 Heating, Ventilating & Air Conditioning I 3(3,0) F**

Comfort and health requirements for space conditioning. Psychrometrics, steady flow processes involving air-water vapor mixtures. Heating load calculations. Solar heating systems. Emphasis on systems design approach. P, EM 331, 312, concurrent 415.

**412 Internal Combustion Engines 3(3,0) F**

Theory, design and operation of spark ignition and compression-ignition engines. Combustion analysis, efficiencies and performance. Knock phenomena, exhaust gas analysis and air pollution. Use of equilibrium charts. P, 312 or 314.

**413 Turbomachinery 3(3,0) S**

Theory, design, operation and energy transfer in Turbomachines. Steam, gas and hydraulic turbines. Pumps, fans and centrifugal and axial flow compressors. P, 312.

**415 Heat Transfer 3(3,0) FS**

Basic principles of steady and unsteady conduction, free and forced convection and thermal radiation. Numerical methods and computer assisted solutions using matrix inversion and iteration schemes.

**418 Design of Thermal Systems 3(3,0) F**

Systems approach to design, mathematical modeling, simulation and optimization of systems, with particular emphasis on thermal systems. P, EM 331, ME 312, 415.

**419 Heating, Ventilating & Air Conditioning II: Design 3(2,2) S**

Cooling load calculations. Analysis of vapor compression and absorption cycles. Solar cooling. Analysis and design of complete heating and air conditioning systems. Use of computer programs as design aids. P, 411 or consent.

**421 Design of Machine Elements 4(4,0) FS**

Properties of materials, fundamental mechanics, working stresses, fabrication and proportioning of part sizes involved in design of fastenings, shafting, flywheels, gears, bearings, and other machine elements. P, EM 321, concurrent with 321.

**422 Mechanical Engineering Computer Applications 2(2,0) S**

Realistic applied problems will be selected from the range of departmental undergraduate courses for solution on computers. These problems will be chosen so that each requires, and demonstrates, a different mathematical, hence programming, technique. Optimization problems which relate to engineering design will be included. (P, CSc 213 and senior standing)

**428 Machine Design 2(0,6) FS**

Actual stress analysis and design of complex machines, using basic engineering concepts and modern industrial practices. Emphasis on originality and creativity; opportunity for students to select projects of particular interest. P, 421.

**431 Aerodynamics 3(3,0)\***

Airfoil characteristics, wing shapes, static and dynamic forces, viscosity phenomena, boundary layer theory, flaps and slots, propellers, stability, control and performance. P, EM 331.

**451 Automatic Controls 3(3,0) F**

Control systems and components. Laplace transform and transfer function. System analysis by frequency-response and root locus method. System compensation. Analog simulation. Application to hydraulic, pneumatic and electromechanical systems. P, 322, or consent.

**461 Analysis & Design of Industrial Systems 3(3,0)**

Problems in product design and development, marketing, forecasting, capacity evaluation, plant layout, materials handling from standpoint of interrelated and integrated systems. P, 362 or consent.

**476 Mechanical Engineering Lab II 1(0,3) F**

Continuation of ME 376, water analysis. Application of the laws of thermodynamics and fluid mechanics. Internal combustion engines and single and multi-stage compressors. Compressible fluid flow measurement and behavior in nozzles and orifices. Heat exchanger analysis. P, 376, 312; EM 331, concurrent with 415.

**477 Mechanical Systems Design Projects 2(1,3)S**

A systems approach to design covering need analysis, design phases, design processes, economics, optimization, and success criteria. Students will design, build, and test an independent project which must be different than any previous designs they have attempted. P, 476.

**480 Inspection Trip (0) FS**

Short inspection trips arranged to give students opportunity to observe and evaluate manufacturing and industrial processes, operations and facilities. P, senior standing.

**492 Special Problems 1-5\*****493 Special Topics 1-5**

May be analytical, design, or laboratory studies.

**494-495-496 Cooperative Education/Internship/Field Experience 1-6 FSSu**

Planned and supervised professional experience related to mechanical engineering which takes place outside the formal classroom with private business, industry, or public agencies. P, consent of department program coordinator.

\*On sufficient demand if faculty loads allow.

## Graduate Courses

**511-611 Statistical Thermodynamics 3(3,0)**

Review of classical thermodynamics. Principles of kinetic theory and classical statistical mechanics. Principles of quantum mechanics, quantum statistics, partition functions, and thermodynamic properties. P, 312, Math 321, Phys 331 or consent.

**512-612 Thermo-Fluid Energy Systems 3(3,0)**

Review of viscous fluid flow, basic modes of heat transfer and thermodynamic 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. P, 312, 415; Math 331 or equivalent.

**521-621 Modeling & Simulation of Dynamic Systems 3(2,3)**

Application of physical laws, mathematical methods and computers to the development and analysis of models of advanced dynamic systems of engineering interest. Analog simulation by using analog/hybrid EAI 380 computer. Digital logic and parallel hybrid simulation. Digital simulation by using FORTRAN and IBM System/370 digital computer. Continuous system simulation languages. Emphasis is on the methods of modeling and simulation rather than the systems modeled. P, Math 321 and consent.

**522-622 Applied Stress Analysis in Mechanical Design 3(3,0)**

Advanced solutions of practical stress analysis problems related to mechanical structures and machine components. Elasticity equations and energy theorems. Stresses in thin walled structures and stability analysis. Discrete structures by matrix force and matrix displacement methods. Continuous structures by finite element methods. Application to mechanical design problems. P, 421, Math 331 or consent.

**531-631 Gas Dynamics I 3(3,0)**

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, 213, EM 331, Math 331.

**532-632 Viscous Flow Theory I 3(3,0)**

Viscosity, types of fluid particle motion, shear stresses and stream function. Derivation of the Navier-Stokes equations. Viscous flow through different geometric channels. Lubrication theory. Turbulent viscous flow, Reynold's stresses and Reynold's equations. Prandtl's mixing length theory. Boundary layer theory. Exact and approximate solutions of the boundary layer equations. Hydrodynamic and thermal boundary layers.

**541-641 Advanced Metallurgy 3(3,0)**

Crystal lattices and diffraction by crystals. Structure determination, defects, registration by microscopic methods, single crystal orientation and stress analysis caused by phase transformation. P, 341, Math 321.

**551-651 Advanced Analytical Methods 3(3,0)**

Practical engineering differential systems are examples for developing solution techniques. Functional approximations, coordinate changes, numerical methods, integral solutions, orthogonal functions, and Green's functions are discussed. Solutions are related to the original engineering systems. P, Math 331 or permission.

**561-661 Intro to Operations Research 3(3,0)**

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. P, 362, Math 381 or consent.

**562-662 Quality Control & Reliability 3(3,0)**

Application of statistical techniques to control quality and development of economical inspection methods. Collection, analysis, and interpretation of operations data; control charts and sampling procedure. P, 362, Math 381 or consent.

**563-663 Topics in Reliability Engineering 3(3,0)**

Probability concepts and typical models involved in 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. P, 662 or consent.

**690 Special Problems 1-5****695 Special Topics 1-3****711 Advanced Heat Transfer I 3(3,0)****728 Advanced Machine Design 3(3,0)****731 Gas Dynamics II 3(3,0)****751 Computer-Aided Design 3(3,0)****761 Decision Theory 3(3,0)****762 Systems Analysis 3(3,0)****790 Thesis 5-7 as arranged****794 Special Problems 1-3****795 Special Topics 1-3**

## Mechanized Agriculture (MA)

### College of Agriculture and Biological Sciences

Professor Hellickson, Head; Professors Chu, DeBoer; Professor Emeritus DeLong, Lubinus, Moe, Wiersma; Associate Professors Durland, Lytle, Ullery, Werner; Assistant Professors Alcock, Bender, Cluever, Froehlich Julson, Lush, Schipull, Stange; Assistant-in-Bischoff.

Mechanized agriculture is a four-year major developed around the General Agriculture core curriculum. It is designed to give broad training in both Agricultural Sciences and Agricultural Mechanization. It prepares you for farm management, extension work, farm machinery and equipment sales, sales or contracting enterprises, farming, electric power use, work with federal agencies such as Soil Conservation Service, Agricultural Loan officer with banks, food and food processing plants, vocational agriculture teachers in multiple teacher programs, and other fields related to Agriculture. Cooperative Education and Industry Cooperative Programs are available in the department. Arrangements may be made for some credit under MA 494-495-496, Cooperative Education/Internship/Field Experience.

### Curriculum in Agriculture, Mechanized Agriculture Major Leading to the Bachelor of Science degree

	F	S	Credit
<b>Freshman Year</b>			
Fr Comp, Engl 101, Speech, SpCm 101 .....	3		3
Welding, ES 131 .....			2
Fitness & Lifetime Activities, PE 100 .....	1		1
General Chemistry, Chem 110 or 112-114 .....	4		
Algebra and Plane Trigonometry, Math 111-120 or Math 113 .....	3		3-5
Machine Shop, ES 121 .....	2		
Biological Science electives† .....			3
Agricultural Mechanics, MA 202 .....	2		
Introduction to Sociology, Soc 100 .....			3
<b>Sophomore Year</b>			
Chemistry elective (Not Chem 100) .....	3		
Mathematics of Finance, Math 241 .....	3		
Engineering Design Graphics, EG 121 .....	3		
Soils, PS 113 .....			3
Farm Power & Machinery, MA 213 .....	3		
Introduction to Computers and Programming, CSc 311 .....			3
Principles of Actg I, Actg 210 .....			3
Group I elective* .....	6		3
Humanities Elective‡ .....			3
<b>Junior Year</b>			
Junior Composition, Engl 300** .....			3
Electricity for Farm and Home, MA 342 .....	2		
Econ 201 or Econ 202 .....	3		
Soil & Water Mechanics, MA 333 .....			3
Elementary Physics I-II, Phys 111-113 .....	4		4
Elective & Option courses .....	4		4
Humanities Elective‡ .....	3		
Communication Elective** .....			2
<b>Senior Year</b>			
Farm Building Mechanization, MA 423 .....			3
Processing, Equipment & Agricultural Products, MA 443 .....	3		
Physical Climatology & Meteorology, AE 353 .....			3
Business Law, B-Ad 350 .....	3		
Technical elective*** .....	3		
Elective .....			3
Seminar, AE 471 .....	1		
Elective & option courses .....	6		3
Energy and Agricultural Technology, MA 492 .....			3
Agricultural Waste Management, MA 463 .....	3		

\* Students majoring in Mechanized Agriculture may not use Mechanized Agriculture courses to satisfy the Group I requirements. Group I requirements include Plant Science 113 plus 9 additional credits from Group I.

\*\* See College of Agriculture and Biological Science Core Curriculum Requirements. "C" grade required in Engl 300 or you must pass writing in the Sciences, Engl 307. †Courses must be selected from the following areas: Botany, Biology, Entomology-Zoology, Plant Science, Microbiology.

\*\*\*Technical electives must be selected from the approved list provided. ‡See University Core Requirements.

In addition to above courses a minimum of 15 semester hours under the Business, Science, Irrigation Equipment, Processing and Agricultural Education options is required. The elective program must be planned with the adviser and approved by the department head.

**Business Option**

Course	Credits
Microeconomics Principles, Econ 202 .....	3
Money and Banking, Econ 330 .....	3
Business Management, B-Ad 360 .....	3
Statistical Methods I, Stat 341 or equivalent .....	3
Business Finance, B-Ad 310 .....	3
Business Elective .....	3
Farm & Ranch Management, Ag Econ 271 .....	4

## Science & Production Option

Course	Credits
General Microbiology, Micr 231.....	4
Biological Science electives.....	7
Chemistry.....	7
Mathematics and/or Physics.....	4
Science electives.....	6
Animal Science electives.....	9
Plant Science electives.....	9
Small Power Equipment, MA 433.....	2

## Irrigation Option

Course	Credits
Forage Crops and Pasture Management, PS 313.....	3
Soil Fertility & Fertilizers, PS 323.....	3
Vegetable Growing, Hort 212.....	3
Conservation & Management of Soils, PS 372.....	2
Physical Environment of Soils & Plants, PS 352.....	2
Irrigation, PS 483.....	3
Geology, PS 243.....	3
Principles of Plant Pathology I, PS 223.....	3
Plant Kingdom, Bot 201.....	3
Elementary Surveying, CE 106.....	3
Mathematics and/or Physics, Chemistry.....	6

## Equipment & Processing Option

(15 credits to be selected from following courses)

Course	Credits
Grain & Seed Production & Processing, PS 312.....	2
General Microbiology, Micr 231.....	4
Food Microbiology, Micr 311.....	3
Dairy Product Processing I, DS 321.....	5
Vegetable Growing, Ho 212.....	3
Principles of Plant Pathology I, PS 223.....	3
Meat & Meat Processing, AS 241.....	3
Meat Processing Lab, AS 242.....	1
Experimental Foods, NFS 341.....	3
Experimental Testing & Development in Food Science, NFS 342.....	3
Dairy Plant Management, DS 421.....	3
Small Engines and Equipment MA 433.....	2

## Vocational Agriculture Teacher Option\*

Course	Credits
General Psychology, Psysc 101.....	3
Educational Psychology, EPsysc 302.....	3
Agricultural Education Seminar, AgEd 301.....	1
Summer Experience, AgEd 470.....	1
Principles of Vocational Education & Practical Arts, VTTE 405.....	2
Program Planning in Vocational Agriculture, AgEd 404.....	4
Special Methods in Vocational Agriculture, AgEd 434.....	3
Teaching Agricultural Mechanics, AgEd 454.....	2
Student Teaching in Agricultural Education, AgEd 475.....	8
Indian Studies, Anth 421 or History, Hist 368.....	3
Teaching of Reading, SeEd 450.....	3

\* Option credits may be applied to a double major in Agricultural Education. A degree in Ag.Ed. is presently required for teaching certification in South Dakota. Students should check with the Ag.Ed. office by the end of the Sophomore year to find out the specific certification requirements for the particular state that they plan to teach in.

## Technical Electives

Business Finance, B-Ad 310.....	3
Personal Finance, B-Ad 380.....	3
Small Engines and Equipment, MA 433.....	3
Microcomputer Appl. in AE, AE 372.....	2
Special Problems, MA 492.....	1-3
Coop. Education, MA 494 or 495 or 496.....	1-3
Any 300 or higher level course in Animal and Range Sciences, Plant Science; excluding Group 1 courses.....	3

MINOR REQUIREMENTS: MA 202, 213, 333, 342, plus 6 hours from the following: MA 423, 433, 443, 463, and 490.

## Undergraduate Courses

### 202 Agricultural Mechanics 2(1,2) FS

Wood and concrete building materials; efficient construction procedures; hand tools, portable and stationary power tools; safe working practices.

### 213 Farm Power & Machinery 3(2,2) FS

Tractors and farm machinery from the standpoint of operation, repair, preventative maintenance, safety, cost of operation, and efficiency. Theoretical and practical aspects of calibration, hydraulic systems, fuels, lubricants, and power trains. Sophomore standing.

### 252 Auto Mechanics 2(1,2) FS

Engine tune-up, servicing and repairing engine accessories; testing valves, carburetors, ignition systems; installing new rings, valves, and general work required of mechanics.

### 333 Soil & Water Mechanics 3(2,2) FS

Engineering phases of soil and water conservation; elementary measurements and surveying and application to field problems; design and layout of conservation, drainage and irrigation practices.

### 342 Electricity for Farm & Home 2(1,2) FS

Basic wiring, electrical circuits, controls, lighting, electric motor selection and operation. Electric distribution system design, including wire and service entrance sizing.

### 423 Farm Building Mechanization 3(2,2) FS

Materials and construction techniques for farm buildings. Special attention to planning mechanization of livestock housing facilities, feeding operations, and manure removal systems.

### 433 Small Engines and Equipment 2(1,2) S

Selection, operation and maintenance of internal combustion powered equipment developing up to 15 horsepower. Engine disassembly, assembly and tune-up. Set-up and adjustment of associated pieces of equipment and accessories.

### 443 Processing Equipment for Agricultural Products 3(2,2) F

Mechanics, refrigeration, heat transfer, instrumentation, and equipment operation as applied to materials, handling, storing, preserving, packaging and processing agricultural products.

### 452 Teaching Agricultural Mechanics 2(1,3) FSSu

Shop management, safety, shop plans, selection, care, and use of hand and power tools and equipment to be taken as part of student teaching block in Agricultural Education. P, senior in agricultural education. Offered first half of semester. P, MA 202.

### 463 Agricultural Waste Management 3(3,0) F

Agriculturally related pollution and waste problems. Regulations and techniques for collecting, handling, treating and disposing of agricultural wastes to minimize environmental pollution. Design and management of agricultural water systems. P, PS 113, Phy 101 or 111 Instructor consent.

### 482 Energy & Agricultural Technology 3(3,0) S

Evaluation of local, regional, national and world energy resources and their relation to the agricultural industry. Energy conversion, technology, conservation and management. Future energy source and energy from agricultural products. P, senior standing or instructor consent.

### 492 Special Problems 1-3

Must have approval of adviser and department head.

### 494-495-496 Cooperative Education/Internship/Field Experience 1-12 FSSu

Planned and supervised professional experience related to mechanized agriculture which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

## Graduate Courses

500-600 Special Topics (4-day workshops, 6 hrs per day) On Sufficient demand.

A. Agricultural Machinery, B. Soil and Water Mechanics, C. Small Power Units, D. Agricultural Power Units, E. Electric Motors and Electrical Controls, F. Agricultural Structures and Environment, G. Welding. Primarily designed for in-service teacher training activities for Vocational Agriculture teachers. Workshops held at several points in state.

### 512-612 Advanced Farm Machinery 2(1,3) Su (Offered in 1986)

Operation, care, adjustment, new developments in farm machinery, with emphasis on field and farm machinery, with emphasis on field and farmstead machinery as related to needs of agricultural production. Alternate years.



**522-622 Advanced Farm Structures 2(1,3) Su** (Offered in 1986)

Materials for farm construction; construction methods and techniques; new developments in farm building. Alternate years.

**542-642 Advanced Rural Electrification 2(1,3) Su** (Offered in 1987)

Operation, selection, care, adjustment, and new developments in rural electric equipment; motors, fans, controls, wiring, pumps, grain handling equipment, and home and classroom lighting. Alternate years.

**562-662 Advanced Irrigation Mechanics & Practices 2(1,3) Su** (Offered in 1987)

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. Alternate years.

**582-682 Advanced Farm Engines 2(1,3) Su** (Offered in 1987)

Operation, selection, care, adjustment, and new development of internal combustion engines as applied to farm power units. Alternate years.

## Microbiology (Micr)

### College of Agriculture and Biological Sciences

Professor Todd, Head; Professors Pengra, Sword, Westby; Professors Emeritus Baker, Semeniuk; Associate Professors Hillam, Kirkbride; Assistant Professors Gauger, Shave, Torrey, Westfall.

The curriculum is designed to provide basic knowledge in the sciences as well as a liberal arts education. The faculty will acquaint you with specialties such as environmental, food, soil, and medical microbiology as well as immunology.

Three curricula are available through the department. A Bachelor of Science in Agriculture, major in Microbiology, and a Bachelor of Science in Biological Science, major in Microbiology, are offered in the College of Agriculture and Biological Sciences. A Bachelor of Science with a major in Microbiology is also available in the College of Arts and Science.

Graduates are equipped for technical work in a variety of jobs such as in diagnostic and research laboratories, public health, food industry, pharmaceutical companies, etc. With the recommended electives the graduate is prepared to enter graduate school to pursue a Master's or Doctor's degree.

Departmental requirements are held to a minimum to allow for greater flexibility in the individual's development. Many students select a second major in either Medical Technology (CLT), Chemistry, Biology, or Health Science. A microbiology major is often taken along with the pre-professional programs of Medicine, Dentistry and Veterinary Medicine. The goal is to provide a sound but varied educational experience with a specialty in Microbiology.

A major in Microbiology is offered with satisfactory completion of 28 credits in Microbiology, including General Microbiology (Micr 231), Microbial Physiology (Micr 332) and Immunology (Micr 422).

Completion of 16 cr (to include Micr. 231, and either Micr. 332 or Micr. 422) can constitute a minor.

In addition, Chem 112-114, Chem 222-224 (or Chem 120 plus an approved chemistry elective) and Chem 260 are required for a major.

A minimum GPA of 2.0 must be maintained for the required 28 credits in Microbiology and for the required 20 credits of Chemistry.

**Curriculum in Agriculture; Microbiology Major**

Leading to the Bachelor of Science degree

	Credit	
	F	S
<b>Freshman Year</b>		
Fr Comp, Engl 101.....	3	or 3
Algebra & Trigonometry, Math 113 (or Algebra, Math 111 & Plane Trigonometry, Math 120).....	5	
Fundamentals of Speech, SpCm 101.....	3	or 3
General Chemistry, Chem 112-114.....	4	4
Intro Biology, Bio 151-153.....	3	3

Fitness & Lifetime Activities, PE 100.....	1	1
*Calculus for non-Math Majors, Math 222 (or general elective).....		5
<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Soils, PS 113.....		3
Organic Chemistry, Chem 222-224 (or Organic Chemistry, Chem 120 & Chem elective).....	4	4
General Microbiology, Micr 231.....	4	
Microbial Physiology, Micr 332.....		4
Macroeconomics Principles, Econ 201.....		3
Introduction to Sociology, Soc 100.....	3	
Group I Agriculture electives.....	3	
Communications elective (approved list).....	3	
Elective.....		2

<b>Junior Year</b>	<b>F</b>	<b>S</b>
Elementary Physics, Phys 111-113.....	4	4
Group I Agriculture electives.....	3	3
Humanities electives (approved list).....	3	3
Microbiology elective.....	3	3
Junior Composition, Engl 300.....		3
Immunology, Micr 422.....	4	
Social Science elective (approved list).....		3

<b>Senior Year</b>	<b>F</b>	<b>S</b>
Seminar, Micro 440.....	1	1
Genetics, Bio 371.....	3	
Microbiology electives.....	4	4
Biochemistry, Chem 260.....		4
Electives (recommended Quantitative Analysis, Chem 232; Statistical Methods I, Stat 341; Computer Programming CSc 112 or CSc 114).....	8	7

**Curriculum in Arts and Science, Microbiology Major**  
Leading to the Bachelor of Science degree

	Credit	
	F	S
<b>Freshman Year</b>		
Fr Comp, Engl 101.....	3	or 3
Fundamentals of Speech, SpCm 101.....	3	or 3
General Chemistry, Chem 112-114.....	4	4
Intro Biology, Bio 151-153.....	3	3
Fitness & Lifetime Activities, PE 100.....	1	1
Algebra & Trigonometry, Math 113 (or Algebra, Math 111 & Plane Trigonometry, Math 120.....	5	
Electives (recommended Calculus for non-Math Majors, Math 222 & Statistical Methods I, Stat 341).....		5

<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Organic Chemistry, Chem 222-224 (or Organic Chemistry 120 & Chem elective).....	4	4
General Microbiology, Micr 231.....	4	
Microbial Physiology, Micr 332.....		4
Genetics, Bio 371.....	3	
Social Science electives (approved list).....	3	3
Electives (Foreign Language recommended).....	2	5

<b>Junior Year</b>	<b>F</b>	<b>S</b>
Junior Composition, Engl 300.....		3
Elementary Physics, Phys 111-112.....	4	4
Humanities electives (approved list).....	3	6
Biochemistry, Chem 260.....	4	
Microbiology elective.....	3	3
Immunology, Micr 422.....	4	
Electives.....	1	2

<b>Senior Year</b>	<b>F</b>	<b>S</b>
Seminar, Micr 440.....	1	1
Microbiology electives.....	4	4

Social Science electives (approved list).....	3	3
Electives (recommend Quantitative Analysis, Chem 232; Computer Programming CSc 112 or CSc 114; Microbiology Problem, Micr 441, 1-3 Cr.).....	8	8

See College of Arts and Science for core curriculum requirements.

The required courses and recommended electives will provide an excellent background for graduate studies. One year of Organic Chemistry is required before entering the Microbiology Graduate Program.

### Curriculum in Biological Science, Microbiology Major Leading to the Bachelor of Science Degree

		Credit
	F	S
<b>Freshman Year</b>	F	S
Fr Comp, Engl 101.....	3	or 3
Fundamentals of Speech, SpCm 101.....	3	or 3
Biology, Bio 151-153.....	3	3
General Chemistry, Chem 112-114.....	4	4
Fitness & Lifetime Activities, PE 100.....	1	1
Algebra & Trigonometry, Math 113 (or Algebra, Math 111 & Plane Trigonometry, Math 120).....	5	5
*Calculus for non-Math Majors, Math 222 (or general elective).....	5	5
<b>Sophomore Year</b>	F	S
Organic Chemistry, Chem 222-224 (or Or- ganic Chemistry, Chem 120 & Chem elec- tive).....	4	4
*Statistical Methods I, Stat 341 (or general elective).....	3	3
Genetics, Bio 371.....	3	3
General Microbiology, Micr 231.....	4	4
Microbial Physiology, Micr 332.....	4	4
Macroeconomics Principles, Econ 201.....	3	3
Introduction to Sociology, Soc 100.....	3	3
Communication elective (approved list).....	3	3
Elective.....	2	2
<b>Junior Year</b>	F	S
Elementary Physics, Phys 111-113.....	4	4
Humanities electives (approved list).....	3	3
Junior Composition, Engl 300.....	3	3
Immunology, Micr 422.....	4	4
Biochemistry, Chem 260.....	4	4
Microbiology elective.....	3	3
Social Science elective (approved list).....	3	3
Elective.....	2	2
<b>Senior Year</b>	F	S
Seminar, Micr 440.....	1	1
Microbiology electives.....	4	4
*Quantitative Analysis, Chem 232 (or general elective).....	4	4
*Computer Programming, CSc 112 or CSc 114.....	4	4
Elective (recommend 1-3 credits of Microbi- ology Problem, Micr 441).....	7	7

\*These courses are highly recommended for the undergraduate preparing for Graduate School. One year of Organic Chemistry is required for acceptance into the Microbiology Graduate Program.

### Undergraduate Courses

- 231 General Microbiology 4(2,4) FS**  
Principles of basic and applied Microbiology. P, Chem 100, 110 or 112.
- DS 301 Dairy Microbiology 3(2,3) S**  
(See description in Dairy Science.)

- 310 Environmental Microbiology 4(2,4) S**  
Microbiology of water, air and surfaces in man's environment. Standard methods for detecting and controlling pathogens and non pathogens. P, 231.
- 311 Food Microbiology 4(2,4) F**  
Microbiology of fresh and processed meats, dairy products, vegetables and modern convenience foods. Laboratory quality study of food preservation, processing and spoilage. P, 231.
- 332 Microbial Physiology 4(2,4) S**  
Morphology, cytology, nutrition, metabolism, genetics and growth of microbial cells. P, 231.
- 412 Soil Microbiology 3(2,3) S**  
Microbial species of agricultural soils and biochemical changes brought about by these microorganisms. P, 231.
- 422 Immunology 4(3,3) F**  
Immunology and immunochemistry, mechanisms of immunologic injury, and their application to clinical immunobiology. Serological techniques for detecting and measuring the presence of antigens or antibodies in specimens and production of immune serum. P, 231.
- 423 Pathogenic Microbiology 4(2,4) FS**  
Host-parasite relationships, pathogenesis, pathology, laboratory diagnostic tests, and treatment of animal and human diseases. Laboratory study of morphology, cultural characteristics, and specific diagnostic techniques for the etiologic agents. P, 231.
- 440 Seminar 1(1,0) FS**  
Familiarization with the Microbiology profession and presentation of topics based on microbiological literature in scientific journals. Senior status or consent.
- 441 Microbiology Problem (1-3) FSSu**  
Microbiological problems associated with current research or teaching. Practical laboratory experience is encouraged for seniors majoring in Microbiology. 6 credits maximum. P, consent of instructor and senior standing.
- PS 453 Mycology 3(2,3) F**  
(See description in Plant Science.)
- Zool 467 General Parasitology 3(2,3) S**  
(See description in Biology)
- 494-495-496 Cooperative Education/Internship/Field Experience 1-12 FSSu**  
Supervised practical experience or internship in Microbiology. Prior arrangements must be made with a staff member to be eligible. A maximum of 4 credits will count toward minimum requirements of major. P, consent of instructor.
- 497 Special Topics (1-4) FS**  
Selected topics to provide specific knowledge and technical experience in current areas of research and development. P, senior standing and consent of instructor.

### Graduate Courses

- DS 522-622 Advanced Dairy Microbiology 3(2,3) S**  
(See description in Dairy Science.)
- 524-624 Virology 3(2,3) S**  
Viral characterization, structure and replication. Pathogenesis and pathology of viral diseases in man and animals. Laboratory exercises in viral structure, isolation and characterization. Pathology of animal viral infections. P, 422 or consent.
- 536-636 Molecular and Microbial Genetics 4(4,0) F**  
A basic course in molecular genetics. Examples to illustrate genetic principles are drawn from all forms of life. P, Bio 371. General microbiology recommended.
- 537-637 Systematic Bacteriology 4(2,4) F**  
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, 332 (or equivalent).
- 592-692 Advances in Microbiology 1-4 S**  
In-depth study of selected areas or specialties within Microbiology to strengthen and expand the current knowledge and technical skills of advanced undergraduate and graduate students in Microbiology. Prerequisites will vary depending upon the area studied. P, 231 and consent of instructor.
- 713 Industrial Microbiology 4(2,4) F** (Offered in 1987)
- 738 Microbial Metabolism 4(2,4) S** (Offered in 1988)
- 742 Graduate Seminar 1(1,0) S**
- 790 Thesis in Microbiology 5-7 FSSu**

# Military Science (Mil) (Army ROTC)

## College of Arts and Science

Professor of Military Science Smidt, head; Professor Emeritus Adams, Assistant Professors of Military Science: Browne, Byrne, Herbert, Hunzinger, and Instructors Banks and Branson

The Department of Military Science offers instruction and practical experience in leadership and management, the development of selected military skills and problem solving techniques, the role of the Army in modern society, the customs and traditions of the Army, marksmanship, leadership assessment feedback, military law, administration and professional ethics. Military Science training prepares qualified students seeking a baccalaureate degree to serve as commissioned officers in the active Army, the Army National Guard or the Army Reserve.

### Programs

The department has three on-campus officer training programs: the four-year program consisting of the basic course for freshmen and sophomores followed by the advanced course for juniors and seniors; a three-year program where the basic course is compressed into the sophomore year followed by the advanced course, and a two-year program with four entry points for students. The first entry point is where placement credit is allowed for the basic course to qualified veterans and serving members of the Army National Guard and the Army Reserve. A second entry point into the two-year program is available to qualified students without any prior military training by taking 90 contact hours of the basic course based on a special arrangement with the department. The third entry point is available to students who desire to be paid for the equivalent of the basic course by attending the ROTC Basic Camp in the summer prior to their junior year. Finally, qualified students can be admitted to the advanced Course by signing a contract to complete the ROTC Basic Camp and the Advanced Course requirements during their last two years in college. BY ENROLLING IN THE BASIC COURSE OR ITS EQUIVALENT SUBSTITUTE TRAINING, STUDENTS DO NOT MAKE ANY COMMITMENT TO THE US ARMY UNLESS THEY ARE SCHOLARSHIP RECIPIENTS. TUITION IS NOT CHARGED FOR ROTC COURSES. All necessary ROTC text books, uniforms and other essential materials are furnished to the student at no cost.

### Courses

#### 101-102 Military Science I

##### 101 Introduction to Military Science. 1 FSSu

Includes the following meaningful for life subjects: The role of the Reserve Officers Training Corps (ROTC), organization of the Army, Army Reserve and National Guard, Leadership and small group process, and marksmanship. OPTIONAL LABORATORIES include smallbore rifle marksmanship, adventure training such as rappelling, and life saving techniques.\*

##### 102 Introduction to Orienteering. 1 FSSu

Fundamentals of military geography and the use of maps and contemporary leadership awareness. OPTIONAL LABORATORIES include land navigation using map and compass, military ceremonies and an outdoor leadership and tactics exercise.\*

#### 201-202 Military Science II

##### 201 Management Simulation Program. 2\*\* FS

This course is designed to provide students with opportunities to apply basic management skills within the context of realistic situations. Each simulation exercise encountered is based on real life problems that require knowledge and skills applicable to management environments. Each module is comprised of practical work exercises designed to elicit behavior that demonstrates ability to apply managerial skills. LABORATORIES include principles of military ceremonies, lifesaving techniques, and an outdoor adventure practicum.\*

##### 202 Leadership Assessment Program. 2\*\* FS

This program evaluates student attributes in twelve leadership dimensions through exercises designed to bring out specific behavior. The course consists of four exercises followed by individual performance feedback and group seminars on each of the leadership dimensions. LABORATORIES include military ceremonies, physical development practicum, and an outdoor adventure practicum.\*

##### 290 (Mil 101, 102, 201, and 202) Compressed Leadership Challenge, 1-4(0) FSSu

This accelerated military science course offers the same training as in the basic Army ROTC level for freshmen and sophomores. However, the student takes the course on weekends, during breaks in the school year or a similar arrangement or combination of time periods. This course rapidly qualifies selected freshmen, sophomores, and juniors for entry into the Advanced Course of Army ROTC. The student can compress one, two, three, or all four of the military science courses depending on which particular course is needed to fulfill the requirement.

##### 295 ROTC Six Week Basic Camp, 4 Su.

Substitutes for freshman and sophomore on-campus instruction by giving practical experience in a field training environment. Challenges the student physically and mentally. The camp provides a practical introduction to small unit operations. Course grade derived from student's overall camp evaluation results and a paper on the training and leadership experience. Student should be a second semester sophomore or junior with more than 2 years remaining before graduation.

#### 301-302 Military Science III

##### 301 Leadership Practicum 2(2\*\*) FS

Development of skills necessary to be an effective leader to include an understanding of: communication skills, human relations, organizational structures, power and influence and management skills. It is a practical exercise program designed to develop those skill areas which are important in leadership. A 2.0 academic grade point average is required for enrollment. Laboratory work includes physical fitness, land navigation, leadership in drill and ceremonies, and leadership reaction practical exercises.\*

##### 302 Modern Tactics and Leadership. 3(3\*\*) FS

Application of skills learned in MS 301 with emphasis on leadership and management of personnel and resources in an outdoor environment. Subjects include: radio and telecommunications, weapons systems, and military skills orientation. A 2.0 academic grade point average is required for enrollment. Laboratory work includes enhanced physical fitness training and evaluation, leadership evaluation and an overnight tactical exercise.\*

#### 401-402 Military Science IV

##### 401 Soviet Military Thought and US Army Administration. 2(2\*\*) FS

The first half of the semester will deal with the contemporary Soviet military organization, strategy and tactics, and weapons systems. The second half of the semester will provide the student with the fundamentals of US Army administration procedures. Laboratory work includes practical work as a cadet officer trainee within the structure of the cadet corps as well as special projects stressing the leadership dimensions of planning and organizing, administrative control, delegation, influence and decision making. Labs are a continuation of MS 301 and 302.

##### 402 Military Law and Professional Ethics. 3(3\*\*) FS

Outlines the historical basis for the development of the current military law system. The student will learn the intent and methods of application of military justice. This course also provides the student with an introduction to the profession of officership, the characteristics of this calling and the uniqueness, roles, and responsibilities of an officer. Laboratory work is a continuation of MS 401 with emphasis on conducting a tactical training exercise for the MS III students.

##### 494 Military Science Advanced Camp and Internship 4 Su

ROTC six week Advanced Camp supplements on-campus instruction by giving practical experience in a field training environment. Provides opportunities to develop and demonstrate leadership capabilities in various situations, with emphasis at the small group level, through problem analysis, decision making, and troop leading experiences. Challenges you physically and mentally and provides a practical introduction to Army life. Course grade derived from student's overall camp evaluation results and a paper on the training, or training management analysis of internship experience.

##### 495 ROTC Nursing Advanced Camp 3 Su

Clinical experience in a military hospital. Includes a one-week field training exercise followed by a five-week clinical practicum with self study and research. Provides Advanced Course ROTC nursing students leadership experiences in the clinical nursing setting and knowledge of the duties, responsibilities, and expectations of the Army Nurse. With approval of College of Nursing, experience may be substituted for three of required six credits of Nursing 491, Directed Studies in Nursing (See Nursing 491. P, Mil 302 and approval of College of Nursing (for credit.)

## Leadership Development Lab

### Military Science I and II Laboratories

A series of labs on military-related subjects such as orienteering, recondo, mountaineering, and various physical activities. These outdoor enrichment labs are optional for freshman. Schedule to be arranged.

### Military Science III Lab

Duties and responsibilities of junior leaders, emphasis on developing confidence, proficiency, and physical fitness.

### Military Science IV Lab

Application of leadership principles, stressing responsibilities of the leader and affording experience and developing potential through the planning, conduct, and execution of training managerial experiences.

\*Elective course work required within other disciplines such as natural sciences, social science, humanities, and foreign language for scholarship recipients.

\*\*Minimum of 15 hours of laboratories required.

**Requirements for Advanced Course** All those enrolling in the Advanced Course must:

- (1) Have completed the Basic Course or its equivalent.
- (2) Be a U. S. citizen and able to complete the Advanced Course, graduate, and be commissioned prior to age 30.
- (3) Be physically qualified under standards prescribed by the Department of the Army.
- (4) Successfully complete such survey and general screening tests as may be prescribed.
- (5) Sign a written agreement.
- (6) Have an academic grade point average of 2.0 or higher.
- (7) Complete a University offered Military History course prior to graduation.
- (8) Have two years of academic work remaining for a degree.

NOTE: Freshmen with prior military experience must have 30 semester hours of credit acceptable by the University prior to enrollment in the Advanced Course.

Upon completion of the Advanced Course, students are eligible for commission as second lieutenants in the Army.

### Army ROTC Scholarships

#### Financial Assistance

•Scholarships. Qualified students can compete for 4-year, 3-year, and 2-year scholarships which cover full tuition, laboratory and instructional fees, University student fees (less tickets for athletic events), transcript, cap and gown, diploma, and selected graduation fees. A flat rate book and supplies payment and a \$100.00 a month subsistence allowance are provided each semester. Scholarship competition (4-year scholarship) is conducted in the fall for University bound high school students and in the fall semester for on-campus freshmen and sophomores (3- and 2-year scholarships). Applications are available in Room 200, ROTC Armory. NOTE: High school students should contact their high school counselor for 4-year scholarship application forms, to be completed following the junior year or early in the fall of the senior year. If your counselor does not have the forms, contact the Dept of Mil Sci, SDSU, Brookings, SD 57007 or call (605) 688-6151.

•Army ROTC courses are tuition free.

•Military uniforms (for wear during military science classes), text books and equipment are free.

•Students enrolled in the junior and senior level military science courses receive the same \$100 per month (not to exceed ten months in a school year) tax free subsistence allowance which the scholarship students receive.

#### Optional Army Schooling Available to Qualified Cadets

- (1) Airborne training at Fort Benning, Georgia for 3 weeks
- (2) Air Assault training at Schofield Barracks, Hawaii for 10 days
- (3) Cadet Troop Leader Training at selected Army posts with an active Army or reserve component unit for 2 to 3 weeks
- (4) Flight Orientation Training Program at Fort Rucker, Alabama for 3 weeks

(5) Northern Warfare training at Fort Greely, Alaska for 3 weeks

(6) Nursing Advanced Camp at selected Army hospitals for 4 weeks

(7) Ranger training at Fort Benning, Georgia for 6 weeks

### Minor in Military Science

A minor in Military Science is available for those who complete 12 credits offered and who enroll and complete MS 494 Internship. This minor is compatible to fields of major studies.

## Music (Mus)

### College of Arts and Science

Professor Hatfield, head; Professors Johnson, Piersel, P. Royer, Walker; Associate Professors H. Berberian, Colson, McKinney; Assistant Professors D. Saladino, Spencer, Vensand; Instructors A. Berberian, R. Royer, J. Saladino

It is the responsibility of the music department to culturally serve and enrich the university community. Students are served through several options offered: participation in various academic courses, participation in making music (performance) in a variety of music organizations and/or through Applied Music (private instruction in performance), and by attending the various cultural programs presented by the department throughout the year.

#### General Information

Several courses are offered to non-majors to stimulate the appreciation and understanding of music as a dynamic cultural force in our civilization, and/or to provide opportunities for further development of **Musical Aesthetics** for lifetime enjoyment and for future avocational pursuits. Credits earned in some of these courses may be applied toward Humanities requirements of the University Core.

- A. Courses which do not require previous musical knowledge or instructor consent: Music Appreciation—Mus 100; Blues, Jazz and Rock—Mus 300; Class voice—MuAp 101-103; Class Piano—MuAp 111-113.
- B. Courses which require some musical background and consent of instructor: All 100 and 200 Applied Music Courses (Private or Class Instruction in Voice, Keyboards, Strings, Woodwinds, Brass or Percussion). Music Literature courses (I, II, III, IV); Basic Musicianship I & II (Music Theory)
- C. **Performance Groups (audition with director required):** Concert Choir, Marching Band, Statesmen, Concert Band, Pasquettes, Symphonic Band, Chamber Singers, Jazz Ensembles, Symphony Orchestra, Woodwind Ensembles, String Ensembles, Brass Ensembles, Opera Theatre, Percussion Ensemble, Broadway Musical Production, and Opera Workshop.

#### The Music Major or Minor

Degrees offered for a major are the Bachelor of Arts in Music (B.A. Music) the Bachelor of Science in Music Merchandising (B.S.) and the Bachelor of Music Education (B.M.E.). The latter leads to teaching certification.

#### Bachelor of Arts — Music Major Program

General Studies & Electives

(B.A. & University Core plus electives).....	70 hrs.
Music Curriculum:	
Basic Musicianship (Theory & Literature).....	32 hrs.
Performance (Applied Music & Ensembles).....	20 hrs.
Senior Recital or Honors Recital.....	0-2 hrs.
Music Electives.....	4-6 hrs.

Total 128 hrs.

This program is recommended for those whose intellectual temperament is more suited to a Liberal Arts program rather than the professional Bachelor of Music Education program. It provides an appropriate background for some candidates for advanced degrees

preparing for such careers as musicologists, composers, music librarians, or teachers. Classical or jazz performance, composition, analysis or history and literature may be elected. (Students may pursue the B.A. and combine teaching certification by adding the appropriate Music Education courses and Professional Education courses found in the B.M.E. program.) This program is also recommended for those who want a double-major or who want a complimentary area such as Art, Dance, Drama, Foreign Language, Business, Electronics, and Radio-Television. Careful planning with advisers from music and these other disciplines is extremely important in considering schedules.

**Bachelor of Science (Music Merchandising Option)**

General Studies (B.S. + University Core + electives)	48 hrs.
Music Curriculum:	
Basic Musicianship (Theory & Literature)	32 hrs.
Performance (Applied Music & Ensembles)	13 hrs.
Music Industry	3 hrs.
Senior Recital	0 hrs.
Professional Requirements	18 hrs.
General electives	14 hrs.

Total 128 hrs.

The Bachelor of Science Degree is designed for those students with a strong background in music but have elected to not pursue a career in music performance or music education. The available option within the B.S. degree allows a student to continue to develop their musical skills along with in-depth study in economics, communications and computer science leading to possible career opportunities in the music industry or related fields.

**Bachelor of Music Education Program**

General Studies (B.M.E. & University Core)	42 hrs.
Music and Professional Education	86 hrs.

Total 128 hrs.

This program is recommended for those who wish to gain teacher certification. An emphasis in choral or instrumental teaching may be elected, or, by adding appropriate hours, students may prepare in both areas.

**Specific Courses Required for Choral Emphasis**

Conducting Fundamentals, Mus 260; Pedagogy I-II, Mus 270-271; Pedagogy III-IV, Mus 370-371; Music Education I, Mus 351 Elementary & General; Music Education II, Mus 361, Sect 1, Choral Conducting; Music Education III, Mus 362, Vocal Emphasis; Music Education IV, Mus 365, Supervision and Adm.

**Specific Courses Required for Instrumental Emphasis**

Conducting Fundamentals, Mus 260, Pedagogy I-II, Mus 270-271; Pedagogy III-IV, Mus 370-371; Music Education I, Mus 351 Elementary & General; Music Education II, Mus 361, Sect 2, Instrumental Conducting; Music Education III, Mus 362, Instrumental Emphasis; Music Education IV, Mus 365, Supervision & Adm.

**Music Requirements: (All music majors)**

1. Music Majors in all degree programs must choose an area of Applied Music for specialization and must meet the proficiency standards of the department.
  - a. A jury examination at the end of each semester is required.
  - b. Students must apply for and be granted approval to advance to the 300-400 levels of Applied instruction.
  - c. A minimum of 6 hours of 300-400 level Applied Music is required.
2. Auditions: Admission as a major requires successful completion of an audition in the applied major area.
3. Piano proficiency is required of all majors.
4. Voice or Instrumental Proficiency is required of all Keyboard majors.
5. Foreign Language study is strongly recommended for students whose applied concentration is voice in the B.M.E. program. 14

Hours of Foreign Language is required of all students enrolled in the B.A. program.

**6. Ensemble Requirements:**

- a. In addition to the applied music, all music majors must participate in at least one major ensemble each semester they are enrolled as a regular university student (minimum of seven semesters)
  - wind and percussion students must elect Band, including two semesters (minimum) of Marching Band.
  - string students must elect orchestra
  - voice students must elect an appropriate choral group
  - keyboard majors may elect any of the above organizations to satisfy this requirement.

- b. Participation in small ensembles is strongly encouraged for all majors and minors. (Keyboard majors may elect Accompanying.)

7. A minimum of four pedagogy courses is required for those in the B.M.E. program. Instrumental students may wish to take six pedagogy courses to gain stronger preparation for teaching. The following courses are suggested:

**Brass Major**

- 2 W. W. Ped.
- 1 Brass Ped.
- 1 Percussion Ped.
- (1 string)
- (1 extra Brass)

**Woodwind Major**

- 1 W. W. Ped.
- 2 Brass Ped.
- 1 Percussion Ped.
- (1 string)
- (1 extra W. W.)

**Percussion Major**

- 2 W. W. Ped.
- 2 Brass Ped.
- (1 Percussion Ped.)
- (1 string)

8. Recommendations for enrolling in student teaching will be issued by the department head following an interview with the student and his adviser.

9. Senior recitals are required of all music majors.

10. Attendance at a weekly recital/forum is mandatory each semester a major or minor is enrolled for Applied music lessons. Students must enroll in Mus 195 for 0 hours credit to fulfill this requirement. Additionally, students are required to attend certain other evening concerts and recitals each semester as determined by the department.

**Music Minor**

Music Theory I & II	8 hrs.
Music Literature I	2 hrs.
Conducting Fundamentals	2 hrs.
Music Education II (Vocal or Instrumental Conducting)	2 hrs.
Applied (at least two hours upper level)	6 hrs.
Music Electives	2 hrs.

Total 22 hrs.

(In addition, minors must participate in Major Ensembles each semester in which they are enrolled in Applied Music lessons. Participation in small ensembles is strongly encouraged.)

**Suggested Curriculum in Arts and Science, Music Major — B.A. Leading to the Bachelor of Arts degree (128 Semester Hours)**

	Credit	
Freshman Year	F	S
Fr Comp, Engl 101	3 or	3
Fund of Speech, SpCm 101	3 or	3
Foreign Language	4	4
Fitness & Lifetime Activities, PE 100	1	1
Basic Musicianship I-II, Mus 110-111	4	4

Music Literature I-II, Mus 130-131.....	2	2
Applied Music .....	1	1
Music Organization.....	1-2	1-2
16-17		
<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Natural Science*.....	4	4
Foreign Language.....	3	3
Math.....	3	or 3
Conducting Fund, Mus 260.....	2	
Intermediate Musicianship III-IV, Mus 210-211.....	3	3
Music Literature III-IV, Mus 230-231.....	2	2
Applied Music.....	1	1
Music Organizations.....	1-2	1-2

17		
<b>Junior Year</b>	<b>F</b>	<b>S</b>
Junior Composition, Engl 300.....	3	or 3
Humanities* (Electives).....	3	
Social Science*.....	3	3
General Electives.....	2	or 2
Music Literature V, Mus 433.....	2	
Counterpoint, Mus 311.....	3	
Forms and Analysis, Mus 313.....		3
Applied Music (300-400).....	2	2
Music Organizations.....	1-2	1-2

16-17		
<b>Senior Year</b>	<b>F</b>	<b>S</b>
Humanities* (Electives).....	3	3
Social Science*.....	3	3
General Electives.....	4	4
Music Electives.....	2	2
Orchestration & Arranging, Mus 420.....	2	or 2
Recital, Mus 493.....	0-2	0-2
Applied Music 400.....	2	2
Music Organizations (if requirement not met).....	1-2	1-2

16-18		
<b>Suggested Curriculum in Arts and Science, Music Education Major B.M.E. Leading to the Bachelor of Music Education Degree (128 Semester Hours)</b>		
<b>Credit</b>		
<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Fr Comp, Engl 101.....	3	or 3
Fund of Speech, SpCm 101.....	3	or 3
Foreign Language or Humanities* Elective.....	3-4	3-4
Fitness & Lifetime Activities, PE 100.....	1	1
Basic Musicianship I-II, Mus 110-111.....	4	4
Music Literature I-II, Mus 130-131.....	2	2
Applied Music.....	1	1
Music Organizations.....	1-2	1-2

15-17		
<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Natural Science*.....	4	4
Practicum, SeEd 287.....	2	or 2
Psychology, Psyc 101.....	3	or 3
Conducting Fundamentals, Mus 260.....	2	
Music Education I - II.....	2	2
Pedagogy I & II, Mus 270-271.....	1-2	1-2
Intermediate Musicianship III-IV.....	3	3
Music Literature III-IV Mus 230-231.....	2	2
Applied Music.....	1	1
Music Organizations.....	1-2	1-2

16-17		
17-19		

<b>Junior Year</b>	<b>F</b>	<b>S</b>
Junior Composition, Engl 300.....	3	or 3
Math.....	3	or 3
Education, E Psyc 302 & EdFn 339.....	2	2
Music Education III-IV.....	2	2
Pedagogy III-IV.....	1-2	1-2
Counterpoint Mus 311.....	3	
Forms & Analysis, Mus 313.....		3
Music Literature V.....	2	
Applied Music (300 level).....	2	2
Music Organizations.....	1-2	1-2

16-17		
16-17		
<b>Senior Year</b>	<b>F</b>	<b>S</b>
Social Science* Anth 421 or Hist 368.....	3	or 3
Social Science*, elective.....	3	or 3
Education, SeEd 450 (Reading).....	3	or 3
Orchestration & Arranging, Mus 420.....	2-3	or 2-3
Applied Music (400 level).....	2	or 2
Senior Recital, Mus 493.....	0-2	or 0-2
Elective.....	2	or 2

15-17		
15-17		

Student Teaching & Education.....	17	or 17
-----------------------------------	----	-------

\*Must be taken in at least two areas.

**Suggested curriculum in Arts and Science,  
Music Merchandising Major  
Leading to Bachelor of Science Degree (128 semester hours)**

			<b>Credit</b>
<b>Freshman Year</b>	<b>F</b>	<b>S</b>	
Freshman Comp, Engl 101.....	3	or 3	
Fund of Sp, SpCm 101.....	3	or 3	
Fitness & Lifetime Activities, PE 100.....	1		1
Humanities* or Music Industry.....	3		
Math.....			3
Basic Musicianship I-II, Mus 110, 111.....	4		4
Music Literature I-II, Mus 130, 131.....	2		2
Applied Music.....	1		1
Music Organizations.....	1		1

			15	15
<b>Sophomore Year</b>	<b>F</b>	<b>S</b>		
Social Science*.....	3		3	
Bio Science.....	3		3	
Microeconomics Principals, Econ 202.....				3
Humanities* or Music Industry.....	3			
Intermediate Musicianship III-IV, Mus 210, 211.....			3	3
Music Literature III-IV, Mus 230, 231.....	2		2	
Applied Music.....	1		1	
Music Organizations.....	1		1	

			16	16
<b>Junior Year</b>	<b>F</b>	<b>S</b>		
Junior Comp, Eng 300.....				3
Social Science*.....	3	or 3		
Humanities*.....	2	or 2		
Physical Science.....	4	or 4		
Accounting.....	3			
Publicity Methods, M Com 313.....				2
Counterpoint, Mus 311.....	3			
Forms & Analysis, Mus 313.....				3
Applied Music.....	2			2

Music Organization.....	1	1
General Electives.....	2	
	16-17	15-17
<b>Senior Year</b>	<b>F</b>	<b>S</b>
Business Finance, B-Ad 310.....	3	
Physical Science.....		4
Computer Program & Data Process, Math 271.....		4
Marketing, Econ 353.....	3	
Orchestration & Arranging, Mus 420.....	2	
Music Literature V, Mus 433.....		2
General Electives.....	8	8
	17	17

\*Must be taken in at least two areas.

## Music (Mus)

The Music courses are divided into the following areas: Music (Mus); Applied Music (MuAp); and Ensemble (MuEn).

### Undergraduate Courses

#### General

##### 100 Music Appreciation (Topical) 2(2,0) FS

Musical periods and styles for the non-major. Emphasis on music fundamentals for the listener, and music appreciation. Music in the humanities. A humanities elective.

##### 195 Recital Attendance 0

Required of all music majors each semester (except B.M.E. during semester of student teaching). No prerequisite.

##### 200 Music Appreciation Music Theatre 2(2,0)

For the non-major. Development of the Broadway Musical, Opera and Operetta in America. Offered on sufficient demand.

##### 300 Blues, Jazz & Rock 2(2) FS

Origins and developments of three uniquely American musics and their cultural impact upon, and within, American society. (A humanities elective)

##### 202 The Music Industry 3(3,0) F (Alternate years)

This course examines the many facets of the music industry: music publishing, copyright distribution and merchandising music and the mass media, the recording industry, manufacturing and music management. Music in the marketplace. P. Consent

#### Theory

##### 110 Basic Theory & Musicianship I 4(3,2) F

Emphasis on fundamentals and basic skills. Terminology, fundamentals of musicianship, ear training, sight singing, keyboard skills, chord structures, score analysis. Introduction to four-part writing. (Majors and Minors must enroll for Mus 110 and Mus 130 concurrently.)

##### 111 Basic Theory & Musicianship II 4(3,2) S

Continuation of Mus 110. Continued development of fundamental skills. Rhythmic and melodic dictation, sight singing, keyboard skills, score analysis, four-part writing. (Majors should enroll for Mus 111 and Mus 131 concurrently.) P, Mus 110.

##### 210 Intermediate Theory & Musicianship III 3(3,2) F

Continuation of Mus 111. Harmonic and Melodic techniques of music literature - analysis, composition, dictation, sightsinging and ear-training. Introduction to principles of orchestration and arranging. P, Mus 111.

##### 211 Intermediate Theory & Musicianship IV 3(3,2) S

Continuation of Mus 210. Integrated study of melodic and harmonic techniques in Romantic and Contemporary literature - analysis, composition, performance, and score study. Continuation of sightsinging, ear-training, dictation and orchestrations fundamentals. P, Mus 210.

##### 311 Counterpoint (Advanced Musicianship V) 2-3(3,0) F

Analysis and composition in contrapuntal techniques concentrated study of selected scores ranging through contemporary literature. P, Mus 211.

##### 313 Form & Analysis (Advanced Musicianship VI) 2-3(3) S

Analysis of small and large forms. Concentrated study of selected scores ranging through contemporary music. P, Mus 211.

##### 420 Orchestration & Arranging (Advanced Musicianship VII) 3(3,0) FS

Projects in scoring for various groups, advanced study and analysis of scores. P, Mus 311 313 or consent.

##### 424 Composition 2-5(3,2)

Emphasis on contemporary techniques and non-western composition techniques. Advanced study of tonality systems. Electronics and music. Composition projects. P, Mus 311 and 313 or consent. On sufficient demand.

#### Music Literature

##### 130 Music Literature & History I 2(2) F

Musical periods and styles to the study of music literature and history — emphasis on developing fundamental knowledge of music literature, understanding and aesthetics. Designed for those with some music background. May be taken as a humanities elective.

##### 131 Music Literature & History II 2(2) S

Ancient through Medieval and Renaissance music literature — analysis of style and form, study of historical development and significance, comparison to similar works in other periods of music history. Emphasis on listening and score study. May be taken as humanities elective.

##### 230 Music Literature & History III 2(2) F

Baroque and Classical Music literature—analysis of style and form, study of historical development and significance, comparison to similar works in other periods of music history. Emphasis on listening and score study. May be taken as humanities elective.

##### 231 Music Literature & History IV 2(2) S

Romantic Music Literature — analysis of style and form, study of historical development and significance, comparison to similar works in other periods of music history. Emphasis on listening and score study. May be taken as humanities elective.

##### 433 Music Literature V: 20th Century Music 2(2) F

This course examines musical developments of the twentieth century in terms of three great cycles: first, the demise of functional tonality (1870-1918), second, the era of exploration, experimentation, and consolidation between the world wars (1918-1945), the third, the post-Hiroshima epoch (1945-present), with its attendant rationalist-anti-rationalist dichotomy.

##### 435 Music Bibliography 3(3,0)

Source material for music research. Not offered every year. P, Instructor consent.

#### Music Education

##### 260 Conducting Fundamentals 2(2,1) F

Basic principles in conducting - rehearsal and performance. Score reading and preparation. P, Mus 110 and 111. (Concurrent with Mus 210 or 211.)

##### 351 Music Education I: Elementary Music Concepts 2(2,1) F

Concepts, methods and materials for teaching fundamentals in public schools from K-12. Emphasis on Elementary, General Music, and vocal music techniques.

##### 361 Music Education II: Conducting 2(2,1) S

Section 1: Instrumental music methods and materials. Emphasis on rehearsal techniques, conducting and study of appropriate materials. Section 2: Choral music methods and materials. Emphasis on rehearsal and conducting techniques through study of appropriate materials.

##### 362 Music Education III: Methods and Materials 2(2,1) F

Section 1: Instrumental music methods and materials. Emphasis on lesson, solo and ensemble materials for the public school music teacher, teaching techniques for individual and class instruction Section 2: Vocal Music Methods and Materials. Emphasis on lesson, solo and ensemble materials for the public school music teacher, including teaching techniques for individual and class instruction.

##### 365 Music Education IV: Supervision & Administration of School Music 2(2,1) F or S

Historical survey of public school music. Objectives and goals of the music program. Organization and administration of school music, contemporary concepts.

##### 465 Music Education V Instrumental Techniques 2(2,0) F or S (Alternate Years)

Three major technical topics for the prospective music teacher will be covered: Marching Band techniques, Jazz Ensemble techniques and Instrumental Repair. Emphasis on in depth development of skills and practical application. (Offered even years or on demand.)

##### 488 Supervised Teaching in Secondary Schools 4(TBA) FS

Students may register for 4 hours under SeEd 488 and 4 hours under Mus 488. (Second half of semester)

#### Pedagogy

##### 270 Pedagogy I 1-2(2,0) F

Pedagogical considerations in teaching music. Methods and concepts in specialized areas: Section 1 Voice; Section 2 Strings; Section 3 - Keyboard; Section 4 - Clarinet & Flute; Section 5 -Double Reeds & Saxophone; Section 6 - High Brass; Section 7 - Low Brass; Section 8 - Percussion Voice & Keyboard offered even years only

**271 Pedagogy II 1-2(2,0) S**

Continuation of Music 270 sections 1-8 as in 270. Voice & Keyboard offered odd years only.

**370 Pedagogy III 1-2(2,0) F**

Continuation of Mus 271, sections 1-8 as in 270. Voice and Keyboard offered odd years only.

**371 Pedagogy IV 1-2(2,0) S**

Continuation of Mus 370, sections 1-8 as in 270. Voice and Keyboard offered even years only.

**Individual Offerings**

**102 Living and Study Abroad** See description in Arts and Science section.

**295 Course Specials Program 5**

See description in Arts and Science section.

**390-490 Independent Studies 1-3**

Consent. May be used as substitute for music requirement.

**391-491 Directed Studies 1-3**

Special projects in music for which there is no course. Projects must be approved by Music Department staff. Consent.

**395 Course Specials Program 5**

See description in Arts and Science.

**493 Public Recital 0-1-2 FS**

All music majors are required to present a Senior Recital. Students may elect to enroll for Public Recital as follows: 0 credits, 1 credit, or with permission from the Department Head and Applied Instructor, for 2 credits. The latter option requires a research paper on the literature performed, a recital preview with an oral defense of the research paper and the public performance. Students enrolled in Mus 493 must be concurrently enrolled in 400 level Applied lessons.

**494-495-496 Cooperative Education/Internship/Field Experience (Topical) 3-12**

See description in Arts and Science section.

**Graduate Courses****590-690 Independent Studies 1-3**

Consent. May be used as substitute for music requirement.

**591-691 Directed Studies 1-3**

Special projects in music which must be approved. Consent.

**596-696 Course Specials 1-5**

See description in Arts and Science section.

**Applied Music (MuAp)**

(Private or Class Instruction in Literature & Techniques) Selected lessons at the 100 level may be taken for Fine Arts credit as part of the Liberal Studies Core (see p.15). These courses may be repeated for credit twice.

**Undergraduate Courses****Individual Instruction in Voice**

100-102	1(1/2,0)FS	200-202	1(1/2,0) FS
300-302	2(1,0) FS	400-402	2(1,0) FS

**Class Instruction in Voice**

101-103	1(1,0) FS	201-203	1(1,0) FS
301-303	2(2,0) FS	401-403	2(2,0) FS

**Individual Instruction in Keyboard**

110-112	1(1/2,0) FS	210-212	1(1/2,0) FS
310-312	2(1,0) FS	410-412	2(1,0) FS

Section 1 — Piano

Section 2 — Harpsichord

Section 3 — Organ

**Class Instruction in Keyboard**

111-113	1(1,0) FS	211-213	1(1,0) FS
311-313	2(2,0) FS	411-413	2(2,0) FS

**Individual Instruction in Woodwinds**

120-122	1(1/2,0) FS	220-222	1(1/2,0) FS
320-322	2(1,0) FS	420-422	2(1,0) FS

Section 1 — Flute

Section 2 — Oboe

Section 3 — Bassoon

Section 4 — Clarinet

Section 5 — Saxophone

**Class Instruction in Woodwinds**

121-123	1(1,0) FS	221-223	1(1,0) FS
320-423	2(2,0) FS	421-423	2(2,0) FS

Section 1 — Flute

Section 2 — Oboe

Section 3 — Bassoon

Section 4 — Clarinet

Section 5 — Saxophone

**Individual Instruction in Brass**

130-132	1(1/2,0) FS	230-232	1(1/2,0) FS
330-332	2(1,0) FS	430-432	2(1,0) FS

Section 1 — Trumpet

Section 2 — French Horn

Section 3 — Trombone

Section 4 — Baritone

Section 5 — Tuba

**Class Instruction in Brass**

131-133	1(1,0) FS	231-233	1(1,0) FS
331-333	2(2,0) FS	431-433	2(2,0) FS

Section 1 — Trumpet

Section 2 — French Horn

Section 3 — Trombone

Section 4 — Baritone

Section 5 — Tuba

**Individual Instruction in Percussion**

140-142	1(1/2,0) FS	240-242	1(1/2,0) FS
340-342	2(1,0) FS	440-442	2(1,0) FS

**Class Instruction in Percussion**

141-143	1(1,0) FS	241-243	1(1,0) FS
341-343	2(2,0) FS	441-443	2(2,0) FS

**Individual Instruction in Strings**

150-152	1(1/2,0) FS	250-252	1(1/2,0) FS
350-352	2(1,0) FS	450-452	2(1,0) FS

Section 1 — Violin

Section 2 — Viola

Section 3 — Cello

Section 4 — Bass Viol

Section 5 — Guitar

**Class Instruction in Strings**

151-153	1(1,0) FS	251-253	1(1,0) FS
351-353	2(2,0) FS	451-453	2(2,0) FS

Section 1 — Violin

Section 2 — Viola

Section 3 — Cello

Section 4 — Bass Violin

Section 5 — Guitar

**Accompanying (Pianists only)**

181-183	1(2,0) FS	281-283	1(2,0) FS
381-383	2(2,0) FS	481-483	2(2,0) FS

All applied lessons must have instructor's consent. Class instruction consists of Master Classes at two levels 1) Beginners; 2) Advanced.

**Ensembles (MuEn)**

(Performance of Significant Literature)

**Undergraduate Courses**

Music Organizations are open to all University Students. Auditions are required. Freshmen and Sophomores must register for 100 level of large ensembles. Juniors and Seniors register for 300 level. Small ensembles; Freshmen 100 level, Sophomores 200 level, Juniors 300 level, Seniors 400 level. Students may register for selected ensembles at the 100 level for Fine Arts credit as part of the Liberal Studies Core (see p. ). Each course may be repeated for credit.

**University Chorus/Pasquettes**

100-300 1(0,2) FS

**Concert Choir**

101-301 1-2(0,5) FS

**Statesmen**

102-302 1(0,2) FS

**Civic-University Orchestra**

110-310 1(0,2) FS

**Marching Band**

120-320 1-2(0,5) F

**Symphonic Band**

121-321 1(0,3) FS

**Concert Band**

122-322 1(0,2) FS

**Pep Band**

123-323 1(0,2) S



Chamber Choir 130-230	1(0,2) FS	330-430	1(0,2) FS
String Ensembles 140-240	1(0,2) FS	340-440	1(0,2) FS
Woodwind Ensembles 150-250	1(0,2) FS	350-450	1(0,2) FS
Brass Ensembles 160-260	1(0,2) FS	360-460	1(0,2) FS
Percussion Ensemble 170-270	1(0,2) FS	370-470	1(0,2) FS
Jazz Ensemble 180-280	1(0,2) FS	380-480	1(0,2) FS

## Nursing (Nurs) College of Nursing

Associate Professor Hardin-Palmer, head; Professors Emeriti Erickson, Holter, Johnson; Professors Hofland, C. Peterson, E. Peterson; Associate Professors Anderson, Gilliland, Goddard, Hanson, Hegge, Holmes, Howe, Keller, Moriarty, Ritter, Schroder; Assistant Professors Ayotte, Brotsky, Chappell, Coyne, DeGroot, Doherty, Gaspar, Gehrke, Hanna, Iken, Jensen, Joffer, Kropenske, Larson, McBreen, Meyer, Pettigrew, Preheim, Sanders, Schroeder, Scott, Shroyer, Wagner; Instructors Adams, Carson, Erpenbach, Foland, Henderson, Hennies, Lutter, Peters, Schurrer, Sorenson, Tschetter.

The program purposes: (a) To provide a liberal educational environment where persons, regardless of ancestry, sex, or creed, may prepare themselves for beginning professional practice as nurse generalists, so they may provide health care in a variety of settings, using a deliberative nursing process characterized by a holistic client-centered approach in cooperation with other professionals. (b) To provide an educational base for further academic study and for participation in the improvement of the profession and existing health care delivery system.

The professional program leading to a Bachelor of Science degree with a major in Nursing is four academic years, but may be lengthened for those who need a longer time or want an enriched program.

The program consists of communication skills; the humanities, natural and social sciences supportive to nursing; the student's choice of electives, and professional nursing. The curriculum places emphasis on both the service provided outside of the hospital setting and to those who are hospitalized for treatment of acute and chronic illnesses.

Candidates for graduation in the basic curriculum are eligible to write the National Council Licensure Examination-RN (NCLEX-RN) for licensing as registered nurses. Licensing as a registered nurse (RN) is required by law in every state in order to practice professional nursing.

Graduates have a broad and basic preparation for professional nursing practice. They are qualified for first level positions in hospitals, health agencies and other institutions where professional nurses are employed. Graduates are prepared to assume professional responsibility for promotion of health, prevention of illness, and for nursing diagnosis, therapy, and rehabilitation. They assume responsibility for the guidance of nursing personnel and work cooperatively with other health care providers. They have the foundation for advanced study in nursing or specialization at the graduate level.

Both the undergraduate and graduate nursing programs at SDSU are approved by the South Dakota Board of Nursing, and are accredited by the North Central Association of Colleges and Secondary Schools, and the National League for Nursing. The College is a member agency in the National League for Nursing Council of Baccalaureate and Higher Degree Programs, American Association of Colleges of Nursing and the Midwest Alliance in Nursing.

### Professional Organizations

Membership is encouraged in the local, state and national nurs-

ing student organizations, a preprofessional organization open to students in the Department of Nursing. The purpose of these organizations is to prepare the student for professional activity.

Phi Chapter, Sigma Theta Tau, an honor society in nursing, was established in 1961. Membership is by election; undergraduate criteria include, but are not limited to, placement in program, demonstrated ability in nursing, and a 3.0 grade point average. Sigma Theta Tau stimulates professional growth and creative activity in nursing.

### Laboratory Facilities

Enrollment in clinical nursing courses will be limited when necessary due to staff and clinical facility limitations.

Majors in nursing have clinical experience in hospitals and health agencies which are chosen by the Department of Nursing.

In these hospitals and health agencies, students are taught principles of professional nursing care under the supervision of SDSU faculty. They learn the concepts of long-term and short-term client care in the fields of maternal-child, medical-surgical, psychiatric, gerontological and community health nursing. Social, cultural and community health concepts are integrated throughout all areas of instruction.

All students have an opportunity to participate in general and specialized client care at rural and urban hospitals, outpatient clinics and public health agencies. Student learning experiences to meet curriculum goals are selected from the following hospitals and health agencies: Brookings Community Hospital; Brookings Clinic; Brookview Manor Nursing Home; Brookings United Retirement Center; White Care Center; Crippled Children's Hospital, Sioux Falls; health departments in Brookings, Moody, Lake, Codington, Hamlin or Deuel Counties; Memorial Medical Center, Watertown; St. Ann's Hospital, Watertown; Sioux Valley Hospital, Sioux Falls; South Dakota Human Services Center, Yankton; Veterans' Administration Center, Sioux Falls; McKennan Hospital, Sioux Falls; and a variety of other community agencies.

### Requirements, Pre-Nursing

Any student eligible for admission to SDSU and who desires to enroll in the College of Nursing and Department of Nursing, is accepted into pre-nursing.

### Nursing Major

Upon admission to the nursing course, Nurs 213 Introduction to Nursing Process, the student is accepted into the nursing major.

Minimum requirements for entrance to the nursing major are:

1. A grade of "C" or above in each of the required pre-nursing courses. Courses may be repeated one time only to raise an unsatisfactory grade.
2. A minimum cumulative grade point average of 2.5 in all work completed to date, and successful completion of the pre-nursing courses.
3. Formal application for acceptance to the major. Deadline for application and acceptance is mid-term of the semester preceding entrance into Nurs 213 Introduction to Nursing Process. Failure to meet the application deadline may automatically disqualify the applicant for enrollment in the nursing course that semester.
4. Students preparing for the field of professional nursing must show a reasonably stable personality and demonstrate ability to meet the demands of the professional nurse.

As a generalist in nursing, a professional nurse is expected by the employer, consumers, and other health care providers to assume specific role responsibilities in a safe and competent manner. Therefore, all skills taught and evaluated in the SDSU nursing program are requisites for successful completion of the program.

For admission to the nursing major courses, the student must meet technical standards for the nursing major and maintain related satisfactory demonstration of these standards for progression through the program. These standards are in the areas of general abilities, observational ability, communication, motor

ability, intellectual-conceptual ability, and behavioral/social attributes.

Applicants to the major courses are evaluated by the Admissions and Scholastic Standards Committee to determine their ability to acquire knowledge, and develop clinical skills required by the curriculum. Information on the skills and abilities that have been identified as necessary to meet nursing curriculum technical standards are available from the Dean's office, or the student should see their adviser.

Fulfillment of the above requirements do not ensure admission.

Applicants are selected competitively. Total enrollment in the major may vary, depending upon available clinical facilities, qualified faculty and funds, with the selection made from among those best qualified for the study and practice of nursing. Two positions in the nursing major will be reserved each semester for students who are considered 'non-traditional'. Students who have been out of school following high school or college for at least 2 years before beginning prerequisite nursing courses at SDSU, and have completed at least 3 semesters of course work in another major at SDSU or another university or college should see their adviser regarding the application for admission as a non-traditional student.

A cumulative GPA of 2.5 must be maintained for entrance into the second semester of the major courses. If a student drops out of a course in the major for any reason, there is no guarantee that there will be a place for him/her in another semester due to the necessity to limit size of clinical classes.

After acceptance into the major, students failing to obtain a grade of "C" or above in each required course will need the recommendation of the Committee on Admission and Scholastic Standards before being allowed to continue. Nursing courses may be repeated only once to raise an unsatisfactory grade.

The student must have a valid driver's license and insurance for personal liability and property damage when enrolled in courses which require the operation of an automobile other than their own. Professional malpractice and liability insurance will be required when enrolled in courses requiring clinical practice. This insurance is available at a group rate.

For many of the clinical experiences transportation is provided through the SDSU Car Pool, however in the senior year, selected individualized clinical experiences in Nurs 415 Nursing Process: Community as Client, and Nurs 491 Directed Study, require the students to provide their own transportation.

### Professional Conduct

All undergraduate and graduate nursing students are expected to adhere to the principles of the *American Nurses Association Code with Interpretive Statements (1985)*. The *Code for Nurses* communicates a standard of professional behavior expected throughout the total program and in each individual nursing course. Therefore, in addition to dismissal for academic failure, the faculty and administration of the Department of Nursing reserve the right to dismiss any student enrolled in either the undergraduate or graduate program for unethical, dishonest, or illegal conduct that is inconsistent with the Code for Professional Nurses.

### Registered Nurse Students

The registered nurse who is a graduate of a hospital school of nursing or an associate degree program and who wishes to earn a Bachelor of Science Degree in nursing follows the regular application and admission procedure of the university and satisfies the requirements for the degree. Credits for a limited number of courses may be earned by examination. (See Examination for University Credit in Information section.) Upward mobility programs/courses to meet the needs of Registered Nurses have been established in the areas of Aberdeen, Brookings, Mitchell, Sioux Falls, and Rapid City. For answers to specific questions, direct inquiries to the Dean, College of Nursing.

### Transfer Students

Students transferring from other schools are accepted into the Department of Nursing under the general university guidelines.

Those wishing to transfer into upper level nursing courses must furnish additional information as follows:

1. Three references, one of which must be from the director of the program in which you were previously enrolled.
2. A statement regarding your reasons for transferring.

These statements must be on file in the Department of Nursing prior to your acceptance into the upper level nursing major courses. They should be sent to the Dean, College of Nursing.

### Curriculum Design

Required courses are listed in the following plans. Plan A specifies entry into the nursing major spring semester of the sophomore year. Plan B specifies entry into the major fall semester of the junior year. These plans can be altered to meet individual needs. Other plans are available from advisers.

#### Plan A

	F	S
<b>Freshman Year</b>		
General Chemistry, Chem 110.....	4	
Anatomy, Zool 221.....	3	
Fitness & Lifetime Activities, PE 100*.....	1	1
General Psychology, Psyc 101.....	3	
Freshman Comp, Engl 101*.....	3	or 3
Math Core* (Algebra, Math 111 recommend- ed).....	3	
Intro Organic & Biochem, Chem 111.....		5
Intro To Sociology, Soc 100.....		3
Human Dev. & Pers. I, CDFR 211.....		3
Fund of Speech, SpCm 101*.....	3	or 3
Elective/Humanities.....		2
	<hr/>	<hr/>
	17	17
<b>Sophomore Year</b>		
Mammalian Physiology, Zool 325.....	4	
Human Nutrition, NFS 321.....	3	
General Microbiology, Micr 231.....	4	
Human Dev. & Pers. III, CDFR 313.....		2
Abnormal Behavior, Psyc 451.....	3	
Pharmacology, Pha 241.....		3
Pathogenic Microbiology, Micr 423.....		4
Professional Nsg. & Hlth Care I, Nurs 202.....		2
Communication in Nsg, Nurs 203.....		3
Intro to Nsg Process, Nurs 213.....		4
Elective/Humanities.....	2	
	<hr/>	<hr/>
	16	18
<b>Junior Year</b>		
Nursing Process (NP): Adults in Secondary Care, Nurs 314.....	4	
NP: Adults-Secondary Care, Clin, Appn, Nurs 315.....	4	
NP: Ind/Groups Community Mental Health I, Nurs 353.....	2	
NP: Ind/Groups-Community MH I, Clin Appn, Nurs 355.....	2	
Diet Therapy Seminar, NFS 303.....	1	
Junior Comp, Engl 300*.....	3	
Elective.....	2	
NP: Children in Primary & Second Care, Nurs 324.....		3
NP: Children in Primary & Second Care, Clin Appn, Nurs 325.....		4
NP: Childbearing Family in Primary & Sec- ond Care, Nurs 363.....		3
NP: Childbearing Fam. in Prim & Sec Care, Clin Appn, Nurs 365.....		3
Elective/Humanities.....		5
	<hr/>	<hr/>
	18	18

**Senior Year**

Adv. NP: Ind/Groups in Community MH II, Nurs 405.....	2
Adv. NP: Ind in Tertiary Care, Nurs 412.....	3
Adv. NP: Ind in Tertiary Care, Clin Appn, Nurs 413.....	4
NP: Community as Client, Nurs 415.....	3
Leadership in Nursing, Nurs 453.....	2
Public Health Science, HSc 443.....	3
Intro to Research in Nsg., Nurs 473.....	1
Prof Nsg & Hlth Care II, Nurs 463.....	1
Directed Study in Nsg, Nurs 491.....	6
Electives/Humanities*.....	7
	<hr/>
	17

**Plan B**

For the student who desires a slower pace.  
For the student who needs to be gainfully employed.

**First Year**

General Chemistry, Chem 110.....	4
Anatomy, Zool 221.....	3
Fitness & Lifetime Act., PE 100*	1
Math Core* (recommended Algebra, Math 111).....	3
Freshman Composition, Engl 101*	3 or
Intro to Organic & Biochem, Chem 111.....	3
General Psychology, Psyc 101.....	3
Fundamentals of Speech, SpCm 101*.....	3 or
Elective/Humanities*	1
	<hr/>
	15

**Second Year**

General Microbiology, Micr 231.....	4 or
Mammalian Physiology, Zool 325.....	4 or
Intro to Sociology, Soc 100.....	3
Human Dev. & Person. I, CDFR 211.....	3
Electives/Humanities*.....	4
Human Dev. & Person. III, CDFR 313.....	2
Human Nutrition, NFS 321.....	3 or
Abnormal Behavior, Psyc 451.....	3 or
	<hr/>
	16

**Third Year**

Pharmacology, Pha 241.....	3
Prof. Nsg. & Hlth Care I, Nurs 202.....	2
Communication in Nursing, Nurs 203.....	3
Intro to Nsg. Process, Nurs 213.....	4
Junior Composition, Engl 300*.....	3
Humanities*/Electives.....	2
NP: Adults-Secondary Care, Nurs 314.....	4
NP: Adults, Clin. App., Nurs 315.....	4
NP: Ind/Groups-Comm. MH I, Nurs 353.....	2
NP: Ind/Groups-Comm. MH I, Clin. App., Nurs 355.....	2
Diet Therapy, NFS 303.....	1
	<hr/>
	17

**Fourth Year**

NP: Children-Primary & Secondary Care, Nurs 324.....	3
NP: Children, Clin. App., Nurs 325.....	4
NP: Childbearing Family in Primary & Secondary Care, Nurs 363.....	3
NP: Childbearing, Clin App, Nurs 365.....	3

F	S	Public Health Science, HSc 443.....	3
		Adv NP: Ind/Grps in CMH II, Nurs 405.....	2
		Adv NP: Individuals in Tertiary Care, Nurs 412.....	3
		Adv NP: Ind. in Tertiary Care, Clin. App., Nurs 413.....	4
		NP: Community as Client, Nurs 415.....	3
		Leadership in Nursing, Nurs 453.....	2
			<hr/>
			16

**Last (9th) Semester — Graduate in December**

	F
Pathogenic Microbiology, Micr 423.....	4
Intro to Research in Nsg., Nurs 473.....	1
Prof. Nsg & Hlth Care II, Nurs 463.....	1
Directed Study in Nsg., Nurs 491.....	6
Elective/Humanities*.....	3
	<hr/>
	15

**S** Required pre-nursing courses: Chem 110, 111; Psyc 101; Soc 100; Zool 221. MAJOR: Nurs 202, 203, 213, 314, 315, 324, 325, 353, 355, 363, 365, 405, 412, 413, 415, 453, 463, 473, 491. Other required supporting courses: CDFR 211; CDFR 313; NFS 303, 321; Pha 241; Zool 325; HSc 443; Micr 231, Micr 423; Psyc 451.

Twelve credits are allowed as general electives, 6 humanities credits are required to meet core requirements. A total of 136 credits is required for graduation.

For students interested in post-baccalaureate study in nursing, Stat 341, Statistical Methods is recommended as an elective.

\*University core courses — required for graduation.

**Undergraduate Courses**

**Required Courses**

**Level I: Semesters 1 and 2 — Application of Knowledge**

**202 Professional Nursing and the Health Care System I 2(2,0)**  
Overview of professional nursing with introduction to deliberative processes of research and epidemiology used in studying the external environment and the community as a client. Enrollment limited. P, or concurrent Nurs 213.

**203 Communication in Nursing 3(2,3)**  
Communication process and skills required for professional nursing practice. Beginning interviewing skills for taking a health history with individuals/peer group as client. P, Psyc 101, Soc 100. Enrollment limited. P, concurrent Nurs 213.

**213 Introduction to Nursing Process 4(2,6)**  
Deliberative nursing process with emphasis on assessment, nursing diagnosis and selected skills, including basic physical assessment techniques. Simulated laboratory experiences and/or community-based experiences in health screening. Admission to nursing major. P or conc, Micr 231, Zool 325; CDFR 211, NFS 321. Concurrent Pha 241, Nurs 202, 203.

**314 Nursing Process: Adults in Secondary Care\* 4(4,0)**  
Application of deliberative nursing process through making an assessment and nursing diagnoses as basis for beginning planning and intervention for individuals with moderate to high level of health. Pathophysiology of well-defined medical-surgical conditions with high predictability of outcome. P, Nurs 203, 213, Pha 241. P or conc, CDFR 313. Conc, NFS 303.

\*Theory and clinical application courses on the same topic such as these and Nurs 353-355, 324-325, 363-365, 412-413, are companion courses and should be taken concurrently.

**315 Nursing Process: Adults in Secondary Care — Clinical Application 4(0,12)**

Clinical application of content in Nurs 314 including hospital and out-of-hospital settings. P, Nurs 203, 213, Pha 241. P or conc, Nurs 314, CDFR 313, NFS 303.

**353 Nursing Process: Individuals/Groups in Community MH I 2(2,0)**  
Application of nursing process with emphasis on psychosocial assessment and advanced communication skills required for care of individuals and selected groups for promotion of mental health. P, Nurs 203, 213; P or conc, Psyc 451.

**355 Nursing Process: Individuals/Groups in Community MH I — Clinical Application I 2(0,6)**

Clinical application of content in Nurs 353 including hospital and out-of-hospital settings. P, Nurs 203, 213; P or conc, Psyc 451.

## **Level II: Semester 3 and 4, Analysis of Knowledge**

**324 Nursing Process: Child in Primary and Secondary Care 3(3,0)**

Pathophysiology, disturbances in normal growth and development, health care needs and problems of children-infant throughout adolescence. P, Nurs 314, 315, 353, 355. Micr 423 recommended.

**325 Nursing Process: Child in Primary and Secondary Care — Clinical Application 4(0,12)**

Clinical application of content in Nurs 324 in hospital and out-of-hospital settings. P, Nurs 314, 315, 353, 355. P or conc, Nurs 324.

**363 Nursing Process: Childbearing Family in Primary or Secondary Care 3(3,0)**

Normal childbearing process and related pathophysiology. Application of the deliberative nursing process with emphasis on planning and implementation based on the assessment and nursing diagnoses, working with selected communities and childbearing families. P, Nurs 314, 315, 353, 355.

**365 Nursing Process: Childbearing Family in Primary or Secondary Care — Clinical Application 3(0,9)**

Clinical application of content in Nurs 363 including hospital and out-of-hospital settings. P, Nurs 314, 315, 353, 355. P or conc, Nurs 363.

**405 Advanced Nursing Process: Individuals/Groups in Community MH II 2(1,3)**

Advanced nursing care of clients experiencing psychopathology. Clinical application of content in hospital and out-of-hospital setting. P, Nurs 353, 355.

**412 Advanced Nursing Process: Individuals in Tertiary Care 3(3,0)**

Advanced pathophysiology and nursing care of clients with less well-defined conditions with low degree of predictability of outcome. Emphasis on crisis intervention, critical care and rehabilitation. P, Nurs 324, 325, 363, 365.

**413 Advanced Nursing Process: Individuals in Tertiary Care — Clinical Application 4(0,12)**

Clinical application of content in Nurs 412 in hospital and out-of-hospital settings. P, Nurs 324, 325, 363, 365, P or conc, Nurs 412.

**415 Nursing Process: The Community as Client 3(1,6)**

Nursing process applied to community as client. Nursing care of individuals/groups in the community with application of leadership skills. P, Nurs 324, 325, 363, 365. P or conc, HSc 443, Nurs 453.

**453 Leadership in Nursing 2(2,0)**

Utilization of the deliberative process focusing on role of nurse as a leader and working with groups. Emphasis on evaluation phase of nursing process with caring for individuals, families and communities. P, Nurs 324, 325, 363, 365. Conc, Nurs 415.

## **Level III: Semester 5, Synthesis of Knowledge**

**463 Professional Nursing and the Health Care System II 1(1,0)**

Deliberative process applied to the study of issues and trends in nursing in preparation for professional nursing practice. P, Nurs 405, 412, 413, 415, 453.

**473 Introduction to Research in Nursing 1(1,0)**

Application of research process to study problems in nursing and related environmental factors. P, Nurs 405, 412, 413, 415, 453. P or conc, Nurs 463.

**483 Computer Applications in Health Care 3(3,0)**

Capabilities and limitations of computers; basic concepts and principles of system organization and operation; application of computer programs in health diagnosis, treatment and facilities operations; teaching, continuing education and research. P, Math 111 or 113. Open to upper division undergraduate students.

**491 Directed Study in Nursing 1-6(0-2;0-12)**

Consolidation of previous learning. Application of the deliberative nursing process in a realistic work setting. Opportunity to increase self confidence functioning in a variety of nursing roles. Care of clients experiencing varying levels of health and illness. Evaluation of self as well as the practice of nursing in general. ROTC students may substitute Mil 495 ROTC Nursing Advanced Camp for 3 of 6 required credits with approval of Dean, College of Nursing. P, Nurs 405, 412, 413, 415, 453. P or conc, Nurs 463, 473.

## **Optional Undergraduate Courses**

(Availability of these depends on demand and availability of faculty)

**200 Nursing Workshops 1-3** Special session in specific areas of nursing. Approximately 45 hours of work required for each credit, including lecture, conference, committee and group activity, and outside assignments. Workshops in nursing may range from 1 to 3 weeks. Students limited to 4 credits to apply toward degree. P, consent.

**342 Communicable Disease Nursing I 2(2,0)**

Prevention and control. P, consent.

**350 Nursing in the Community 1-6**

Community aspects of planning for health needs. Designed for non-credit or variable assignment of credits. May include some practice.

**351 Seminar in Nursing 1(0,1-2)**

Discussion and evaluation of the impact of nursing action in care of patients. Students limited to 4 credits to apply toward degree.

**352 Communicable Disease Nursing II 2(0,6)**

Clinical experience in meeting the nursing care needs of the patient with a communicable disease. P, consent.

**422 Women in Health Care Professions 2(2,0)**

Women's roles and contributions in health care professions from ancient to modern times. Factors affecting women's activities in these fields. Movements and developments in these fields where women have made significant contributions. Open to nursing and non-nursing students. Elective for junior or senior in nursing or for registered professional nurses. Elective to apply to women's study minor.

**450 Nursing Physical Assessment 3**

Theory and clinical application of theory in relationship to diagnosing human responses in health and disease. Emphasizes independent nursing actions in promotion of health, health maintenance, preventions of injury and disease and in determining care for clients in all health settings. P, Senior standing or consent.

**492 Special Problems in Nursing 1-3**

Open to upper division students by permission. Students limited to 4 credits to apply toward degree. P, consent.

**493 Special Topics in Nursing 1-4**

Study of selected topics in nursing under direction of faculty. Offered on sufficient demand. Senior or consent of instructor.

**494 Cooperative Education in Nursing FSSu**

Opportunity to receive academic credit for work experience related to nursing. Course requirements and amount of credit granted will be determined on an individual basis. Up to four credits may apply toward graduation. P, completion of two semesters of nursing major; permission of department head.

## **Graduate Courses**

**510-610 Theory and Conceptual Frameworks in Nursing 2(2,0)**

A systematic study and interpretation of nursing phenomena by critical examination of theoretical concepts and models.

**520-620 Pathophysiologic Basis for Nursing Practice 2(2,0)**

Manifestations of complex clinical problems analyzed through pathophysiological mechanisms with implications for nursing practice. Assumes a basic knowledge of anatomy and physiology.

**525-625 Human Sexuality in Health Care 3(3,0)**

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 permission of instructor.

**530-630 Nursing Science 2(0,6)**

Experience in systematic assessment of clients/patients in the identification of nursing diagnoses with emphasis on evaluation of nursing intervention.

**535-635 Death and Dying: Principles and Practices of Care 3(3,0)**

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.

**545-645 Management of Acute and Chronic Pain 2(2,0)**

Provides opportunity to identify and discuss management principles of acute and chronic pain with noninvasive and invasive measures. P, Senior or Graduate Nursing Student; other graduate students with consent of instructor.

**555-655 Health and the Older Adult 2(2,0)**

Based on a multidisciplinary perspective, issues and factors affecting the older adult will be analyzed for their implications in planning and implementing nursing and health care for this group. A guided study approach to a conventional course. P, senior or graduate nursing students, graduate or senior students of other health disciplines or by consent.

**565-665 Health Care for Victims of Abuse 3(3,0)**

Provides student opportunities to study the historical perspectives of health care for the victim. P, Psyc 101, Soc 100, seniors or graduate nursing students, graduate or senior students of other health care disciplines or by consent.

**590-690 Seminar: Guided Study in Nursing 1-4**

Investigation of a selected problem in nursing theory or practice. May be repeated for two semesters for variable credit.

**594-694 Research Methods in Nursing 3(3,0)**

Components of the research process with emphasis on research in nursing and the health care system. Prerequisite: statistics course covering description and inferential statistics.

**592-692 Special Problems 1-3(1-3,0-3)**

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 seniors, RN's and/or graduate students by consent. Limit of 3 credits can be applied to a degree.

**595-695 Special Topics 1-3(1-3,0)**

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 seniors, RN's and/or graduate students by consent. Limit of 3 credits can be applied to a degree.

**710 Curriculum Development in Nursing 2(2,0)**

**720 Leadership and Role Development 2(2,0)**

**725 Patient Care Management 3(3,0)**

**760 Concepts in Advanced Nursing I 3(2,3)**

**765 Concepts in Advanced Nursing II 4(2,6)**

**770 Clinical Nursing Specialization 6(3,9)**

**775 Nurse Role Practicum 4-12(0,12-36)**

**780 Seminar in Advanced Nursing 1-3(1-3,0)**

**782 Communication in Advanced Nursing Practice 3(2,3)**

**785 Self Care of the Older Adult 3(3,0)**

**790 Thesis in Nursing 5**

**792 Problems in Nursing Research 1-3**

# Nutrition and Food Science (NFS)

## College of Home Economics

Professor Beattie, Acting Head; Professors Emerti Colburn, Deethardt, Guild, Shank, Willis; Associate Professor Johnson, M. Crews; Assistant Professors G. Crews, Gates, Rosholt; Instructors Collins, Propst

**Majors in Nutrition, Food Science and Restaurant Management**

Options available in the Nutrition and Food Science major are Dietetics, Nutrition, and Food Science. The Restaurant Management major has three curriculum options allowing students to choose from Bachelor of Science or Bachelor of Arts Programs.

**Minors in Nutrition and Food Science**

A minor in Nutrition and Food Science requires 16 semester credits of NFS-prefixed which should include NFS 321 and at least 5 additional hours of courses. All courses for the minor must be approved by the NFS Department. Students planning a minor in Nutrition and Food Science must contact the NFS Department head by the junior year.

**Honors Program**

The Honors program in Nutrition and Food Science meets the needs of the above average student interested in a curriculum leading to a graduate degree. Courses will be determined with the academic adviser.

**Nutrition and Food Science — Dietetic Option**

Dietetics offers a wide variety of jobs in hospitals, nursing homes, public health agencies, industries, schools, universities, the armed services, and state, national and international organizations.

A dietitian must have a good background in the basic sciences as well as the behavioral sciences in applying the science of nutrition to nutritional care of people, sick or well, whether in the hospital or in the community.

The dietitian is essential to the total care of the patient in a health-care facility, giving nutritional guidance and instruction that will continue on an out-patient basis. Dietitians also work in clinical research units. The role of the dietitian is changing with changes in health care. The dietitian has become more involved in preventive health care and in community nutrition programs as an integral part of total health care.

The dietitian finds employment opportunities in many types of institutions and commercial food services. The educational experiences require development of competence in application of modern management theory and the behavioral sciences to the management of food service systems. In the future the use of the computer as a decision-making tool is an important part of the expertise of this dietitian. Dietitians with an interest in mathematics are introducing computer methods in food systems management.

Governmental regulations are requiring the services of the dietitian in federally supported programs. The consulting services of a dietitian are often sought by architects and hospital administrators in planning and equipping food preparation and services facilities.

**Dietetics or Plan IV Program**

The program in dietetics develops an understanding and competency in food, nutrition and management of dietary department. The curriculum is approved by the ADA. Completion of an internship at one of approximately 100 sites in the U.S., a Master's degree in a related field or other ADA approved experience qualifies the student for eligibility to take the registration exam.

	F	S
<b>Freshman Year</b>		
Nutrition & the Family NFS 101.....	2 or	2
Family Development, CDFR 101.....	2 or	2
Clothing the Family, TC 101.....	1 or	1
Housing & the Family, ID 102.....	1 or	1
Managing Family Resources, HE 102.....	2 or	2
Career Exploration, HEd 101.....	1 or	1
Field Experience, HE 101.....	1 or	1
General Chemistry, Chem 110 or Chem 112..	4	
General Chemistry, Chem 114.....		4
Foods Principles, NFS 141.....	4 or	4
Freshman Comp, Engl 101.....	3 or	3
Intro to Sociology, Soc 100.....	3	
Fund of Speech, SpCm 101.....		3
Fitness and Lifetime Activities, PE 100.....	1	1
Algebra, Math 111.....	3 or	3
<b>Sophomore Year</b>		
Macroeconomics Principles, Econ 201.....	3	
Gen Microbiology, Micr 231.....		4
Anatomy, Zool 221.....	3	
Elementary Organic Chemistry, Chem 120.....	4	
Elementary Biochemistry, Chem 260.....		4
General Psychology, Psyc 101.....	3	
Human Nutrition, NFS 321.....		3
Electives/Humanities.....	3	3
Principles of Accounting, Actg 210.....	3 or	3
<b>Junior Year</b>		
Intro to Dietetics, NFS 322.....	5	
Food Service Purchasing, NFS 371.....	2	
Quantity Food Production & Service, NFS 381.....		3
Advanced Food Science, NFS 341.....	4	
Mammalian Physiol., Zool 325.....	4	
Business Management BAd 360.....		3
Junior Comp, Engl 300 or Technical Communication, Engl 303.....	3 or	3
Equipment, Layout and Design, NFS 372.....		3
Food and Beverage Cost Control, NFS 382....	3	
Educational Psychology, EPsyc 302.....		3

<b>Senior Year</b>	<b>F</b>	<b>S</b>	Food Processing, NFS 351.....		3
Institution Organization & Management, NFS 391.....	3		Electives.....	2-4	
Advanced Human Nutrition, NFS 422.....		3	<b>Senior Year</b>	<b>F</b>	<b>S</b>
Clinical Nutrition, NFS 423.....		4	Applied Chemical Instrumentation, Chem 330.....	3	
Community Nutrition, NFS 424.....		3	Advanced Food Science, NFS 341.....	4	
Seminar, NFS 403.....	1		Animal Science Elective.....	3	
Computer-Assisted Food Systems Management, NFS 471.....	3		Technical Control of Dairy Products II, DS 422.....		4
Special Topics, NFS 493.....	0-4 or	0-4	Research Problems, NFS 342.....		3
Electives.....	5-6		Advanced Human Nutrition, NFS 422.....		3

**Suggested electives:**

Human Development and Personality, CDFR 211; Management in Personal and Family Living, HE 241; Dairy Foods, DS 231; Meat: Production to Consumption AS 241; Cultural Anthropology, Anth 220; Food Microbiology, Micr 311, Meal Management, NFS 251, Intro to Med. Sci, Zool 307; Interpersonal Communication, SpCm 201.

**Food Science**

The option in food science prepares students for careers in food production technology, promotion and advertising of foods, food research and development, or for advanced degree programs in food science and technology. Two curricular tracks are provided to guide you in the technical or the promotional aspects of the food industry. Qualified students may also plan an honors curriculum in consultation with a department adviser.

Well-equipped laboratories enable students to receive practical experience while learning the principles of food science. Students may also work part-time in the Nutrition and Food Science research laboratories and earn part of university expenses.

**Food Science (Science/Technical Curriculum)**

**Freshman Year**

Nutrition & The Family, NFS 101.....	F	2
Family Development, CDFR 101.....		2
Clothing & the Family, TC 101.....		1
Housing & the Family, ID 102.....		1
Managing Family Resources, HE 102.....		2
Career Exploration, HEd 101.....	1	
Field Experience, HE 101.....		1
Food Technology, NFS 151.....	2	
Freshman Comp, Engl 101.....	3	
Fitness and Lifetime Activities, PE 100.....	1	
Gen Chemistry, Chem 112.....		4
Foods: Principles, NFS 141.....		4
Algebra, Math 111 or 113.....		3
Gen Psychology, Psyc 101.....		3

**Sophomore Year**

Gen Chemistry, Chem 114.....	F	4
Gen Microbiology, Micro 231.....		4
Technical Control of Dairy Products I, DS 221.....		3
Dairy Foods, DS 231.....		3
Organic Chemistry, Chem 120.....		4
Food Microbiology, Micro 311.....		3
Meats, Production to Consumption, AS 241...		3
Fundamentals of Speech, Spcm 101.....		3
Intro to Sociology, Soc 100.....		3
Electives.....		3

**Junior Year**

Quantative Analysis, Chem 232.....	F	4
Math elective.....	3-5	
Principles of Advertising, MCom 370.....		3
Human Nutrition, NFS 321.....		3
Statistical Methods, Stat 341.....		3
Quantity Food Production, NFS 381.....		3
Junior Comp, Engl 300.....		3

**Food Science (Food Promotion/Advertising Curriculum)**

**Freshman Year**

Nutrition & the Family, NFS 101.....	F	2	
Family Development, CDFR 101.....		2	
Clothing & the Family, TC 101.....		1	
Housing & the Family, ID 102.....		1	
Managing Family Resources, HE 102.....		2	
Career Exploration, HEd 101.....		1	
Field Experiences, HE 101.....			1
Food Technology, NFS 151.....	2		
Freshman Comp, Engl 101.....	3		
Fund. of Speech, SpCm 101.....	3 or		3
Fitness and Lifetime Activities, PE 100.....	1		1
Gen Chemistry, Chem 110.....			4
Foods: Principles, NFS 141.....			4
Algebra, Math 111.....			3
Basic Photography, MCom 160.....			2

**Sophomore Year**

Meal Management, NFS 251.....	F	3	
Meats, Production to Consumption, AS 241...		3	
Organic Chemistry, Chem 120.....		4	
Journalism Typography, MCom 213.....		2	
Intro to Sociology, Soc 100.....		3	
Gen Microbiology, Micr 231.....			4
Junior Comp, Engl 300.....			3
Dairy Foods, DS 231.....			3
Gen Psychology, Psyc 101.....			3
Electives.....	2		3

**Junior Year**

Biochemistry, Chem 260.....	F	4	
Human Nutrition, NFS 321.....		3	
Principles of Advertising, MCom 370.....		3	
Animal Science Elective.....		3	
Consumer and the Market, HE 391.....		3	
Magazine Writing & Editing, MCom 315.....			3
Food Processing, NFS 351.....			3
Writing for Radio & TV, MCom 330.....			2
Publicity Methods, MCom 313.....			2
Statistical Methods, Stat 341.....			3
Dairy Science Elective.....			3

**Senior Year**

Advanced Food Science, NFS 341.....	F	4	
Advanced Exposition, Engl 303.....		3	
Writing in the Sciences, Engl 307.....		2	
Research Problems, NFS 342.....			3
Advanced Human Nutrition, NFS 422.....			3
Advertising Copy and Layout, MCom 371.....			3
Broadcast Advertising, MCom 372.....			3
Experiences in Adult Education, HEd 421.....			2

Humanities Electives.....	6	
Electives.....	2	3
<b>Suggested electives:</b>		
Biology, Bio 151, 153; Environmental Chemistry, Chem 380; Introduction to Computers and Programming, CSc 311; Institution Organization and Management, NFS 391; Community Nutrition, NFS 424; Radio and TV Production, MCom 331; Intro to Printing, Prt 112; Macroeconomics Principles, Econ 201.		

### Restaurant Management

The Department of Nutrition and Food Science offers three curricula in restaurant management. The degree may be earned in either the College of Home Economics (Bachelor of Science) or in the College of Arts and Science (Bachelor of Science, Bachelor of Arts).

The program provides a firm foundation in food preparation and food service management supported by a strong background in business and economics. In addition, most students have the opportunity to receive practicum credit for on-the-job work experience.

Students enrolled in either of the Arts and Science curricula must meet the Core requirements of that College.

Students will be prepared for careers in hotels, motels, restaurants, private clubs, airlines; or in industrial, institution or health facilities food service management.

Students with up to two years of general education credits will usually find that most of their credits will transfer into this program.

### Curriculum in Home Economics, Restaurant Management Major Leading to the Bachelor of Science degree

	F	S	Credit
<b>Freshman Year</b>			
Nutrition & the Family, NFS 101.....	2	or 2	2
Family Development, CDFR 101.....	2	or 2	2
Clothing and the Family, TC 101.....	1	or 1	1
Housing and the FAmily, ID 102.....	1	or 1	1
Managing Family Resources, HE 102.....	2	or 2	2
Career Exploration, HED 101.....	1	or 1	1
Field Experience, HE 101.....	1	or 1	1
Foods Principles, NFS 141.....	4	or 4	4
Intro to Hospitality Industry, NFS 171.....	2		2
Fitness & Lifetime Activities, PE 100.....	1	or 1	1
Freshman Comp, Engl 101.....	3	or 3	3
Fund of Speech, SpCm 101.....	3	or 3	3
General Psychology.....		3	3
Natural Science.....	4	or 4	4
Algebra, Math 111.....	3	or 3	3

<b>Sophomore Year</b>	F	S	
Natural Science.....	4	4	4
Food Service Purchasing, NFS 371.....		2	2
Quantity Food Production, NFS 381.....		3	3
Meat, Production to Consumption, AS 241.....	3		3
Dairy Foods, DS 231.....	3		3
Macroeconomics Principles, Econ 201.....	3		3
Microeconomics Principles, Econ 202.....		3	3
Prin of Accounting I, Actg 210.....	3		3
Prin of Accounting II, Actg 211.....		3	3
Electives/Humanities.....		3	3
Intro to Sociology, Soc 100.....	3		3

<b>Junior Year</b>	F	S	
Equipment, Layout and Design, NFS 372.....		3	3
Business Law, BAd 350.....	3		3
Survey of Nutrition, NFS 221.....		3	3
Prin of Advertising, MCom 370.....	3		3
Junior Comp, Engl 300.....		3	3
Food and Beverage Cost Control, NFS 382.....	3		3
Electives/Humanities.....	3	4	4

<b>Senior Year</b>	F	S	
Institution Organization, Management, NFS 391.....	3		3

Computer-Assisted Food Service Management, NFS 471.....		3	3
Professional Practicum in Food Service.....	0-12		0-12
Research Problems in Food Service, NFS 342.....			3
Hospitality Industry Law, NFS 361.....			2
Food Service Operational Mgt., NFS 481.....			3
Special Topics, NFS 461.....	0-4	0-4	0-4
Electives/Humanities.....	0-16		3-7

### Curriculum in Arts and Science, Restaurant Management Major Leading to the Bachelor of Science degree

	F	S	Credit
<b>Freshman Year</b>			
Foods Principles, NFS 141.....			4
Intro to Hospitality Industry, NFS 171.....	2		2
Freshman Comp, Engl 101.....	3	or 3	3
Fund of Speech, SpCm 101.....	3	or 3	3
Fitness & Lifetime Activities, PE 100.....	1		1
General Psychology, Psyc 101.....	3	or 3	3
Intro to Sociology, Soc 100.....	3	or 3	3
Algebra, Math 111.....	3	or 3	3

<b>Sophomore Year</b>	F	S	
Macroeconomics Principles, Econ 201.....	3		3
Microeconomics Principles, Econ 202.....			3
Prin of Accounting I, Actg 210.....	3		3
Prin of Accounting II, Actg 211.....			3
Food Service Purchasing, NFS 371.....			2
Quantity Food Production, NFS 381.....			3
Natural Sciencé.....	4	or 4	4
Meat, Production to Consumption, AS 241.....	3	or 3	3
Electives/Humanities.....	3-7		1-5

<b>Junior Year</b>	F	S	
Business Management, BAd 360.....			3
Institutional Organization & Management, NFS 391.....			3
Money and Banking, Econ 330.....	3		3
Marketing, Econ 353.....			3
Junior Comp, Engl 300.....	3	or 3	3
Dairy Foods, DS 231.....	3		3
Business Law, BAd 350.....	3		3
Hospitality Industry Law, NFS 361.....			2
Food and Beverage Cost Control, NFS 382.....	3		3
Equipment, Layout & Design, NFS 372.....			3
Electives/Humanities.....	1		3

<b>Senior Year</b>	F	S	
Computer-Assisted Food Service Management, NFS 471.....		3	3
Labor, Law & Economics, Econ 382.....	3		3
Risk Management, Econ 453.....	3		3
Prin of Advertising, MCom 370.....	3		3
Food Service Operational Management, NFS 481.....			3
Professional Practicum, NFS 497.....	0-12	or 0-12	0-12
Electives.....			

### Curriculum in Arts & Science, Restaurant Management Major Leading to the Bachelor of Arts degree

This curriculum is especially appropriate for students considering foreign employment opportunities in the hospitality industries.

	F	S	Credit
<b>Freshman Year</b>			
Foods Principles, NFS 141.....	4		4
Intro to Hospitality Industry, NFS 171.....	2		2
Freshman Comp, Engl 101.....	3	or 3	3
Fund of Speech, SpCm 101.....	3	or 3	3
Fitness & Lifetime Activities, PE 100.....	1		1
General Psychology, Psyc 101.....	3	or 3	3

Intro to Sociology, Soc 100.....	3	or	3
Algebra, Math 111.....	3	or	3
Foreign Language.....	4		4
<b>Sophomore Year</b>	<b>F</b>		<b>S</b>
Macroeconomics Principles, Econ 201.....	3		
Microeconomics Principles, Econ 202.....			3
Prin of Accounting I, Actg 210.....	3		
Prin of Accounting II, Actg 211.....			3
Food Service Purchasing, NFS 371.....			2
Quantity Food Production, NFS 381.....			3
Natural Science.....	4	or	4
Meat, Production to Consumption, AS 241.....	3	or	3
Electives or Humanities.....	3-7		1-5
Foreign Language.....	3		3
<b>Junior Year</b>	<b>F</b>		<b>S</b>
Institutional Organization & Management, NFS 391.....	3		
Money and Banking, Econ 330.....	3	or	3
Junior Comp, Engl 300.....	3	or	3
Dairy Foods, DS 231.....	3		
Hospitality Industry Law, NFS 361.....			2
Food and Beverage Cost Control, NFS 382....	3		
Equipment, Layout & Design, NFS 372.....			3
Electives/Humanities.....	4		4
<b>Senior Year</b>	<b>F</b>		<b>S</b>
Computer-Assisted Food Service Management, NFS 471.....	3		
Labor, Law, & Economics, Econ 382.....	3		
Risk Management, Econ 453.....	3		
Business Law, BAd 350.....			3
Prin of Advertising, MCom 370.....	3		
Food Service Operational Mgm't., NFS 481....			3
Professional Practicum, NFS 497.....	0-12	or	0-12
Electives.....			

Note: Students in the College of Arts & Science who wish an Economics minor must also choose one of the following courses: Econ 301, 302, 433, or Stat 341.

## Nutrition and Food Science (NFS)

### Undergraduate Courses

#### 101 Nutrition & the Family 2(2,0) FS

Family nutritional needs at various development stages from prenatal and infancy through adulthood to aging.

#### 111 Food and Man 2(2,0) FS

Considerations of the role of food, and man's use of food substances, in the development and growth of human cultures. Study of the cultural, social and economic impacts of food.

#### 141 Foods: Principles 4(2,6) FS

Scientific investigation of basic foods used to maintain optimum nutrition.

#### 151 Food Technology 2(2,0)

Survey of the technology used in the conversion of raw foods into finished food products suitable for human consumption. World and domestic food needs, chemical additives and food safety will be discussed. Required of all food science majors.

#### 171 Introduction to the Hospitality Industry 2(2,0) F

History, organizational structure, and trends in the hospitality industry. Place of lodging and food service establishments in the state and national economy.

#### 221 Survey of Nutrition 3(3,0) FS

Fundamentals of nourishing the body properly and the role that food plays in meeting the nutritional requirements of individuals. Designed for the student who lacks a science background but wishes to study human nutrition in some detail.

#### 251 Meal Management 3(1,4) FS

Planning, purchasing, preparing and serving food for the family. Selection and preparation of low-cost meals, convenience foods, and ethnic foods. Case study of meal planning at specific income levels. P, 141 or consent.

#### 303 Diet Therapy 1(1,0) FS

Discussion of role of nutrition or diet intervention in treatment of patients/clients with particular emphasis on dietary management of pathological conditions. Students will become familiar with methods and materials of therapeutic nutrition. P, NFS 321, concurrent with Nurs 324.

#### 321 Human Nutrition 3(3,0) FS

The science of food, the nutrients and other substances therein, their action, interaction, and balance in relation to health and disease and the processes by which the organism ingests, digests, absorbs, transports, utilizes and excretes food substances. P, Chem 111 or 120 or consent.

#### 322 Introduction to Dietetics 4(3,2) F

Principles of dietetics and the roles of the professional dietitian. Terminology of the health professions and the function of the dietitian as a member of the health team. P, 321 or consent.

#### 341 Advanced Food Science 4(2,6) F

Study of physical/chemical factors affecting food quality resulting from preparation and processing methods. Students will become familiar with techniques in sensory evaluation and basic principles of food analysis. P 141 and Chem 120.

#### 342 Research Problems in Nutrition, Food Science & Food Systems 3(1,6) S

Investigation of problems in nutrition, food science and/or food systems management with results submitted as a technical paper. P, 341.

#### 351 Principles of Food Processing 3(2,3) S

Study of the physical/chemical principles and approaches used in heat processing, freezing, dehydration, and fermentation of foods. Current processing methods will be considered in terms of preparation, processing, packaging, and quality control of food products. P, Chem 110 or 114, NFS 151, or consent.

#### 361 Hospitality Industry Law 2(2,0) S

This course presents common and civil law as it relates to the operation of various hospitality industry enterprises. Preventative law is presented to permit managers to be aware of potential legal pitfalls and steps required to minimize legal problems. P, Business Law (BAd 350) alternate years.

#### 371 Food Service Purchasing 2(1,3) F

Purchasing food and supplies for food service establishments. Quality evaluation, specifications, record keeping inventory control systems.

#### 372 Equipment, Layout & Design 3(1,4) S

Planning food service facilities with emphasis on kitchen layout, food service facilities design, equipment and furniture selection. A study of management factors which affect the human element in food production and service.

#### 381 Quantity Food Production & Service 3(1,6) S

Management of production and service of quantity food in institutions and commercial establishments. Experience in planning, preparing and serving meals in a variety of food service establishments. P, 371 or consent.

#### 382 Food and Beverage Cost Control 3(3,0) F

A comprehensive study of those factors which affect operating costs in establishments serving food and beverages. Ways to analyze food, beverage and labor costs will be studied. Cost control methods including an introduction to computer assisted management records and reports. Control of sales including various types of cash registers. P, 381.

#### 391 Institution Organization & Management 3(3,0) F

Management principles in food service facilities including organization, personnel policies, job analysis, employee selection, training, evaluation, supervision of production areas. P, 371, 381.

#### 403 Seminar 1(1,0) FS

Presentation and discussion of topics based on nutrition, foods and institutional management literature in professional journals and related resources. Open to advanced students in dietetics, food science and restaurant management. P, junior standing in dietetics, food science or restaurant management.

#### 422 Advanced Human Nutrition 3(3,0) S

Principles of physiological chemistry and physiology applied to nutrition. P, 321, Zool 221 and 325, Chem 260 or consent.

#### 423 Clinical Nutrition 4(4,0) S

Role of nutritional intervention in pathological conditions. P, 422 or concurrent enrollment.

#### 424 Community Nutrition & Consulting Dietetics 3(2,2) S

Application of learning principles, teaching methods and knowledge of nutrition in community nutrition education programs and out-patient nutrition counseling. Introduction to the role of the consultant dietitian. P, 321.

#### 471 Computer-assisted Food Service Management 3(2,3) F

Simulated day to day transactions using the computer to assist in management decisions. Use of data files for inventory and production control, food cost accounting and analysis of patient nutrient intake. P, NFS 371, 381, 391. Concurrent enrollment in NFS 391 permitted.



**481 Food Service Operational Management 3(1,6) S**

An advanced food production and service course. The student is required to plan, prepare, serve, evaluate and calculate costs for meals prepared for special occasions. Students are required to assume total responsibility for special meals. Meals are prepared and served in university dining rooms or the Student Union. P, 381, consent. Alternate years.

**493 Special Topics 1-4 FSSu**

In the following and other selected areas: nutrition, clinical dietetics, food service systems management, food science, hospitality industries. P, junior standing in dietetics, food science or restaurant management and consent.

**494 Professional Practicum 1-12 FSSu**

Supervised work or clinical experience in dietetics, food service or hospitality management, nutrition programs or in food industries. P, consent.

**Graduate Courses**

**503-603 Seminar in Food & 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.

**561-661 Special Problems in Food & Nutrition 1-3**

Special study in food and nutrition. P, consent.

**724 Recent Developments & New Approaches in Human Nutrition 3(3,0)**

Emphasis on new concepts in nutrition and resultant impact of changing dietary patterns on health and behavior. Insights essential for recognition of dietary needs and practical educational techniques to evoke favorable changes in food consumption patterns. (on sufficient demand)

**734 Techniques in Nutrition Research 3(1,6)**

Laboratory experience using methods, measurements and instruments for obtaining nutritional data. P, Chem 260 or consent. (On sufficient demand)

**743 Current Topics in Foods 3(3,0)**

**Pharmacy (Pha)**

**College of Pharmacy**

**Curriculum in Pharmacy**

First Year	F	S
Fitness and Lifetime Activities, PE 100.....	1	1
Fr Comp, Engl 101.....	3	
Gen Chem, Chem 112.....	4	
Intro Biology, Bio 151.....	3	
Fund of Speech, SpCm 101.....		3
*Algebra and Trig, Math 113.....		5
Macroeconomics Principles, Econ 201.....		3
†Electives.....	6	6
Second Year	F	S
Elem Physics, I-II, Phys 111-113.....	4	4
Organic Chem, Chem 120.....	4	
Intro to Pharmacy, Pha 251.....	1	
Gen Microbiology, Micro 231.....	4	
Anatomy, Zool 221.....		3
Chemical Properties and Analysis, Pha 221....		4
Pharmacy I, Pha 211.....		3
Drug Literature Evaluation, Pha 210.....		1
Pharmaceutical Calculations, Pha 313.....		1
†Electives.....	4	
Third Year	F	S
Pharmacy II, Pha 312.....	4	
Pharmaceutical Biochem, Pha 323.....	5	
Pharmacognosy I-II, Pha 331-332.....	3	4
Inorganic Medicinals, Pha 222.....	3	
Interpersonal Communications, SpCM 201.....	3	
Organic Medicinals, Pha 421.....		4
Biopharmaceutics and Pharmacokinetics, Pha 411.....		4
Mammalian Physiology, Zool 325.....		4
Fourth Year	F	S
Organic Medicinals, Pha 422.....	4	
Pharmacology I-II, Pha 541-542.....	5	4

Junior Comp, Engl 300.....	3	
Prescription Practice, Pha 412.....		5
Drug Therapy, Pha 545-546.....	3	3
Toxicology, Pha 543.....		2
Pharmaceutical Jurisprudence, Pha 314.....	3	
†Pharmacy elective.....		2-3
Fifth Year	F	S
OTC Products, Pha 517.....	2	
†Pharmacy elective.....	2-3	
†Electives.....	4-5	
Externship, Pha 515.....		6
Clinical Pharmacy, Pha 513.....		6
The Geriatric Patient, Pha 519.....	3	
Pharmacy Management, Pha 552.....	3	

\*Mathematics 113, Algebra and trigonometry, is required as a minimum. College Algebra, Math 111 and Trigonometry, Math 120, may be used as substitutes. Students exempt from Math 113 by examination need not choose any other mathematics, but are encouraged to do so.  
 †Electives should be selected to satisfy university core requirements.  
 ‡A minimum of 5 credits of Pharmacy electives are required.

It will be noted that some pharmacy courses have prerequisites such as "3rd year standing", etc. These are defined as follows:

3rd year standing — the student must have completed Chemistry 120, Physics 113, Zoology 221, Microbiology 231, Pharmacy 210, 211, 221 and 313.

4th year standing — completion of, Pharmacy 312, 323, 332, 411, 421 and Zoology 325.

5th year standing — completion of Pharmacy 412, 422, 542, 543, 546 and 314.

**Specialty Tracks**

Suggested electives for specialty tracks are listed in the following sections. Students should discuss their plans with an adviser.

<b>1. Community Pharmacy</b>	<b>Credits</b>
Agricultural Pharmacy, Pha 431.....	3
Pharmacy Marketing, Pha 425.....	2
Adverse Drug Reactions, Pha 414.....	2
Current Topics, Pha 401.....	1
Accounting, Actg 210.....	3
Business Law, B-Ad 350.....	3
Programming with Basic, CSc 112.....	2
<b>2. Institutional Pharmacy (A residency following graduation is highly recommended.)</b>	<b>Credits</b>
Current Topics, Pha 401.....	1
Hospital Pharmacy, Pha 554.....	3
Adverse Drug Reactions, Pha 414.....	2
Advanced Pharmacokinetics, Pha 440.....	2
Pharmaceutical Marketing, Pha 425.....	2
Statistical Methods, Stat 341.....	3
Abnormal Behavior, Psyc 451.....	3
Death and Dying, Rel 360.....	3
Bioethics, Phil 383.....	3
Programming with Basic, CSc 112.....	2
Business Law, B-Ad 350.....	3
Accounting, Actg 210.....	3
<b>3. Clinical Pharmacy (Pharm.D. degree is highly recommended.)</b>	<b>Credits</b>
Current Topics, Pha 401.....	1
Hospital Pharmacy, Pha 554.....	3
Advanced Pharmacokinetics.....	2
Adverse Drug Reactions, Pha 414.....	2
Programming with Basic, CSc 112.....	2
Statistical Methods, Stat 341.....	3
Pharmaceutical Research, Pha 455.....	1-3
<b>4. Graduate Study</b>	<b>Credits</b>
General Chemistry, Chem 114.....	4
Fundamentals of Organic Chemistry, Chem 224.....	4
Math Analysis, Math 123, 224.....	5,4

Physical Chemistry, Chem 342, 344.....	3,3
Statistical Methods, Stat 341.....	3
Mathematical Statistics, Stat 381.....	3
Introduction to Programming with FORTRAN, CSc 312 ...	3
Pharmaceutical Research, Pha 455.....	3
Advanced Pharmacokinetics, Pha 440.....	2

Students preparing for graduate study may, with permission of the Curricular Variations Committee, waive one or more of the following courses.

Chemical Properties and Analysis, Pha 221.....	4
Pharmacy Management, Pha 552.....	3
Geriatric Patient, Pha 519.....	3
OTC Products, Pha 517.....	2
Pharmacy Electives.....	5

### 5. Pharmacy — MBA Track

This track is available to those students who desire to receive a degree in Pharmacy and a Master of Business Administration Degree. This program will require some summer course work and a sixth year of study at the University of South Dakota.

<b>First Year</b>	<b>F</b>	<b>S</b>
Fitness and Lifetime Activities, PE 100.....	1	1
Fr Comp, Engl 101.....	3	
Gen Chem, Chem 112.....	4	
Intro Biology, Bio 151.....	3	
Fund of Speech, SpCm 101.....		3
Algebra and Trig, Math 113.....		5
*Macroeconomics Principles, Econ 201.....		3
Electives.....	6	6

<b>Second Year</b>	<b>F</b>	<b>S</b>
Elem Physics I-II, Phys 111-113.....	4	4
Organic Chem, Chem 120.....	4	
Intro to Pharmacy, Pha 251.....	1	
Gen Microbiology, Micr 231.....	4	
Anatomy, Zool 221.....		3
Chemical Properties and Analysis, Pha 221....		4
Pharmacy I, Pha 211.....		3
Drug Literature Evaluation, Pha 210.....		1
Pharmaceutical Calculations, Pha 313.....		1
Electives.....	4	

<b>Third Year</b>	<b>F</b>	<b>S</b>	<b>Su</b>
Pharmacy II, Pha 312.....	4		
Pharmaceutical Biochemistry, Pha 323.....	5		
Pharmacognosy I-II, Pha 331-332.....	3	4	
Inorganic Medicinals, Pha 222.....	3		
Interpersonal Communications, SpCm 201.....	3		
Organic Medicinals, Pha 421.....		4	
Biopharmaceutics & Pharmacokinetics, Pha 411.....		4	
Mammalian Physiology, Zool 325.....		4	
*MBA Core Courses at SDSU.....			6-9

<b>Fourth Year</b>	<b>F</b>	<b>S</b>	<b>Su</b>
Organic Medicinals, Pha 422.....	4		
Pharmacology I-II, Pha 541-542.....	5	4	
Prescription Practice, Pha 412.....		5	
Drug Therapy, Pha 545-546.....	3	3	
Toxicology, Pha 543.....		2	
Pharmaceutical Jurisprudence, Pha 314.....	3		
Pharmacy Elective.....		2-3	
Jr. Comp., Engl 300.....	3		
*MBA Core Courses at SDSU.....			6-9

<b>Fifth Year</b>	<b>F</b>	<b>S</b>
The Geriatric Patient, Pha 552.....	3	
*Pharmacy Management, Pha 552.....	3	
OTC Products, Pha 517.....	2	
Pharmacy Elective.....	2-3	

*Electives.....	4-5		
Externship, Pha 515.....			6
Clinical Pharmacy, Pha 513.....			6

<b>*MBA Core Courses Available at SDSU</b>	<b>Credits</b>
Economics, Econ 202, 203.....	3,3
Accounting, Actg 210, 211.....	3,3
Business Law, B-Ad 350.....	3
Pharmacy Management, Pha 552.....	3
Pharmacy Marketing, Pha 425.....	2
Business Finance, B-Ad 310.....	3
Business Statistics, Stat 341.....	3

<b>Sixth Year (USD Graduate School of Business)</b>	<b>F</b>	<b>S</b>	<b>Su</b>
Financial Administration, BA 710.....	3		
Quantitative Analysis, BA 720.....	3		
Managerial Economics, Econ 782.....	3		
Electives (Approved by MBA Director).....	3		
Managerial Accounting, Acct 781.....		3	
Organizational Theory & Behavior, BA 761....		3	
Business & Its Environment, BA 762.....		3	
Advanced Information Systems, BA 722.....		3	
Electives (Approved by MBA Director).....		2-3	
Production, BA 760.....			3
Administrative Policy, BA 780.....			3
Marketing Administration, BA 770.....			3
Advanced Economics.....			3

## Pharmaceutical Sciences (PHA)

### College of Pharmacy

Professor Hietbrink, Head; Professor Omodt, Chappel; Associate Professors Cascella, Houglum.

### Undergraduate Courses

<b>211 Pharmacy I</b> 3(2,3) S
Theory, preparation, and application of pharmaceutical solution dosage forms. P, 2nd year standing in pharmacy, Chem 120.
<b>221 Chemical Properties &amp; Analysis</b> 4(3,3) S
Descriptive inorganic chemistry as it relates to pharmacy. Lewis acidic and basic properties of various ions, relationship of these properties to compound solubility, product constants and ionization constants. Laboratory procedures derive from and reinforce the lecture material relative to qualitative analysis of various ions and titrimetric and instrumental quantitative analysis. P, Chem 112, 2nd year standing.
<b>241 Pharmacology</b> 3(3,0) FS
Basics of pharmacology and therapeutics for nurses and others. P, Chem 111, current enrollment in Zool 325.
<b>312 Pharmacy II</b> 4(3,3) F
Theory, preparation, and application of pharmaceutical solid, plastic, and polyphasic dosage forms. P, 3rd year standing.
<b>321 Inorganic Medicinals</b> 3(3,0) F
Inorganic compounds having pharmaceutical or medicinal value, stressing chemical properties, physical properties, uses, incompatibilities and doses. P, 3rd year standing.
<b>323 Pharmaceutical Biochemistry</b> 5(4,3) F
Chemistry of living organisms as basis for understanding metabolism and pharmacological action of medicinal preparations. P, 3rd year standing.
<b>331 Pharmacognosy I</b> 3(3,0) F
Drugs from plant and animal sources which include alkaloids, vitamins, antibiotics, immunologic agents and selected hormone products. Sources, isolation, chemical and physical properties, actions and uses. P, 3rd year standing.
<b>332 Pharmacognosy II</b> 4(3,3) S
Continuation of 331. P, Pha 331.
<b>411 Biopharmaceutics and Pharmacokinetics</b> 4(3,3) S
Physio-chemical relationships of pharmaceutical dosage forms and their practical application. Introduction to biopharmaceutics and pharmacokinetics and dosage form adjustment. P, Pha 312.

### 421 Organic Medicinals 4(4,0) S

Nomenclature and properties of organic compounds as they relate to pharmacy and medicine. Structure-activity relationships, incompatibilities, uses and doses. P, 3rd year standing, Pha 321, 323.

### 422 Organic Medicinals 4(4,0) F

Continuation of 421. P, Pha 421, 4th year standing.

### 440 Advanced Pharmacokinetics 2(2,0) F

Theory and application of compartmental models for the study of the time course of drugs in the body. P, Pha 411.

### 455 Pharmaceutical Research 1-3(0,3 per credit) FS

Students may elect research problems in one of the pharmaceutical sciences, biopharmaceutics, pharmaceuticals, pharmaceutical chemistry, pharmacognosy or pharmacology. P, consent.

### 493 Special Topics 1-3 FS

Organized by an instructor in consultation with the Department Head and a group of students. The course will normally be taught only once or sporadically for a unique group of students.

### 541 Pharmacology 5(4,3) F

Basic principles of pharmacology and therapeutics. Laboratory illustration (student participation) of drug action. P, 4th year standing.

### 542 Pharmacology 5(4,0) S

Continuation of 541. P, Pha 541.

### 543 Toxicology 2(2,0) S

Toxicology and medicolegal aspects of poisonings. Common poisons with emphasis on antidotal measures. P, 541.

## Pharmacy Practice (PHA)

### College of Pharmacy

Associate Professor: Billow, Head; Professor Hopponen; Professors Emeriti Eidsmoe, Gross; Assistant Professors Halbert, Koestner, Larson, Mason, Powers, Van Riper; Instructor Hendricks.

### Undergraduate Courses

#### 201 Use and Misuse of Drugs 2(2,0) FS

Principles of drug action, examination of medical and legal aspects of use and misuse of prescription, non-prescription and illicit drugs. Not open to pharmacy students.

#### 210 Drug Literature Evaluation 1(1,0) S

Sources of drug information. Strategies of question negotiation and utilization of drug literature. P, 2nd year standing.

#### 251 Introduction to Pharmacy 1(1,0) F

Practice, literature, ethics, history, organization and regulation. The pharmaceutical industry and its relation to the profession. Medical Terminology.

#### 313 Pharmaceutical Calculations 1(1,0) S

Systems of weights and measures and mathematical problems encountered in pharmaceutical practice. P, 2nd year standing.

#### 314 Pharmaceutical Jurisprudence 3(3,0) F

State and federal laws and regulations. P, 4th year standing.

#### 401 Current Topics in Pharmacy 1(1,0) S

Films and discussions on topics of interest not included in more formalized courses. P, 4th or 5th year standing.

#### 412 Prescription Practice 5(3,4) S

Pharmacist's professional role in dispensing medications. P, 4th year standing, Pha 422, 541, 545.

#### 414 Adverse Drug Reactions 2(2,0) S

Study by organ systems of untoward reactions to therapeutic agents. Clinical presentations of representative reactions include pathophysiology, mechanisms, complications and treatments. P, Pha 541.

#### 425 Pharmaceutical Marketing 2(2,0) S

Marketing functions of the manufacturer, wholesaler and practitioner. P, 4th year standing.

#### 431 Agricultural Pharmacy 3(2,2) F

Animal health care including visits to livestock units on campus. P, 4th year standing.

#### 455 Pharmaceutical Research 1-3(0,3 per credit) FS

Students may elect research problems in an appropriate area of pharmacy practice. P, consent.

#### 493 Special Topics 1-3 FS

Organized by an instructor in consultation with the Department Head and a group of students. The course will normally be taught only once or sporadically for a unique group of students.

### 513 Clinical Pharmacy (6) FS

Cooperative clinical experience in several types of professional environments. P, 5th year standing.

### 515 Pharmacy Externship 6 FS

Cooperative clinical experience in a selected community and an institutional pharmacy. Ten weeks in an outlined program under the supervision of a practitioner-preceptor. P, 5th year standing.

### 517 OTC Products 2(2,0) FS

Survey of activity, therapeutic utility, side-effects and drug interactions of major classes of non-prescription proprietary drug products. P, 5th year standing.

### 519 The Geriatric Patient 3(2,1)/2(2,0) FS

Psychological, social and physiological aspects of aging with attention to the altered health care needs of geriatric patients and their altered medication requirements. P, 5th year standing or consent.

### 545 Drug Therapy I 3(3,0) F

Pathophysiology and drug therapy of disease states by organ system with emphasis on etiology, pathogenesis, complications, drug selection, dosage regimen and interactions. P, 4th year standing.

### 546 Drug Therapy II 3(3,0) S

Continuation of Pha 545. P, Pha 541, 545.

### 552 Pharmacy Management 3(3,0) FS

Economic and professional considerations in management of a pharmacy. P, 5th year standing.

### 554 Hospital Pharmacy 3(2,1) S

Drug distribution and control in hospitals. P, 4th year standing.

## Philosophy and Religion (Phil-Rel)

### College of Arts and Science

Professor Norlin, Head; Professors Fee, Nelson; Associate Professor Kedl

Philosophy may be characterized as one's attempt to find a meaningful perspective from which to view oneself, one's world and one's place in that world. Students from any major may profit from philosophy.

The academic study of religion involves the use of critical and interpretative skills in examining the vast range of ideas, practices, and writings that are reflected in religion.

Present course work is designed to enrich the student's perspectives and introduce some of the important features of philosophy and religion.

A minor in Philosophy is available in either the B.A. or B.S. program. The minor requires 16 credit hours of philosophy, including Phil 205. Of these 16 hours, 6 must be in upper division courses.

A minor in Religion may be pursued in either the B.A. or the B.S. program. Completion of the minor requires 15 credit hours of religion.

Pre-ministerial students are advised to explore the pre-professional offerings. Contact the department.

### Philosophy (Phil)

#### 205 Introduction to Philosophy 4(4,0) FS

Inquiry into some of the basic problems of philosophy leading to an appreciation of the place and value of philosophy in the intellectual community, and intellectual activities of the student.

#### 215 Introduction to Social/Political Philosophy 3(3,0) FS

The search for order for society; major political and social theories from Socrates to the present and critical analysis of these theories. The relation of theories of human nature, metaphysics, epistemology, and ethics to the order in society.

#### 225 Introduction to Ethics 3(3,0) FS

Major ethical theories, investigation of some of the problems arising from these theories, and a critical analysis of the validity of these theories in light of your own ethical intuitions.

#### 235 Elementary Logic 3(3,0) FS

Investigation of informal and formal (symbolic) reasoning to promote thoughtfulness in one's academic and personal life.

### 312 Great Ideas of the Western World 4

Begins on the assumption that ideas have been profound instruments of change and development in human culture. Explores some of the fundamental ideas which have shaped western civilization and how much our contemporary world is a product, not simply of war, plague and commerce, but also of the way humanity has understood the world.

### 331 Philosophy of Science 3(3,0) FS

Analysis of nature and goals of scientific knowledge and logical structure of physical, biological, and social sciences in terms of natural law, scientific theories, and explanations.

### 383 Bioethics 4(4,0)

(cross-listed as Biology 383)

### 491 Directed Studies

See general description in College of Arts and Science Alternatives and Options.

### 423 Political Philosophy 3(3,0) FS

### 424 Modern Political Theory 3(3,0) FS

(See Political Science 461, 462)

### 455 Special Problems in Philosophy 1-3(1-3,0) FSSu

(May be repeated for a total of 12 hours.)

### 493 Undergraduate Course Specials

See general description in College of Arts and Science Alternatives and Options.

### 494-495-496 Cooperative Education/Internship/Field Experience

#### (Topical)

See general description in College of Arts and Science Alternatives and Options.

## Religion (Rel)

### 213 Introduction to Religion 3(3,0) FS

The nature of religion and faith, contemporary developments in religion, and current problems from religious perspectives.

### 226 Old Testament 3(3,0) F

Old Testament and Intertestamental literature and its relevance for today.

### 227 New Testament 3(3,0) S

New Testament and early church literature and its implications for church history.

### 237 Religion in America 3(3,0) F

Analysis in historical perspective of the major religious movements in the U.S.: Judaism, Protestantism, Roman Catholicism, with particular emphasis upon their cultural context and relationship to American life and thought — past, present, and future.

### 312 Dynamics of Body, Mind and Spirit 3

The new work dealing with the relationship of the physiological dimension with mind and consciousness and new developments regarding the relation of spirit, mind and body. These include efforts to develop more holistic approaches to illness and health, also research into such traditional religious disciplines as Zen, Yoga and meditation, and more recent disciplines such as relaxation techniques, bio-feedback and body awareness.

### 331 Feminism and Theology 3(3,0)

A critical examination of traditional theological areas from the perspective of feminist theologians. Areas covered include women in the Bible, Church history, and the contemporary Church.

### 338 World Religions 3(3,0) S

Major world faiths: Hinduism, Buddhism, Confucianism, Taoism, Judaism, Islam, Christianity, and possible developments in the modern world.

### 349 Current Issues in Religion 3(3,0) F

Selected issues in contemporary religious life and thought, such as the religion of the "counter culture"; the emergence of new sects; religion in relation to environmental issues and technology; religion and social change. May be repeated for a total of nine hours credit.

### 360 Moral and Ethical Perspectives on Death and Dying

Attitudes and issues that focus on death and dying in society, the religious and moral dimensions of these attitudes and issues. P, Rel 213 or Phil 205, or consent of instructor.

### 491 Directed Studies

See general description in College of Arts and Science Alternatives and Options.

### 493 Undergraduate Course Specials

See general description in College of Arts and Science Alternatives and Options.

### 494-495-496 Cooperative Education/Internship/Field Experience

#### (Topical)

See general description in College of Arts and Science Alternatives and Options.

## Physics (Phys)

### College of Engineering

Professor W. Hein, Head; Professors Duffey, Graetzer, Miller, Professor Emeritus Parker, Williams; Associate Professor Leisure; Assistant Professors Kitterman, Lynch, Rauber, Sippel; Instructor T. Hein.

Two main objectives are considered in the organization of course work in this department. First, that the basic courses meet the needs of students in the various colleges of the university who need basic physics. Second, the sequence of advanced courses makes it possible to follow one of two curricula which specialize in the engineering and science of physics. The department is well supplied with laboratory and lecture-demonstration equipment and other facilities in support of these objectives.

The curriculum in Engineering Physics, administered in the College of Engineering, is built around a strong core of physics courses supported by allied courses from engineering departments. It is designed to give the ability to apply new research developments to pressing problems of society. Students interested in industrial employment should consider this program. Electives can be chosen to emphasize either electrical or mechanical aspects. Two major areas of employment are applied nuclear physics and solid state. A graduate with this background may enter employment immediately as an Engineer or continue graduate work in physics or another field such as Nuclear Engineering, Electrical Engineering, or Mechanical Engineering.

The other curriculum leads to a B.S. degree with a physics major in the College of Arts and Science. The program is so arranged that with proper choice of electives a student may emphasize training for one of several careers. One elective area leads to a strong physics major suitable for planning toward graduate work and eventually a position in research or university teaching. A second elective area includes all professional education courses that are required to enter secondary teaching. A third elective area leaves 38 hours of electives, giving maximum flexibility. For instance, a student pursuing meteorology as a career should choose elective courses in climatology, geography, and computer science. A student pursuing a career in medical physics should choose elective courses in physiology, anatomy, microbiology and electronics. A more complete listing of elective courses for various technical careers is available in the Physics Department office.

To be eligible for graduation in either physics major, you must have a "C" average or above for all physics courses. An average of "C" or above must also be obtained for the three courses; Physics 211-213 (or Physics 111-113) and Physics 331. Any deviations from departmental requirements must be approved by the Department Head of Physics.

### Curriculum in Engineering Physics

128 Semester Credits Required for the Bachelor of Science degree

	Credit	
	F	S
<b>Freshman Year</b>		
Mathematical Analysis I-II, Math 123-224.....	5	4
General Chemistry, Chem 112, and 114.....	4	3
Fr Comp, Engl 101 & Fund of Speech, SpCm 101.....	3	3
Engineering Design Graphics I, EG 121.....		2
General Physics I, Phys 211.....		4
Fitness & Lifetime Activities, PE 100.....	1	1
Orientation for Engineers, GE 110.....	0	
PASCAL Programming, CSc 114.....	3	
<b>Sophomore Year</b>		
Mathematical Analysis III, Math 225.....	3	
General Physics II, Phys 213.....	4	
Differential Equations, Math 321.....		3
Introduction to Literature, Engl 218.....		3

Atomic Physics, Phys 331 .....	3		
Microeconomics Principles, Econ 201 .....	3		
Electric Circuits I, EE 215 .....	3		
Metal Processing, ES 225 or 235 .....	1		
Computer Programming & Data Processing, CSc 271 .....	4		
*Non-technical electives .....	3		
†Technical electives .....	2		
<b>Junior Year</b> .....	<b>F or S</b>		
Classical Theoretical Physics, Phys 351 .....	3		
Optics, Phys 361 .....	3		
Measurement Theory and Experiment Design, Phys 312 .....	1		
Advanced Laboratory II, Phys 314 .....	1		
Thermodynamics & Statistical Mechanics, Phys 341 .....	3		
Modern Theoretical Physics, Phys 371 .....	3		
Advanced Engineering Mathematics, Math 331 .....	3		
Junior Composition, Engl 300 or Technical Communications Engl 303 .....	3		
*Non-technical electives .....	3		
†Technical electives .....	7		
<b>Senior Year</b> .....	<b>F or S</b>		
Introductory Nuclear Physics, Phys 433 .....	3		
Theory of Electricity, Phys 421 .....	3		
Advanced Laboratory III, Phys 412 .....	1		
Advanced Laboratory IV, Phys 414 .....	1		
Electronics I, Elec 320 .....	3		
Electronics Lab I, Elec 322 or Electrical In- struments, EE 317 .....	1		
Electronics II, Elec 321 .....	3		
Physics of the Solid State, Phys 439 .....	3		
†Technical electives .....	9		
*Non-technical electives .....	3		
Free electives .....	2		
Physics Colloquium, Phys 497 .....	1		

\*Non-technical electives are provided to strengthen cultural growth and education in the humanistic and social science areas. At least 12 credits must be selected from the representative list shown on pages 15-16 and should be logical and purposeful selections having the approval of the Physics Department chairman and must meet university requirements.

†Technical elective program will be planned and coordinated according to the interest and aptitude of the student and approved by the academic adviser. Technical electives must be approved by the Department Head if not listed below.

### Suggested Technical Electives

Statistics, EM 221 and Dynamics, EM 222; Engineering Mechanics, EM 223; Fluid Mechanics, EM 331; Physical Climatology & Meteorology, AgE 353; Metallurgy, ME 341; Heat Transfer, ME 415; Electrical Materials I, EE 265; Basic Electrical Engineering I, EE 305; Electronics III, Elec 420; Electromagnetic Field Theory, EE 385; Electronics Lab, Elec 322; Digital Systems, EE 345; Electrical Materials II, EE 365; Microprocessor System Design, EE 447; Computer Architecture & Organization, EE 449; Modern Algebra, Math 313; Linear Algebra, Math 315; Mathematical Statistics, Math 381; Laplace Transform, Math 433; Complex Variables, Math 521; Advanced Calculus I-II, Math 523-524; Vector Analysis, Math 527; Partial Differential Equations, Math 531; Introduction to Numerical Computation, Math 373; Theory of Probability, Math 583; Atomic and Molecular Spectra, Phys 437; Special Projects, Phys 495; Plasma Physics, Phys 525; Reactor Physics, Phys 535; Science of Solids, Phys 537-637; Physical Chemistry, Chem 342 and 344; Inorganic Chemistry, Chem 452; Instrumental Analysis, Chem 434; Biology 200 level or higher courses; all Computer Science courses of number higher than 312.

Credit in Phys 494, Cooperative Education/Internship/Field Experience particularly encouraged as a technical elective for those interested in industrial employment.

### Curriculum in Arts and Science, Physics Major

Leading to the Bachelor of Science degree  
128 Semester Credits Required

<b>Freshman Year</b> .....	<b>F</b>	<b>S</b>
Fr Comp, Engl 101 or Speech SpCm 101 .....	3	3
Algebra & Trigonometry, Math 113 .....	5	
Mathematical Analysis I, Math 123 .....		5
Fitness & Lifetime Activities, PE 100 .....	1	1
General Chemistry, Chem 110 or 112 and 114 or 120 .....	4	3
Biology, Botany, or Zoology .....	3	3
Electives .....		1

<b>Sophomore Year</b> .....	<b>F</b>	<b>S</b>
Mathematical Analysis II-III, Math 224-225 .....	4	3
Elementary Physics I-II, Phys 111-113 or General Physics I-II, Phys 211-213 .....	4	4
PASCAL Programming, CSc 114 .....	3	
Technology and Society, GE 231 .....		2
Electives .....	5	4
Computer Science elective .....		3

<b>Junior Year</b> .....	<b>F or S</b>
Atomic Physics, Phys 331 .....	3
Junior Composition, Engl 300 .....	3
Optics, Phys 361 .....	3
Advanced Lab II, Phys 314 .....	1
Physics Colloquium, Phys 497 .....	1
Electives .....	20

<b>Senior Year</b> .....	<b>F or S</b>
Philosophy of Science, Phil 331 .....	3
Electives .....	30

### Elective Areas of Study

<b>I. Professional Physics</b> .....	
Classical Theoretical Physics Phys 351 .....	3
Modern Theoretical Physics, Phys 371 .....	3
Measurement Theory and Experiment Design, Phys 312 ..	3
Thermodynamics, Phys 341 .....	3
Physics of the Solid State, Phys 439 .....	3
Introductory Nuclear Physics, Phys 433 .....	3
Advanced Laboratory III-IV, Phys 412-414 .....	2
Theory of Electricity, Phys 421 .....	3
Differential Equations, Math 321 .....	3
Social Science electives from approved list (additional) ..	10
Humanities electives from approved list (additional) .....	6
Additional electives .....	18

<b>II. Science Teaching</b> .....	
Psychology, Psyc 101 .....	3
Practicum & Professional Laboratory Experiences, SeEd 287 .....	2
Introduction to American Education, EdFn 339 .....	2
Educational Psychology, EPsyc 302 .....	2
Educational Measurements, EdEr 415 .....	2
Methods of Teaching in Secondary Schools, SeEd 400 .....	3
Strategies in Science Teaching, SeEd 416 .....	3
Principles of Guidance, CGPS 410 .....	2
Audio-Visual Methods and Materials, SeEd 405 .....	2
Indian Studies, Hist 368 or Anth 421 .....	3
Teaching of Reading, SeEd 450 .....	3
Supervised Student Teaching SeEd 488 .....	8
Physics electives .....	5
Chemistry or Biology Electives .....	4
Descriptive Astronomy, Phys 103 .....	3
Social Science electives from approved list (additional) ..	4
Humanities electives from approved list (additional) .....	6
Differential Equations, Math 321 .....	3

<b>III. General Physics</b> .....	
Physics electives .....	8
Social Sciences electives from approved list (additional) .....	10
Humanities electives from approved list (additional) .....	6
Additional electives .....	36

## Curriculum in Arts and Sciences Physics Minor

The physics minor consists of a minimum of 17 credit hours of physics. Eleven of these must consist of Elementary Physics 111 and 113 or General Physics 211 and 213 together with Atomic Physics 331. The six remaining credit hours can be chosen from all remaining courses in the Physics Department except Physics 101.

## Undergraduate Courses

### 101 Introductory Physics 4(3,2) FS

One-semester course. Concepts, vocabulary and methods of the science. P, Algebra 111 or consent. (Credit will not be allowed in both 101 and 111-113 or 211-213.)

### 103 Descriptive Astronomy 3(3,0) FS

Introductory course: moon, sun, planets, constellations, galaxies, stellar evolution, radio astronomy, black holes, instrumentation, use of telescopes for viewing.

### 111 Elementary Physics I 4(3,2) FS

First semester of a year course, primarily for students in the biological, agricultural, and health sciences. Mechanics, heat, wave motion. P, Math 111. (Credit will not be allowed in both 111-113 and 211-213)

### 113 Elementary Physics II 4(3,2) FS

Continuation of 111. Electricity, light, atomic and nuclear physics. P, 111.

### 211 General Physics I 4(3,2) FS

For students in physical science and engineering, Mechanics and Thermodynamics. P, concurrent registration in Math 224. (Credit will not be allowed in both 111-113 and 211-213.)

### 213 General Physics II 4(3,2) FS

Continuation of 211. Electricity, waves, and optics. P, 211.

### 312 Measurement Theory and Experiment Design 3(1,3) S

Selected experiments from various branches of physics. Emphasis on precision and analysis of experimental error. P, junior standing in physics.

### 314 Advanced Laboratory II 1(0,3) F

Selected experiments, primarily in optics.

### 326 Electrical Measurements 1(0,3)

DC and AC bridge measurements of resistance, inductance, and capacitance. Display and measurements of transients and magnetic effects. P, 213.

### 331 Atomic Physics 3(3,0) FS

Atomic and nuclear structure with emphasis on impact of 20th century developments on science and engineering. P, 213 or 113 and consent.

### 341 Thermodynamics & Statistical Mechanics 3(3,0) S

Thermodynamic systems from macroscopic approach considering first and second laws of thermodynamics and their consequences, and from microscopic approach via kinetic theory of gases and statistical mechanics. P, 213 or 113 and Math 225.

### 351 Classical Theoretical Physics 3(3,0) F

Vectors, dyadics, tensors, matrices, spinors, symmetry arguments. Newtonian, Lagrangian, Hamiltonian mechanics. Galilean and Einstein relativities. P, EM 223.

### 361 Optics 3(3,0) F

Intermediate course in geometrical and physical optics with principal emphasis on physical optics. Analysis of refraction phenomena, thick lenses, wave nature of light, interference, diffraction, and polarization. P, 213 or 113 with consent.

### 371 Modern Theoretical Physics 3(3,0) F

Nature of space, time and particles. Quantization of translatory motion, rotatory motion, vibratory motion, motion in a Coulombic field. Operators, wave packets, potentials, forces. P, 331 or consent.

### 412 Advanced Lab III 1(0,3)

Selected experiments in modern physics: gamma ray spectroscopy, half life, beta decay, positron annihilation, neutron capture, bubble chamber events, nuclear statistics, etc.

### 414 Advanced Lab IV 1(0,3)

Continuation of 412 into individualized projects. Also, experiments in solid state physics, such as electron spin resonance and diamagnetism.

### 421 Theory of Electricity 3(3,0) S

Principles of electricity and magnetism, with applications to dielectric and magnetic materials. Development of Maxwell's equations, and applications. P, 213.

### 433 Introductory Nuclear Physics 3(3,0)

Radioactivity, nuclear spectra and structure, particle accelerators, fission and fusion, radiation safety, high energy particles.

### 437 Atomic & Molecular Spectra 3(3,0) S

Atomic and molecular structure in terms of vector model and quantum mechanics. P, concurrent registration in 371.

### 439 Physics of the Solid State 3(3,0) F

Electronic processes with reference to electrical properties of metals, semiconductors and insulators. P, 331, Math 321.

### 464 Senior Design 3(1,6) S

Students will design a piece of equipment, an experiment or design and assemble a system to perform a particular measurement or engineering task. A complete analysis of the design including a literature review and an oral and written report is required. P, Phys 312.

### 490 Physics Colloquium 1(1,0) FS

Recent developments in the field of physics, and topics of related interest. Participation required for physics majors for any 2 semesters during the junior or senior year.

### 493 Special Topics 1-3 FS

Special problems. P, consent.

### 494-495-496 Cooperative Education/Internship/Field Experience 1-4 FSSu

Planned and supervised professional experience related to physics or engineering physics which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

## Graduate Courses

### 521-621 Electrodynamics 3(3,0) S

Complex quantities, circuits, Maxwell's equations, waves in general, planar, cylindrical, and spherical waves, approximation methods, plasmas. P, 421.

### 525-625 Plasma Physics 3(3,0) S

Elementary processes in a plasma, trajectories of charged particles, collective effects, creation of plasma, plasma instabilities, applications. P, 421.

### 535-635 Reactor Physics 3(3,0) S

Fission process: moderation and diffusion of neutrons, critical equation, reactor control, environmental effects, and nuclear fusion reaction. P, 331.

### 537-637 Science of Solids 3(3,0)

Topics covered to satisfy student interests in areas such as magnetism, semi-conductors, superconductors, ferroelectrics, and devices based on these aspects of solids. The role of defects in solids and strength of materials may also be included. P, 331, and 439 or consent.

### 571-671 Quantum Mechanics 3(3,0)

Bra-ket formalism, Galilean invariance principles, localizability of particles, rotational symmetries, step operators, variational procedures perturbation methods, transitions. P, 371.

### 575-675 Tensors & General Relativity 3(3,0)

Covariance in physics, basic tensor algebra and calculus, affine connections, the Riemann tensor, field equations, linear approximations, the Schwarzschild solution. P, 351.

### 595-695 Special Topics 1-3 FS

Individualized special projects. P, consent.

### 743 Statistical Mechanics 2(2,0)

### 751 Theoretical Mechanics 3(3,0) F

### 779 Group Theory in Quantum Mechanics 3(3,0)

### 790 Thesis 5-7

## Planning (Plan)

Professor Hogan, chairman and coordinator.

Planning is an essential part of most private and public activities. It is a process that can be learned and applied to increase effectiveness in decision making and operations.

The Minor in Planning (Master's Degree Level) and teaching Planning courses are governed by a Coordinating Committee appointed by and responsible to the Vice President For Academic Affairs.

## Graduate Courses

### 591-691 Principles of State, Regional and Community Planning 3(3,0)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.

**592-692 Techniques of State, Regional and Community Planning**  
3(3,0)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 691.

(See also specialized courses in planning within departmental listings in Economics, Education, Engineering, Geography, Horticulture-Forestry, Political Science and Sociology.)

**Plant Pathology**

(See Plant Science)

**Plant Science (PS)**

**College of Agriculture and Biological Sciences**

Professor Horton, head; Professors Arnold, Buchenau, Kantack, Kenefick, Lay, McDaniel, Moore, Reeves, Walgenbach, Walstrom, White; Professors Emeriti P. Carson, Fine, Gardner, Kinch, Semenik, Shank, Shubeck; Associate Professors Cholick, Easton, Even-son, Kohl, Lemme, Lunden, Malo, Smolik, Wrage; Assistant Profes-sors Beck, Boe, Bonnemann, M. Carson, Carlson, Ferguson, Fixen, Gallenberg, Geise, Gellner, Gerwing, Hall, Pollmann, Schumacher, Stymiest, Weeldreyer, Wicks; Instructors Gutormson, Sorenson.

**Courtesy Appointments:**

The following staff members are employed outside the Plant Science Department but work cooperatively with Department staff and carry an adjunct professor appointment in the department: (Bi-ology) Chen; (Chemistry) D. Evenson; (Northern Grain Insect Re-search Laboratory-USDA/AR) Branson, Dybing, Fisher, Gustin, Kahler, Kieckhefer, Sutter; (North Central Soil Conservation Re-search Laboratory, Morris, MN-USDA/AR) Benoit, Caske, Lind-strom, Olness; (University of South Dakota) Hoffman.

The primary goal of the department is to prepare you for leader-ship in business and farming enterprises related to crop production, insect control, plant disease control, pest management, and soil management. In addition, you can prepare for graduate study lead-ing to a career in research, teaching, or extension.

Graduates with training in plant science are sought by agri-busi-ness, private foundations, and federal and state agencies for em-ployment in domestic and international agriculture. Plant science, with its variety of disciplines, provides an excellent background for independent pursuits in farming or ranching.

The Department offers instruction leading to the Bachelor of Science Degree with a major in Agronomy. Four options are offered in the major: (1) Business, (2) Plant Protection, (3) Production, and (4) Soils.

The choice of an option need not be made until the sophomore or junior year. This enables you to become familiar with the broad field of plant science and through consultation with faculty and ad-visers, to develop a program that can satisfy your needs.

The Department is equipped with modern classroom, laborato-ry, greenhouse, and field plot facilities. Numerous opportunities are available for part-time employment, scholarships, and work-study programs. The Agronomy and Conservation club offers opportuni-ties for fellowship, leadership, and career planning.

Graduate study opportunities may lead to Master of Science or Doctor of Philosophy degrees.

**Agronomy Major**

Provides broad training in plant science and in crop production technology. This major is recommended for students interested in either agricultural production or the agri-business areas of crops and soils. Individuals can prepare for careers in farming or ranch-ing; for work with private industry producing agricultural products, such as fertilizers; for processing grain or hybrid seed; for work with government agencies, such as the Cooperative Extension Service, Farmers Home Administration, Commodity Credit Corporation, Agricultural Research and Marketing.

**Curriculum in Agriculture, Agronomy Major**  
Leading to the Bachelor of Science degree.

<b>Freshman Year</b>	<b>F</b>	<b>S</b>
Crop Production, PS 103.....	3	
Intro Biology, Bio 151.....	3	
Botany, Bot 200 3 or Intro Biology II, Bio 153.....		3
Fr Comp, Engl 101.....	3	
Fitness & Lifetime Activities, PE 100.....	1	1
Intro to Sociology, Soc 100.....		3
Fundamentals Of Speech, Spcm 101.....		3
Option and Elective Courses**.....	6	6
	<b>16</b>	<b>16</b>

<b>Sophomore Year</b>	<b>F</b>	<b>S</b>
Soils, PS 113.....		3
Elementary Org Chem, Chem 120.....	4	
Principles of Economics I, Econ 201.....		3
Computer Science 112 or 212 or higher.....	1-3	
Humanities Electives*.....	3	3
Option and Elective Courses**.....	6-8	7
	<b>16</b>	<b>16</b>

<b>Junior Year</b>	<b>F</b>	<b>S</b>
Soil Fertility & Fertilizers, PS 323.....		3
Principles of Plant Pathology, PS 223.....	3	
General Microbiology, Micro 231.....		4
Geology, PS 243.....		3
Junior Comp, Engl 300.....	3	
Option and Elective Courses**.....	10	6
	<b>16</b>	<b>16</b>

<b>Senior Year</b>	<b>F</b>	<b>S</b>
Undergraduate Seminar, PS 490.....	1	1
Plant Physiology, Bot 427.....	4	
Statistical Methods I, Stat 341.....	3	
Crop and Livestock Insects, PS 293.....		3
Social Science Elective*.....		3
Option and Elective Couses**.....	8	9
	<b>16</b>	<b>16</b>

\*See approved list, page 15  
\*\*See selected option

<b>Production Option</b>	<b>Credits</b>
Course	
Algebra, Math 111 or Algebra and Trig. Math 113.....	3 or 5
Gen Chemistry, Chem 110 or 112.....	4
Intro Physics, Physics 101 or 111.....	4
Ag Marketing, Econ 354.....	3
Climatology, AE 353 or An. Nutr., AS 223.....	3
Technical Writing, Engl 303 or Pub. Methods, MCom 313 ...	3 or 2
Genetics, Bio 371.....	3
Weed Control PS 343.....	3
Plant Sci. Electives (at least one course from each of 3 areas listed below***).....	10
Unrestricted Electives.....	20-25

		Crop
<b>Crops Courses</b>		<b>Protection Courses</b>
Seed & Grain Tech, PS 303-3		Regulation and Appl Pesticides, PS 253-3
Grain & Seed Prod. & PS 312-2		Environ. and Plt. Health, PS 322-2
Forages, PS 313-3		Diseases of Field Crops, PS 333-3
World Cropping, PS 433-3		General Entomology, PS 305-3
Plant Breeding, PS 443-3		Mycology, PS 453-4
		Integrated Crop Pest Management, PS 521-3
		(Weed Control, PS 343 in soils option)
		<b>Soils Courses</b>
		Soil Geography, PS 310-4
		Soil Physics, PS 352-3
		Soil Conservation, PS 372-2
		Soil Chemistry, PS 412-2
		Irrigation, PS 483-3

### Business Option

Course	Credits
Algebra, Math 111 or Algebra and Trig, Math 113	3 or 5
Gen Chemistry, Chem 110 or 112	4
Intro Physics 101 or 111	4
Technical Writing, Engl 303 or Pub Methods, MCom 313	3 or 2
Weed Control PS 343	3
Princ. of Econ II, Econ 202	3
Princ. of Act., Actg 210	3
Ag. Marketing, Econ 354	3
Business Administration, BAd 360	3
Business Electives (see following list)	6
Plant Science Electives (at least one course from each of 3 areas on list***)	10
Unrestricted Electives	11-17

\*\*\*See production option for list of approved courses in crops, crop production and soils areas.

### Business Electives

Prin. of Accounting II	Actg 211-3
Personal Finance	B Ad 280-3
Business Finance	B Ad 310-3
Business Law I	B Ad 350-3
Business Law II	B Ad 351-3
Money and Banking	Econ 330-3
Marketing Management	Econ 452-3

### Soils Option

Course	Credits
Algebra and Trig, Math 113 or Math 111 and 120	5 or 6
Math Analysis I, or Calculus for Non-math majors, Math 123 or 222	5
Gen Chemistry, Chem 112 and 114	8
Intro Physics, Physics 111 and 113	8
Quantitative Analysis, Chem 232	4
Technical Writing, Engl 303	3
Climatology, AE 353	3
Soil Microbiology, Micro 412	3
Soil Conservation, PS 372	2
Soil Geography, PS 310	4
Soil Physics, PS 352	3
Soil Chemistry, PS 412	2
Irrigation, PS 483	3
Unrestricted Electives	4-7

### Plant Protection Option

Course	Credits
Algebra, Math 111 or Algebra & Trig, Math 113	3 or 5
Gen Chem, Chem 110 or 112	4
Intro Physics, Elem Physics I, Phys 101 or 111	4
Field Application & Reg. of Pest., PS 253	3
Plant Taxonomy, Bot 301	4
Weed Control, PS 343	3
Communication Elective	2 or 3
Agrostology, Bot 305	3
Diseases of Field Crops, PS 333	3
Weeds of the NC States, PS 341	1
General Entomology, PS 305	3

Environment & Plant Health, PS 322	2
Irrigation, PS 483	3
Unrestricted Electives	17-22

AGRONOMY MINOR: PS 103, 113, 223, 490, plus 6 additional credits of Plant Science courses.

ENTOMOLOGY MINOR: Requires 16 hours from any of the following courses: PS 191, 253, 293, 295, 305, 391, 393, 492.

PLANT PATHOLOGY MINOR: PS 223, 333, 453, plus 7 additional credits selected from the following courses: Bio 371, Bot 261, 427, Micr 231, PS 293.

SOILS MINOR: PS 113, 243 or 310, 323, 352, 490, plus 3 or 4 additional credits from Plant Science courses or Chem 232, Phys 111, Bot 427, Ag Eng 353.

Students who plan to teach in secondary schools should consult the Dean of the Education Division regarding 24 hours in Education required for certification.

## Plant Science Courses (PS)

### Undergraduate Courses

#### 103 Crop Production 3(2,2) FS

Practices and principles; crop distribution; growth processes; response to environment. Grain and forage crops, including their distribution, use, improvement, growth, harvesting, and marketing.

#### 113 Soils 3(2,2) FS

Development and classification of soils; physical, biological, and chemical properties; management aspects, including water, fertility, and erosion; soils in the environment. P, Chem 110 or equivalent recommended.

#### 191 Household Pest Control 2(1,2) FS

Pests in relation to household, stored products, and other environmental considerations; their life cycles, importance and control.

#### 223 Principles of Plant Pathology I 3(2,2) F

Principles underlying cause, spread, symptomology, diagnosis, and control of plant diseases. Principles exemplified by detailed study of specific diseases. Laboratory stresses diagnosis and experimental elucidation of principles. P, Bio 151, and Bio 153 or Bot 200.

#### 243 Geology 3(3,0) S

Geologic processes, including rock weathering, work of wind, ground water, streams, glaciers, lakes, oceans, volcanism, mountain formation, origin of earth, minerals, and rocks. P, Chem 110 or equivalent.

#### 253 Field Application & Regulation of Pesticides 3(2,2) S

General field methods and equipment for applying pesticides, including formulations, calibrations, toxicology, and handling precautions; environmental effects of pesticides; federal and state regulations; classifications of pesticides. Chem 120 recommended.

#### 293 Crop & Livestock Insects 3(2,2) S

Major problems of insect damage to crops, rangeland, and livestock in the Great Plains region and a current review of effective control measures to include biological, natural, chemical, cultural, and legal controls.

#### 295 Horticultural Insects 3(2,2) F

Major problems of insect and related invertebrate damage of horticultural plants and a current review of effective control measures to include biological, natural, chemical, cultural, and legal controls.

#### 303 Seed & Grain Technology 3(2,2) AY S (Offered in 1987)

Seed testing and judging. Grain market grading and quality determinations. Seed anatomy, physiology, dormancy, and aging processes. Identification and classification of crop and weed seeds. P, 103 or HO 111.

#### 305 General Entomology 3(2,2) FS

Provides an understanding of how insects influence man's existence and well-being. Describes the current knowledge of the various procedures that may be employed to control insects.

#### 310 Soil Geography & Land Use Interpretation 4(2,4) F

Relationship of soil characteristics and soil classification to land use interpretations. Laboratory exercises involves field and laboratory procedures used in soil survey investigations. Field trip. P, 113 or consent.

#### 312 Grain & Seed Production & Processing 2(2,0) AY S (Offered in 1988)

Distribution, adaptation, and culture of grain crops. Production and harvesting of seed crops. Seed processing, cleaning procedures, machinery, conditioning drying, storage, and marketing; production of certified and hybrid seed crops. P, 103 or HO 111.



**313 Forage Crops & Pasture Management 3(2,2) F**

Grasses and legumes; their establishment, management, and use for hay, pasture, and silage. P, 103.

**320 Crop Judging 1 or 2 (0,3 per credit) FS**

Seed and plant identification of crops and weeds, seed analysis and grain grading. Students are expected to enroll in the spring semester for prejudging and in the fall to compete in regional and national contests. May be repeated for maximum of 3 credits. P, 103 required, 303 recommended.

**321 Soil Judging 1(0,3) FS**

Practical experience in evaluating the physical and chemical properties of soils important in soil judging and in making land use decisions. Soil forming factors, soil classification, land use interpretations, and soil morphology. Participation in regional intercollegiate soil judging contests. May be repeated for a maximum of 3 credits. P, 113 required, 310 recommended.

**322 Environment & Plant Health 2(2,0) AY S (Offered in 1988)**

Plant diseases caused by non-living environmental factors emphasizing variable climatic factors, soil moisture extremes, nutrient deficiencies, and excesses, air pollution, and pesticides. Laboratory and greenhouse tours provide practical examples of how the environment relates to plant health.

**323 Soil Fertility & Fertilizers 3(3,0) S**

Soil fertility management and its effects on the growth of crops, including evaluation, uptake and utilization of specific ions by plants, use of fertilizer elements to alter soil fertility, importance of crop residue management to maintain and improve productivity, and chemical composition of fertilizers and their characteristics. P, 113 and Chem 110.

**333 Diseases of Field Crops 3(2,2) AY S (Offered in 1987)**

Extensive survey of diseases affecting major food, fiber, and oilseed crops of the world. Emphasis is on diagnosis and disease management strategies. P, 223.

**334 Diseases of Horticultural Crops 3(2,2) AY F (Offered in 1987)**

Diagnosis and control of horticultural crop diseases. Emphasis is placed on diagnostic skills. Crops covered include shade trees, fruit crops, vegetables, bedding plants, tropicals, and turf. P, 223 or consent of instructor.

**341 Weeds of the North Central States (0,2) F**

Introduction to weeds common to the North Central states. Plant identification by vegetative characteristics. Plant and seed collections required. Desirable antecedent, Bot 261.

**343 Weed Control 3(3,0) F**

Principles of chemical, mechanical, cultural, and biological methods of control; factors affecting control, weed control systems for agronomic crops, pastures, shelterbelts, and lawns. P, 103. PS 253 and Chem 120, desirable antecedent.

**352 Physical Environment of Soils & Plants 3(2,2) AY S (Offered in 1988)**

Physical properties and environment of the earth's surface as related to soil management, plant growth, ecology, and pollution abatement. P, 113 and completion of the agriculture core curriculum requirements in mathematics and physics.

**372 Conservation & Management of Soils 2(2,0) AY F (Offered in 1988)**

World, national, and state, soil resources; economics, social causes of erosion; extent and significance of soil loss; management and practices for water and soil conservation; significance of erosion to environment. P, 113.

**373 Rural Real Estate Appraisal 3(2,2) F**

Principles and practices of rural real estate appraisal. Principles of soils valuation and their application for farmland appraisal. Cost, market data, and income approaches to farmland and building appraisal. Introduction to tax, loan and other specialized rural appraisal procedures. Half-day field trips to area farms are required. P, AE 271 and PS 113. Cross-referenced with AgEc 373.

**391 Beekeeping 3(1,4) S**

Provides experience in morphology, disease detection, and control; recognition of honey bee communication, parthenogenesis, honey grading, and colony management.

**393 Insects Affecting Man and Animals 3(2,2) AY F (Offered in 1987)**

Relationship of arthropods (insects, ticks, mites and relatives) to disease in man (public health) with emphasis on the northern Great Plains. Open to upperclassmen.

**412 Soil Chemistry 2(2,0) AY S (Offered in 1987)**

Chemical reactions and properties of clay minerals, organic matter, major and minor nutrient elements, and salts which affect soil formation and agricultural use.

**433 World Crop & Soil Resources 3(3,0) F**

Survey of the grain, root, sugar, beverage, oil, rubber, vegetable, and fiber crops grown in the world. Factors influencing crop production and soil formation on a global scale. P, 103 or 113 or consent. Cross-referenced with Geog 433.

**443 Plant Breeding 3(3,0) S**

Plant breeding as applied to field crops and horticultural varieties with particular emphasis on the relationship of genetics and allied subjects. P, 103, Bio 371.

**453 Mycology 4(2,4) AY F (Offered in 1988)**

Structures, life histories, and classification of fungi.

**483 Irrigation — Crop & Soil Practices 3(3,0) S**

Problems of irrigated agriculture. Soil salinity and salt-affected soils, water quality, management of irrigated crops; cropping systems; water, fertility requirements of irrigated agriculture, water movement, storage, and release in soils. P, 113 and Math 111.

**490 Undergraduate Seminar 1(1,0) FS**

Review of literature and original investigations in field crops, plant pathology, and soils with written and oral reports. Two hours required for graduation.

**492 Special Problems 1-4 FSSu**

Assigned readings, research, and written reports. Limit of four hours in each major for B.S. degree. P, consent.

**493 Special Topics in Plant Science (As arranged) FSSu**

Qualified students may investigate special topics under supervision of department staff in selected areas.

**494 Cooperative Education in Plant Science 1-12 FSSu**

Planned and supervised professional experience related to Plant Science which takes place outside the formal classroom with private business, industry, or public agencies. Provides practical experience to supplement classroom training and reinforce career objectives. Written reports required. Application for permission to register must be made prior to the experience. P, consent of department program coordinator.

**495 Internship in Plant Science 1-12 FSSu**

Supervised off campus experience with a crop production or soil science related enterprise. Provides practical experience to supplement classroom training and reinforce career objectives. Written reports required. Application for permission to register must be made.

**496 Field Experience in Plant Science 1-6 FSSu**

Planned and supervised field experience to supplement classroom training. Application for permission to register must be made prior to the experience. P, consent.

## Graduate Courses

**504-604 Virus & Bacterial Diseases of Plants 4(2,4) AY F (Offered in 1988)**

Plant diseases caused by 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.

**511-611 Insect Ecology and Biological Control 3(2,2) AY S (Offered in 1987)**

Insects in relation to their environment. Effects of microclimate and macroclimate on predators, parasites, disease, reproduction, development, and feeding habits of insects. Techniques for determining various factors important to survival and reproduction in the insect's environment. P, Bio 211.

**513-613 Host-Plant Pathogen Interactions 3(2,2) AY S (Offered in 1987)**

Influence of various host-pathogen interactions on plant disease epidemics. Physical, physiological and genetic interactions are considered from both individual and population viewpoints. Basic epidemiology and disease prediction systems are examined in relation to interacting populations. P, consent.

**521-621 Integrated Crop Pest Management 3(3,0) S**

The biological and ecological basis of integrated pest management for midwestern crop insects are emphasized as they relate to an understanding of economic thresholds for the insect pests. Pest scouting techniques for major crop pests and simulated control decisions are discussed.

**523-623 Insect Physiology 3(2,2) AY S (Offered in 1987)**

Fundamental physiological processes in insects including digestion, respiration, excretion, locomotion, function of the senses, and hormonal effects. Normal functioning of adult and immature stages, developmental physiology and physiology of behavior. P, Chem 260 or equivalent and consent.

**533-633 Advanced Soil Genesis 3(2,3) AY S (Offered in 1988)**

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.

**534-634 Plant Nematology 3(2,4) AY F (Offered in 1987)**

Nematode diseases of plants with emphasis on collection, isolation, preservation, symptomatology, identification, life histories, and control of plant parasitic nematodes. P, consent.

**543-643 Physical Properties of Soils 3(3,0) AY F (Offered in 1988)**

Exchange of energy and water at soil surfaces, infiltration and redistribution of water, and soil physical properties related to plant growth. Applications in development and utilization of soil and water resources consistent with preservation of environmental quality. P, consent.

**544-644 Soils and Plant Nutrition 3(3,0) AY S (Offered in 1987)**

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.

**553-653 Advanced Genetics 3(3,0) AY F (Offered in 1988)**

Procedures in genetic studies as they relate to molecular and classical genetic applications. P, Bio 371.

**554-654 Chemical Properties of Soils 4(4,0) AY F (Offered in 1987)**

Chemical considerations of the dynamic interactions of the soil solid-water-gas phases as affected by climate, matter, added fertilizer elements, and plants. P, consent.

**561-661 Taxonomy of Insects 3(3,0) AY F (Offered in 1988)**

Collection, identification, and classification of insects. Techniques of identifying the groups of economic insect pests that affect the production of feed, food, and fiber.

**563-663 Environment & Physiological Aspects of Crop Production 2(2,0) AY S (Offered in 1987)**

Systems analysis of factors which limit or increase crop production and the potential for qualitative and quantitative adjustments. P, Bot 427 and consent.

**571-671 Principles of Insecticide Use 3(3,0) AY F (Offered in 1987)**

Provides the professional entomologist with a knowledge of the accepted testing methods for determining the efficacy of a substance as an insect control agent. Emphasizes the environmental and health concerns which must be demonstrated in properly testing a substance for use as an insect control agent.

**573-673 Cytogenetics 3(2,3) AY F (Offered in 1987)**

The nature and behavior of cell inclusions in relation to heredity. P, Bio 341 or 371.

**576-676 Livestock Insect Pest Management 3 AY F (Offered in 1987)**

Encompasses the various methods used for suppression of insects and related arthropod pests of livestock and poultry. Information is included on the biology, identification and ecology of the pests, economic injury levels. A synopsis of livestock diseases transmitted by insects or other arthropod pests is included.

**581-681 Crop Breeding Techniques 1(1,0) AY Su (Offered in 1988)**

A practicum course where 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.

**583-683 Crop-Water Relationships 2(2,0) AY F (Offered in 1987)**

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.

**593-693 Genetics of Plant Disease Resistance 2(2,0) AY S (Offered in 1988)**

Extensive study of genetic mechanisms in the host and pathogen that determine plant disease reactions and how these genetic systems interact; breeding plants for disease resistance; discussion of current topics in host-pathogen genetics. P, 443 or AS 332, 523, Stat 641.

**598-698 Field Studies in Pedology 2 Su**

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, 310 or consent of instructor.

**599-699 Biometrical Genetics 3(3,0) AY F (Offered in 1987)**

The detailed study of the theory and application of quantitative genetics to plant and animal improvement. Experimental systems used in quantitative genetics, e.g., diallel and Carolina designs, will be discussed.

**700 Special Topics 1-6 (1-3 per credit) FSSu**

Saline-sodic soils; secondary and micronutrient management; plant and soil modeling; other topics on demand.

**780 Advanced Special Problems 1 or 2 FSSu****781 Graduate Seminar 1(1,0) FS****790 Thesis, MS. As arranged.****799 Advanced Plant Breeding 3(3,0) AY F (Offered in 1988)**

Topics discussed will be heterosis, path analysis, and physiologic breeding of both cross and self-pollinated species. Classical research papers dealing with plant breeding will be read. P, 443 or AS 332, Bio 371, Stat 641.

**890 Thesis, Ph.D. As arranged.**

## Political Science (PoS)

### College of Arts and Science

Professor Cheever, head; Professors Burns, Hendrickson, Tolle; Associate Professor Schwab

Political science courses are designed to achieve the following objectives; provide the broad knowledge and engender the critical attitudes essential in a democratic society; serve the other social sciences as a cognate field; offer a comprehensive program for the major student.

Those who choose to major in political science will be preparing for a career in public affairs, the law, business, or teaching. Academic advisers will assist in planning a program suited to objectives whether it be graduate school, law school, secondary teaching, government work, or related employment. Courses in history, economics, sociology, geography, and psychology are important for an understanding of the origins and operation of political institutions, and will constitute an integral part of the student's curriculum.

#### Political Science Major

Political science majors may work toward either a Bachelor of Arts or Bachelor of Science degree. All are required to take 33 hours in political science including PoS 100 or 101 and at least 21 upper division credits (above 300). PoS 210 is required for all majors who take the Education Block (see below). Finally, 6 hours in Political Science comparative government and/or international courses, either upper division or lower division, are required. You are encouraged to select at least one upper division course in each of the following fields within the major: American Government and Politics, Public Administration, Public Law, Comparative Government, and International Relations or Political Theory. Students must meet the university and Arts and Science College requirements.

Depending on career plans, you may want to consider taking courses in composition, business and economics, sociology, public relations, and computer science.

#### Teaching Option

If you are preparing to teach secondary school, take education block prerequisite courses in the sophomore and junior years. You must consult with the Dean of the Education Division prior to your junior year. Set aside one semester for the education block and off-campus teaching assignment during your senior year. Students in this option should select an appropriate minor or minors.

#### Pre-law Option

Law schools require a bachelor's degree for entrance. Although a particular major is not specified, Political Science is a common choice because of its flexibility. Pre-law students are carefully counseled by the Political Science staff to insure the appropriate background for the study of law.

#### Public Administration Option

Students interested in working in government at the local, state, or national level should plan to take several courses related to public administration and American politics. Students are encouraged to take the practicum or an internship with a government agency.

#### Criminal Justice Option

Only Political Science and Sociology majors may minor in criminal justice on the SDSU campus. The program is in cooperation with USD. Consult advisers for minor requirements.

## General Political Science Option

You may choose to take a very flexible program in Political Science. Such a program might be designed to lead to graduate work in Political Science, or employment in business, journalism, planning, or the international area.

## Double Major Option

You may combine a major in Political Science with nearly any other major. While students must ordinarily select courses with care in order to meet requirements in two fields, most can finish the double major in four years.

## Curriculum in Arts and Science, Political Science Major

Leading to the Bachelor of Arts degree

In addition to the departmental requirements, you must meet all university and Arts and Science College requirements.

During the freshman year you will take English, foreign language, American Government, Fundamentals of Speech, natural science or mathematics and physical education. In addition, there may be openings for some electives. In the sophomore year the foreign language requirements will be completed and further 200 level courses in political science chosen. In addition, the introductory courses in such fields as history, sociology, geography, psychology and economics should be taken to prepare for advanced courses in those areas that are related to the student's interests. The junior and senior years are open for completion of humanities and English requirements and for development of the major, supporting social science courses, and other advanced courses (e.g., the education block).

## Curriculum in Arts and Science, Political Science Major

Leading to the Bachelor of Science degree

In addition to the departmental requirements, you must meet all university and Arts and Science College requirements.

In addition, a major will be required to take three additional credits in the humanities area (for a total of 12 credits in humanities). It is also strongly recommended that majors take courses in Statistics and Computer Programming.

During the freshman year the major will take English, Fundamentals of Speech, American Government, two semesters of biological or physical science, physical education and mathematics. In addition there will be openings for some electives. In the sophomore year the biological and physical science requirements will be completed and further 200 level courses in political science chosen. In addition, introductory courses in humanities and other social sciences (history, sociology, geography, psychology and economics) should be taken to prepare for advanced courses in those areas that are related to the student's interests. The junior and senior years are open for completion of humanities and English requirements and for development of the major, supporting social science courses, and other advanced courses (e.g., the education block).

**Minors:** 18 hours will constitute a minor. PoS 100 or 101 is required in addition to 9 hours of upper division (over 300) credits. You may opt for a minor with a concentration in public law, public administration, or the international area by carefully choosing your courses.

## Undergraduate Courses

### 100 American Government 3(3,0) FSSu

Origins, development and operation of American government at the national level. Concentration on political institutions. (Credit not allowed for both 100 and 101.)

### 101 American Government Honors 3(3,0) F

Small group discussion of principles of American government for students with superior high school background. By invitation (credit not allowed for both 100 and 101.)

### 102 American Political Issues 3(3,0) FS

Current major issues in American politics, governmental policies and various alternatives being considered in Congress.

### 210 State & Local Government 3(3,0) FS

Legal status, forms and functions, interrelationships, current trends and suggested reforms.

### 253 Current World Problems 3(3,0)

Political characteristics of major world regions, problems and interrelationships.

### 265 Political Ideologies 3(3,0)

Concepts of political science; comparative governmental structure, theories of the state, and modern ideologies.

### 301 Political Parties 3(3,0)

U.S. Political parties; functions, organization, techniques and significance of parties; varieties of state and local systems; and behavior of the electorate and interest groups.

### 315 South Dakota Government & Politics 3(3,0)

Political culture; State Constitution; Governmental structure and administration; Parties and Elections; Interest Groups; Public Policy; Intergovernmental Relations; Reform. No prerequisites.

### 320 Public Administration 3(3,0) FS

U.S. public administration; basic elements of administration: personnel, budgeting, planning, organization and management; and importance of federal executives in shaping public policy. P, 100 (or 101) or consent.

### 330 Constitutional Law 3(3,0) F

Structure and jurisdiction of federal judiciary. Legal basis of American federalism. Constitutional powers of American Presidency, U.S. Congress and state governments as interpreted through U.S. Supreme Court decisions. Reasoning of the Court and evolutionary nature of American constitutional law. P, 100 (or 101) or consent.

### 331 Civil Rights & Liberties 3(3,0) S

Individual First Amendment guarantees, constitutional rights of the accused in the criminal process and equal protection of the law as interpreted through U.S. Supreme Court decisions. P, 100 (or 101) or consent.

### 332 Administrative Law 3(3,0)

Meaning and historical development of administrative law, legislative and judicial controls, the administrative process and remedies against improper administrative acts.

### 341 European Democratic Governments 3(3,0)

Comparative study of selected governments of West Europe, especially Britain, France, Germany and Italy; decision-making institutions; political culture; political parties.

### 343 The U.S.S.R. 3(3,0)

Study of government, politics, and some aspects of society in the Soviet Union.

### 345 Canada 3(3,0)

Political institutions and patterns; The Constitution and federalism; Quebec and Canada; U.S. — Canadian relations.

### 347 Latin American Politics 3(3,0)

Society and political culture; political institutions; patterns of change; development strategies and policies. Comparative analysis of 4-7 countries chosen from both South and Central America.

### 351 International Politics 3(3,0)

How nation-states behave and why they behave as they do in their relations with each other.

### 356 International Law & Organization 3(3,0)

System of rules purporting to regulate conduct of nation-states and development of machinery of international cooperation with particular reference to United Nations.

### 371 Contemporary Culture & Politics 3(3,0)

Public opinion and the interrelation between culture and politics. Uses scientific survey data, social and political theory, contemporary history humanists, cultural criticism.

### 392 Political Science as a Discipline 1(1,0)

Survey of the discipline of Political Science, of the sources of research data, and of potential careers for Political Science graduates.

### 401 The American Presidency 3(3,0)

The Presidency in the American political system, its powers and limitations, and the role individual presidents have played in its development in the 20th century. P, 100 (or 101) or consent.

### 402 The Legislative Process 3(3,0)

Congress and state legislatures: functions, organization, leadership, procedures, and participants. Influence of chief executives, bureaucracies, interest groups, and political parties. P, 100 (or 101) or 210 or consent.

### 408 Municipal Government & Administration 3(3,0)

Governmental and administrative problems of municipalities with particular reference to SD. P, 100 (or 101) or consent.

### 428 Personnel & Budgetary Administration 3(3,0)

Contemporary personnel and budgetary systems at federal and state government levels. Role of the civil servant in government and society, and the political and technological factors which influence the budget. P, 100 or 101.

#### 446 China & Asian Politics 3(3,0)

Historical factors and events contributing to present governmental structures, ideologies, and political issues in the area. Includes China, Japan, Southeast Asia, India, and Pakistan.

#### 448 Politics of Middle East & Africa 3(3,0) S

Politics, government and international relations of Israel and selected Arab and African nation-states.

#### 461 Political Philosophy 3(3,0)

Types of political theory in historical development. Bases on which these theories rest and the explanatory power of the various thought structures. Includes Plato, Aristotle, Machiavelli, St. Thomas, Various and Hobbes. (Cross-listed as Phil 423.) A.Y.

#### 462 Modern Political Theory 3(3,0)

Same approach as 461. Major political theorists from Hobbes to the present, including Locke, Rousseau, Mill, Marx and others. (Cross-listed as Phil. 424.) A.Y.

#### 483 Directed Studies 1-9

See description under Undergraduate Course Specials in the Alternatives and Options for the College of Arts and Sciences.

#### 490 Seminar in Political Science 1-2-3(1-2-3,0)

Selected Political Science fields. May be repeated until 6 credits are earned.

#### 493 Undergraduate Course Specials 1-5

See description under Undergraduate Course Specials in the Alternatives and Options for the College of Arts and Science.

#### 494-495-496 Cooperative Education/Internship/Field Experience (Topical) 3-12 FSSu

Approximately one credit for each week spent in cooperative education or internship projects off-campus. Written reports and/or a final oral examination will be required. Application for permission to register must be made prior to registration. Non-Political Science majors must show appropriate background. Credits do not count toward meeting the minimum requirements in the major or minor. May be repeated until 12 credits are earned. Graded E or F.

## Graduate Courses

Consent required of those students not majoring or minoring in Political Science.

#### 560-660 Topics in Political Science 2-4

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.

#### 592-692 Special Problems 1-2-3(1-2-3,0) FSSu

Individual guided research culminating in formal research paper. May be repeated until 6 credits are earned.

## Printing (Prtg)

### (See Journalism and Mass Communication)

## Psychology (Psyc)

### College of Arts and Science

Professor Branum, Head; Professors Burke, Hillner, Ritter

The Department offers preprofessional and applied curricula in the Psychology major and also offers a Psychological Services major. Each curriculum requires certain core courses but they differ otherwise according to the goals of the student.

#### Psychology Major, Preprofessional Curriculum (BA or BS)

Those who intend to become qualified psychologists should elect the preprofessional curriculum, designed to prepare for training at the graduate level. This requires a strong foundation in techniques of analyzing behavior, historical findings and theoretical approaches, as well as a basic understanding of supporting fields. The curriculum for this major is as follows:

102, Introduction to Psychology, 4 cr.; (transfers may substitute 101, General Psychology, 3 cr.); 202, Advanced General Psychology, 3 cr.; 302, Psychological Investigations, 3 cr.; 303, Experiments in Psychology, 3 cr.; 305, Simple Learning and Conditioning, 3 cr.; 306, Human Learning and Cognitive Behavior, 3 cr.; 311, Physiological Psychology; 362, Theories of Personality, 3 cr.; 401, Psychology Seminar, 1 cr.; 409, History and Systems of Psychology, 3 cr.; 451, Abnormal Behavior, 3 cr.; Stat 341, Statistical Methods I, 3 cr. (recommended elective); 492, Problems in Psychology, 3 cr.

For the college and university requirements see the appropriate sections of the catalog.

#### Psychology Major, Applied Curriculum (BA or BS)

The curriculum in Applied Psychology is intended primarily for those who desire, before or apart from any consideration of graduate training, a useful knowledge of principles of behavior that might apply to any occupation that requires working with people.

The curriculum for this major is as follows:

102, Introduction to Psychology, 4 cr.; (transfers into the Psychology major may substitute 101, General Psychology, 3 cr.); 401, Psychology Seminar, 1 cr.; 492, Problems in Psychology, 3 cr.; Psychology electives appropriate to the area of interest, 16 (or 17) cr.; for a total of 24 credits in Psychology.

For college and university requirements see the appropriate sections of the catalog.

#### Psychological Services Major (BA or BS)

Persons interested in working as diagnostic and therapeutic aides in clinical facilities should elect the Psychological Services major. This includes familiarization with standard tests and techniques of therapy, as well as a supervised senior practicum at a treatment facility. The curriculum for this major is as follows:

102, Introduction to Psychology, 4 cr.; (transfers into the major may substitute 101, General Psychology, 3 cr.); 302, Psychological Investigations, 3 cr.; 303, Experiments in Psychology, 3 cr.; 305, Simple Learning and Conditioning, 3 cr.; 311, Physiological Psychology, 3 cr.; 321, Child Psychology, 3 cr.; 356, Psychological Assessment, 2 cr.; 357, Psychological Therapies, 2 cr.; 358, Behavior Modification, 3 cr.; 362, Theories of Personality, 3 cr.; 401, Psychology Seminar, 1 cr.; 441, Social Psychology, 3 cr.; Psychology of Abnormal Behavior, 3 cr.; 497, Practicum for Psychology Technicians, 12 cr.; 492, Problems in Psychology, 3 cr.

Although not a formal requirement, students will benefit by taking 305 before 306 and 362 before 357. Practice testing is recommended to fulfill the 492 requirement.

For other college and university requirements see the appropriate sections of the catalog.

#### Teaching Option

Students considering teaching secondary school should notify the Department Teaching Coordinator and the Division of Education before their junior year. Coursework should include the preprofessional psychology curriculum along with 321, child psychology and 441, social psychology. As a prerequisite for student teaching, SeEd 412 should be taken no later than spring semester of the junior year. One semester of the senior year will be set aside for the education block and off-campus teaching.

#### Minor

The minor in Psychology consists of the following courses: 101 or 102, 202, 409, and 6 or 7 credits of 300-400 level courses for a total requirement of 16 credits.

## Undergraduate Courses

#### 101 General Psychology 3(3,0) FSSu

Concepts of development, learning, motivation, emotion, frustration, personality, and other basic behavioral processes. Prerequisite for all courses in psychology except 102.

**102 Introduction to Psychology 4(4,0) F**

Fundamentals of behavior, including maturation, physiological processes, sensation and perception, learning, motivation, emotion and frustration, personality, abnormal processes, and methods of investigation. P, major or minor in psychology or consent of instructor. Prerequisite for all courses in psychology taken by majors except transfers who have taken Psyc 101. Note: credits will not be given for both Psyc 101 and 102.

**202 Advanced General Psychology 3(3,0) FSSu**

Contemporary research related to psychological concepts expounded in Psyc 101 and 102. P, 101 or 102.

**302 Psychological Investigations 3(3,0) F**

Methods of investigating human and animal behaviors. P, 101 or 102.

**303 Experiments in Psychology 3(3,0) S**

Review of representative past research in experimental psychology and execution of class laboratory projects. P, 302 or consent.

**305 Simple Learning & Conditioning 3(3,0) F**

Traditional conditioning experimentation and phenomena, primarily as revealed through animal research. Principles of reinforcement and factors which influence the conditioning process are discussed in detail. P, 101 or 102.

**306 Human Learning & Cognitive Behavior 3(3,0) S**

Traditional human learning experimentation and human cognitive behavior such as perceptual-motor skills, verbal learning and behavior, transfer of training, concept formation, memory, natural language behavior, information processing, etc. P, 101 or 102.

**311 Physiological Psychology 3(3,0) F**

Role of physiological mechanisms in behavior. Nervous, biochemical and muscular systems that control or modify human and animal adjustment. P, 101 or 102.

**321 Child Psychology 3(3,0) SSu**

Physical, social, emotional and intellectual aspects of child development. May be counted as an education elective. P, 101 or 102.

**331 Business & Industrial Psychology 3(3,0) F**

Application of psychological principles to such problems as employee selection, supervision, job satisfaction, work efficiency and human engineering. P, 101 or 102.

**356 Psychological Assessment 2(2,0) F**

Diagnosis and classification by interview and observation techniques, and by intellectual achievement and aptitude, temperament and personality tests. Familiarization at the level of the professional assistant. P, 101 or 102.

**357 Psychological Therapies 2(2,0) S**

Traditional and contemporary methods of psychotherapy. Interviewing techniques and the professional assistant's role. P, 101 or 102.

**358 Behavior Modification 3(3,0) S**

Principles of learning applied to human behavior modification. P, 101 or 102.

**362 Theories of Personality 3(3,0) S**

Major personality theories, including psychoanalytic, stimulus-response and constitutional formulations. P, 101 or 102.

**401 Psychology Seminar 1(1,0) F**

Current employment trends and developments within the profession. Required of all majors. P, senior standing or consent.

**409 History & Systems of Psychology 3(3,0) S**

Origins and channels of psychological thought, from the British empiricists through major contemporary developments. P, 101 or 102.

**441 Social Psychology 3(3,0) F**

Basic principles, concepts and methods utilized in analyzing individual and group interactions. P, 101 or 102.

**451 Abnormal Behavior 3(3,0) FSSu**

Causative factors, symptoms and treatment of major forms of abnormal behavior, including neurosis, psychosis and the psychophysiological disorders. P, 101 or 102.

**492 Problems in Psychology 1-3 FSSu**

Independent investigations. May be repeated for a total of 6 credits. P, 101 or 102, consent of a supervising staff member.

**493 Undergraduate Course Specials 1-5**

See description under Undergraduate Course Specials in the Alternatives and Options for the College of Arts and Science.

**494-495-496 Cooperative Education/Internship/Field Experience (Topical) 3-12 FSSu**

See description in the Alternatives and Options for the College of Arts and Science. Will not count toward minimum credit requirements in the major.

**497 Practicum for Psychology Technicians 12(0,12) FSSu**

Supervised training and experience at an institution for behavior disorders or mental deficiency. Primarily for majors in the Psychological Services curriculum. P, minimum GPA of 2.2, consent of program coordinator and approval of institutional supervisor. Will not count toward minimum credit requirements in the major.

## Religion (Rel)

(See Philosophy and Religion)

## Reserve Officer Training Program

(See Aerospace Studies, Military Science)

## Sociology (Soc)

(See Rural Sociology)

## Rural Sociology (Soc) (Anth)

### College of Agriculture and Biological Sciences

Professor Satterlee, head; Professors Hess, Kayongo-Male, Wagner; Professors Emeriti Chittick, Dimit, Sauer; Associate Professors Faltemier, Mendelsohn; Assistant Professors Baer, Stover, Grant.

The courses offered by the department have been organized with three definite objectives in mind; a sequence for those in Agriculture and Biological Sciences, Arts and Science or other colleges who may wish to earn an undergraduate major or minor in sociology; basic service courses that will be of interest and practical help to students in any college; courses to fulfill requirements of a Master's degree or Doctor of Philosophy degree in Sociology.

An undergraduate may select from any of the following options as an area of concentration.

#### Options

**Introduction:** The department advising program is designed to provide the major with several options based upon career interest. Each major is assigned to an adviser based on choice of option. Upon determination of career interest you may select a specialized option. Majors will be furnished with a department undergraduate handbook outlining specific requirements and recommended courses in each option.

1. **General Sociology Option.** All incoming freshmen and transfer student majors will be assigned to this option. After taking courses in specialized areas, and working with General Sociology Option Advisers, students may select any of the following options. Those desiring to gain a broad orientation to all areas of Sociology with anticipation of other career interests or graduate school may remain in this option.

2. **Teaching Option.** Prepares for entrance into junior or senior high level teaching. These students in consultation with departmental Teaching Option Adviser and the Division of Education plan their program to accomplish other teaching minors to maximize employment opportunities. One semester is set aside for a teaching-block and off-campus teaching assignment.

3. **Social Work Option.** The department cooperates with the Department of Social Behavior at USD, to offer an accredited degree in Social Work for those seeking a specialized career in private or public social welfare. Students need to work closely with their adviser and the Coordinator of Social Work. They need to select this option

early in their sophomore year to complete all requirements. The final portion of the program is completed at USD. Students seeking more general social service type careers should select the Human Services Option.

**4. Human Services Option.** Designed for those interested in "working with people" in a variety of social service type agencies. Students are encouraged to take social work, law enforcement, and child development type courses and spend time in field placement in a social service agency. This option differs from the Social Work Option in that students are working toward a BA or BS degree in Sociology; whereas those in the Social Work Option are seeking a BA or BS in Social Work.

**5. Criminal Justice Option.** Students seeking careers in probation, parole, court services, pre-law, private security, or general law enforcement should select this option. Those selecting this option will be working toward a BA or BS in Sociology with a minor in Criminal Justice, both offered by the Department of Sociology in cooperation with the Department of Criminal Justice at USD. Students will be expected to work closely with their adviser and the Coordinator of Criminal Justice within the department to fulfill the necessary requirements of the program.

**6. Personnel Services Option.** Those students seeking careers in business, related to personnel relations in public and private agencies and businesses, are encouraged to select this option. Basic training in employee relations, conflict management, labor relations, aptitude testing, Affirmative Action requirements are a part of this program. Supportive coursework in economics, guidance, accounting and psychology are incorporated in this option.

**Curriculum in Arts and Science, Sociology Major**  
Leading to the Bachelor of Arts degree

	Credits
Fr Comp, Engl 101 .....	3
Jr Comp, Engl 300.....	3
Fund of Speech, SpCm 101 .....	3
Fitness & Lifetime Activities PE 100 (two semesters).....	2
Foreign Languages (8-14 hours determined by proficiency test).....	14
Humanities (from approved list) .....	6
Mathematics (any Math course).....	3
Natural Science (From approved list. At least 6 credits of sequential courses are required.).....	8
Social Science electives (outside major dept. see approved list)..	6
Major in Sociology .....	32
Include Soc 100, 301, 310, and 23 additional elective Sociology or Anthropology credits to include one of the following: Soc 150, 240, 250, 340, or any Anth. course.	
General electives .....	48
Majors need to consult with their adviser for recommended electives to best fit their option (General Sociology, Teaching, Social Work, Human Services, Criminal Justice, Personnel Services) within the major.	
<b>Total Hours</b>	<b>128</b>

Students should plan their schedules to take lower level courses (100-200) in their Freshman and Sophomore years and upper level (300-400) during their Junior and Senior years. Students must accomplish a total of 40 hours of upper level courses (300 or above).

**Minor**..... 17  
(Include Soc 100, and 14 additional credits. Six credits must be numbered 300 or above.)

**Curriculum in Arts and Science, Sociology Major**  
Leading to the Bachelor of Science degree

	Credits
Fr Comp, Engl 101 .....	3
Jr Comp, Engl 300.....	3
Fund of Speech, SpCm 101 .....	3
Fitness & Lifetime Activities PE 100 (two semesters).....	2
Humanities (from approved list) .....	9
Mathematics (any Math course).....	3
Natural Science (from approved list. Select 6 credits of sequential courses)	6

Physical Science electives .....	8
Biological Science electives .....	6
Social Science electives (outside major dept. See approved list).....	6
Major in Sociology .....	32
Include Soc 100, 301, 310, and 23 additional elective Sociology or Anthropology credits to include one of the following: Soc 150, 240, 250, 340, or any Anth. course.	
General electives .....	53
Majors need to consult with their adviser for recommended electives to best fit their option (General Sociology, Teaching, Social Work, Human Services, Criminal Justice, Personnel Services) within the major.	
<b>Total Hours</b>	<b>128</b>

Students should plan their schedules to take lower level courses (100-200) in their Freshman and Sophomore years and upper level (300-400) during their Junior and Senior years. Students must accomplish a total of 40 hours of upper level courses (300 and above).

**Minor**..... 17  
(Include Soc 100, and additional 14 credits. Six credits must be numbered 300 or above.)

**Curriculum in Agriculture, Rural Sociology Major**  
Leading to the Bachelor of Science degree

	Credits
Fr Comp, Engl 101 .....	3
Junior Composition, Engl 300.....	3
Fund of Speech, SpCm 101 .....	3
Macroeconomics Principles, Econ 201 .....	3
Fitness & Lifetime Activities, PE 100 (two semesters).....	2
General Chemistry, Chem 110 or 112.....	4
Algebra, Math 111 or 113.....	3-5
Intro Physics, Phys 101, 111 or 112 .....	4
Communication Elective. (To be selected from Engl 303 MCom 210, 313, 315, 330, 331, 335, SpCm 315, 334, 335) ....	2
Group I Agriculture Courses (See catalog listing).....	12
Humanities electives (See catalog listing).....	6
Biological Science, Biol 151-153 .....	6
<b>Major in Sociology</b> .....	<b>32</b>
(Same as BA in Arts and Science)	
General electives. Majors need to consult their adviser for recommended electives to best fit career aspirations.....	45
<b>Total Hours</b>	<b>128</b>

Students should plan their schedules to take lower level courses (100-200) in their Freshman and Sophomore years and upper level (300-400) during their Junior and Senior years.

**Minor in Sociology**..... 17  
(Same as BA or BS in Arts and Science)

The courses in Rural Sociology are listed under two sections: Anthropology (Anth) and Sociology (Soc).

## Anthropology (Anth)

### Undergraduate Courses

- 200 General Anthropology 3(3,0) F**  
Physical anthropology, archaeology and linguistics, analysis of concepts of society and culture. Emphasis on nonliterate peoples of the world.
- 320 Cultural Anthropology 3(3,0) S**  
Meaning of culture, its significance for humans, its diverse forms among peoples, past and present.
- 321 High Cultures of Central & South America 3(3,0) (On Demand)**  
A cultural survey of the Aztec, Maya and Inca Indian civilizations. Factors and processes of growth that shaped cultural history in Mexico, Guatemala and Peru, before the advent of the whiteman.
- 421 Indians of North America 3(3,0) FSSu**  
Provides prospective teachers and those interested in Indian people with a basic knowledge of Indian heritage and culture. Emphasis on the Dakota Indians.

**494-495-496 Cooperative Education/Internship/Field Experience in Anthropology 1-12 FSSu**

Planned and supervised professional experience related to Anthropology which takes place outside the formal classroom with business, industry, private/public agencies. Credit will not count toward meeting minimum requirements of the major or minor. May be repeated until 12 credits are earned. Graded S or U; P, major or minor; P, consent of department program coordinator.

## Graduate Courses

**590-690 Special Problems 1-2 FSSu**

P, open to undergraduate and graduate students with sufficient background and consent of instructor.

**791 Seminar 1-4 FSSu (On demand)**

## Sociology (Soc)

### Undergraduate Courses

**100 Introduction to Sociology 3(3,0) FSSu**

Comprehensive study of society, with analysis of group life, and other forces shaping human behavior.

**150 Social Problems 2(2,0) FS**

Present day problems in American society, such as crime, divorce, alcoholism, drug addiction, old age, physical and mental health — their significance and current methods of prevention and treatment.

**240 Rural Sociology 3(3,0) FS**

Rural society, rural communities, population composition and trends, social processes; social participation in rural organizations and agencies; and changing relationship between country and city in contemporary society.

**250 Marriage 2(2,0) FS**

Courtship and marriage period given special emphasis. Mate selection problems, adjustments in marriage, reproduction, child-parent relations, divorce, and later years of marriage.

**270 Introduction to Social Work 3(3,0) FS**

History of social work methods, social services to children, family, aged, public welfare clients, mentally ill, criminals, school and the community.

**301 Intermediate Sociology 3(3,0) FS**

Advanced principles of sociology: development of a sociological perspective, conceptual framework and elements of sociological theory and analysis. P, 100.

**310 Introduction to Research Methods 3(2,2) FS**

The research process; selection and formulation of research problems; concepts, propositions and scientific theories; elementary research design; data collection procedures, elementary statistical interpretations and conclusions. P, Soc 100.

**330 Self and Society 3(3,0) F**

Focus of attention on the nature of social interaction and the dynamic social activities taking place. Includes examination of self-concept, self-attitudes as well as the perception and interpretation of others. P, 100.

**340 Urban Sociology 3(3,0) S**

Patterns of urban growth, demographic and ecological processes, institutions, folkways, dynamics of social class, and social problems of modern city and urban fringe areas.

**350 Ethnic and Racial Groups 3(3,0)F**

Intergroup relations. Particular focus on ethnic and racial groups in the U.S. and Upper Midwest. Cross-Cultural Comparisons.

**351 Criminology 3(3,0) S**

Nature and causes of crime. Theories of punishment. Agencies and methods of arrest, conviction, and segregation of criminals. Jails, prisons and reformatories. Probation and parole.

**353 Sociology of Work 2(2,0) F.**

Focus on human behavior in work environments. Topics include social organization of work; managing human resources; management — labor relations; role of pay and benefits; problems of personnel adjustment; and work related social tensions and conflict.

**362 Population Problems 3(3,0) S**

Theories of population: factors involved in birth rate, death rate, and migrations. Social consequences of population change; problems of population composition and population policy.

**370 Social Policy 3(3,0) F**

Historical development of social welfare legislation; current trends and issues in, and implementation and administration of social policy.

**382 The Family 3(3,0) S**

Development of the family as a social institution with emphasis on comparative family systems and the contemporary American family from the standpoint of social class, ethnic background and family crises.

**383 Sociology of Sex Roles 3(3,0)**

Female and male roles in relation to one another in a changing world are the focus of this course. The nature of sex roles, their origin, and their variations over time and across cultures are examined.

**451 Juvenile Delinquency 3(3,0) F**

Causes of delinquency; patterns of delinquent behavior; Juvenile and alternative solutions currently in operation throughout the US which attempt to reduce the incidence of juvenile delinquency.

**471 Social Work Skills & Methods I 3(3,0) S**

Basic concepts and methods common to all social service practice; focus on developing interactional skills. (P, 270, to be taken prior to internship).

**490 Special Problems 1-2 FSSu**

P, major or minor and junior or senior standing and consent of instructor.

**491 Seminar 1-3(1,0) FSSu (on demand)**

Focus will vary in areas of sociology, anthropology, teaching and research, and by option. Can be repeated. P, Soc 100.

**494-495-496 Cooperative Education/Internship/Field Experience in Sociology 1-12 FSSu**

Planned and supervised professional experience related to Sociology which takes place outside the formal classroom with business, industry, private/public agencies. Credit will not count toward meeting minimum requirements of the major or minor. May be repeated until 12 credits are earned. Graded S or U; P, major or minor; P, consent of department program coordinator.

**497 Topics in Sociology 1-3 FS (on demand)**

Selected topics of current interest in Sociology. Subject areas vary from semester to semester based on general interest appeal.

### Graduate Courses

(see department for schedule of offerings)

**501/601 Social Deviance 3(3,0)**

This course will examine the nature of negatively evaluated behaviors and the process by which customs, rules and normative structure of society are constructed. A primary goal of the course is the development of a coherent interpretation of contemporary theories and empirical investigations of social deviance. P, undergraduate or graduate.

**515-615 Social Thought 3(3,0)**

Brief survey of history and development of world's most important social theories and schools of social thought, evaluated in light of present knowledge. P, undergraduate or graduate.

**520-620 Social Organization 3(3,0)**

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, undergraduate or graduate.

**521-621 Social Stratification 3(3,0)**

Theories of social stratification. Relationship between social class and education, occupational choice, political preference, religious affiliation and social mobility. P, undergraduate or graduate.

**530-630 Social Change 3(3,0)**

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, undergraduate or graduate.

**533-633 Leadership & Group Organization 3(3,0)**

Emergence of and types of leaders. Emphasis on group dynamics, small groups and approaches to management. P, undergraduate or graduate.

**540-640 Rural Community Planning 3(3,0)**

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, undergraduate or graduate.

**710 Research Methods 3(3,0) S**

**712 Sociological Theory I 3(3,0) F**

**713 Sociological Theory II 3(3,0) S**

**760 Advanced Demography 3(3,0)**

**780 Special Problems 1-3(1-3,0) FS**

**781 Internship in Planning 1-6 FS**

**790 Thesis, M.S. as arranged**

**791 Seminars 1-4 (On demand) FSSu**

**793 Research Paper in Sociology 1-3 (As arranged)**

**890 Thesis, Ph.D. as arranged**

# Sociology (Soc)

(See Rural Sociology)

# Soils

(See Plant Science)

# Speech (Sp)

## College of Arts and Science

Professor Zivanovic, Head; Professor Emeritus Stine; Professors Denton, Ferguson, Hoogestraat, Johnson, Meyer, Widvey; Associate Professor Schliessmann; Assistant Professors Hefling, Lampson, Peterson; Instructors Jorgenson, Wheeler.

You may major or minor in speech, elect courses for self improvement, take courses to meet humanities requirements, or participate in speech activities. The major may choose any of the following options: Option A — General Speech (Balanced curriculum); Option B — Theatre; Option C — Speech Communication; Option D — Mass Communication; Option E — Communication Disorders; Option F — Speech Education.

### Advanced Placement in Speech

All students are required to take Speech (SpCm) 101 for graduation; however, those with previous training and experience in speech may apply to the department to take an advanced course or courses in Speech and earn credit for 101 concurrently. The disposition of the application for advanced placement rests with the departmental administrator. Application must be made by the end of the third semester or prior to the fourth semester of residence.

### Co-curricular Activities

#### Theatre

Professor Johnson, Director of Theatre

Several major, experimental and student productions each year. You may be cast in or assist with a production. University credit may be earned.

#### Forensics

Professor Hefling, Director of Forensics

Local, regional and national participation in debate, extempore speaking, oral interpretation, and oratory is sponsored. Any student is eligible. University credit may be earned.

#### Radio, Television, and Film

Opportunities are provided to perform and assist in production in broadcast facilities. University credit may be earned.

#### Speech and Hearing Clinics

Professor Meyer, supervisor

Clinical speech and hearing services are available to students under the supervision of American Speech and Hearing Association certified clinicians.

### Curricular Program

**Major:** 36 credits in Speech, including SpCm 101, approved by the department. Not more than 13 credits chosen from the activity courses (MCom 132, SpCm 281, Thea 135, 145, 195 and 495) may be counted toward the major.

**Minor:** 20 semester credits (including SpCm 101) approved by the head of the department. Not more than 8 credits chosen from activity courses (MCom 132, SpCm 281, Thea 135, 145, 195 and 495) may be counted.

### Upper Level Requirements

See College of Arts and Sciences requirements.

### Option A General Speech (Balanced Curriculum)

Curriculum in Arts and Science, Speech Major  
Leading to the Bachelor of Arts degree

	Credits
Fr Comp, Engl 101; Jr Comp Engl 300 .....	6
Fund of Speech, SpCm 101 .....	3
Fitness & Lifetime Activities, PE 100.....	2
Mathematics.....	3
Natural Science (2 prefixes).....	8
Social Science.....	12
Humanities (From 2 disciplines other than Speech and Foreign Languages.) .....	6
Foreign Language.....	14
Major (in addition to SpCm 101) .....	33
Electives (including 23 credits for prospective teachers) .....	41
<b>Total</b>	<b>128</b>

### Curriculum in Arts and Science, Speech Major

Leading to the Bachelor of Science degree

	Credits
Fr Comp, Engl 101; Jr Comp, Engl 300 .....	6
Fund of Speech, SpCm 101 .....	3
Fitness & Lifetime Activities, PE 100.....	2
Mathematics.....	3
Biological Science.....	6
Physical Science .....	8
Social Science.....	12
Humanities (From 2 disciplines other than speech).....	9
Major (in addition to SpCm 101) .....	33
Electives (including 23 credits for prospective teachers) .....	46
<b>Total</b>	<b>128</b>

### Option B — Theatre

Students seeking Option B, **Theatre**, should complete their major as follows: Thea 100, 131, 141, 351, five credits selected from Thea 495, 135, 145; SpCm 101, 330 or 442; three credits selected from Thea 510 or 560; and ten credits of electives chosen from courses prefixed Thea.

The humanities requirement is to be fulfilled by selecting courses from Art, Dance, Music, Dramatic Literature Classes in English.

Students seeking a minor with Theatre emphasis should complete — Thea 100, 131, 141, 351 or 590; five credits chosen from Thea 495, 135, 145; SpCom 101 and sufficient electives chosen from courses prefixed Thea to raise the combined total to 20 credits.

### Option C — Speech Communication

Students seeking Option C, **Speech Communication**, should complete their major as follows: DCom 112, GCom 211, 223; MCom 130; SpCm 101, 315, 322, 330, 334, 335; and sufficient electives to raise the combined total to 36 credits.

### Option D — Mass Communication

Students seeking Option D, **Mass Communication** should complete their major as follows: MCom 130, 331, 330, 260, 333, 336, 361, 335, 372, 332, and four credits of 132, SpCm 101 and sufficient electives to raise the combined total to 36 credits.

### Option E — Communication Disorders

Students seeking Option E, **Communication Disorders**, should consult Dr. Meyer to plan a program leading to certification.

Prospective public school speech therapists should consult the state department of education in the state or states where they wish to practice. Certification for SD Public School Therapists is granted by the Department of Education, Pierre.

### Option F — Speech Education

Students seeking Option F, **Speech Education**, should complete their major as follows: DCom 112 or 131; MCom 130; SpCm 101 or



if advanced placed SpCm 315; SpCm 222, 330, 375; Thea 131, 141, 351 or 355; sufficient electives to raise the combined total to 36 credits. Option F is required for recommendation to classroom student teaching.

A minor in English is strongly recommended.

Prospective classroom teachers must also complete the courses the Department of Education requires of all secondary school teachers. Students who plan to teach in the secondary schools should consult the dean of the Division of Education before their junior year.

## Courses Offered

The courses in the Speech Department are divided into five areas: Communication Disorders (DCom), General Communication (GCom), Mass Communication (MCom), Speech Communication (SpCm), and Theatre (Thea).

## Communication Disorders (DCom)

### Undergraduate Courses

#### 112 Voice & Articulation 3(3,0) F

Improvement in articulation, pitch, rate, volume, quality.

#### 131 Introduction to Communication Disorders 3(3,0) FS

Survey of common speech problems, their correction and prevention. Emphasis on voice and articulation problems.

#### 212 Language Development 3(3,0) F (A.Y.)

Emphasis on the acquisition and development of language, verbal and non-verbal, as children learn to communicate effectively by selecting the most appropriate communication strategies.

#### 310 Current Methods in Speech Correction 3(3,0) SSu (A.Y.)

Treatment and prevention of speech and language disorders. P, 131.

#### 321 Audiology 4(4,0) SSu (A.Y.)

Pathologies of the ear. Hearing rehabilitation. Administering and interpreting hearing tests. P, consent of instructor.

#### 330 Speech Pathology in the Schools 3(3,0) F (A.Y.)

Planning and operating public school remedial program. P, 131.

#### 336 Diagnostic Methods in Speech Disorders 3(3,0) S (A.Y.)

Diagnostic tools for Speech and Language Disorders. P, 131.

#### 341 Clinical Practice in Speech Therapy 1-2 Cr. FSSu

May be repeated for total of 6 credits. P, consent.

#### 441 Clinical Practice in Audiology 1-2 Cr. FSSu

May be repeated for a total of 4 credits. P, consent.

#### 492 Special Problems in Speech Reeducation 1-2 Cr. FSSu

May be repeated to a total of 6 credits. P, consent.

#### 493 Course Special\*

\*Refer to Arts and Science alternatives and options statements.

## General Communication (GCom)

### Undergraduate Courses

#### 211 Phonetics 3(3,0) S

International Phonetic Alphabet. Study of the sounds of American English.

#### 223 Speech Science 3(3,0) F (A.Y.)

Physical, physiological, neurological, and psychological bases of speech.

#### 491 Directed Studies\*

#### 493 Undergraduate Course Specials\*

#### 494-495-496 Cooperative Education/Internship/Field Experience

#### (Topical)\*

\* Refer to College of Arts and Science alternatives and options statement.

### Graduate Courses

#### 505-605 Theories of Communication 3(3,0)

(See Journalism section.) May count toward Speech major.

#### Ling 543-643 Development of the English Language 2(2,0)

(See English Section.) May count toward Speech major.

## Mass Communication (MCom)

### Undergraduate Courses

#### 130 Intro to Radio & TV 3(3,0) F

History, structure, regulation, and financial support; potentialities and limitations; public responsibilities, impact on society.

#### 132 Mass Communication Activities 1(0,3) FSSu

Credit earned by active participation in broadcasting and film activities. May be repeated until eight activity credits are earned. P, consent.

Section I: Radio: P, MCom 130 or MCom 152 and consent of instructor.

Section II: Television: P, MCom 331 and consent of instructor.

Section III: Film: P, MCom 361 and consent of instructor.

#### 260 Introduction to Film 3(3,0) F

Film as art; themes and inventions; films and society; introduction to the camera.

#### 330 Writing for Radio & TV (2,0) S (A.Y.)

Preparation of continuities such as commercials, public service announcements, talks, interviews, drama, documentaries, and educational programs.

#### 331 Television Production 3(2,3) F

Experience in the production and direction of television programs. Includes preparation and presentation of talks, interviews, discussion, extension and community services for TV broadcast.

#### 332 Television News Reporting 3 F\*\*

#### 333 Radio News Reporting 3 F\*\*

#### 335 Broadcast Programming 3(3,0) S (A.Y.)

Program types and essentials of effective structure. Audience characteristics and preferences. Managerial problems. Special consideration of agricultural, commercial, and educational broadcast requirements.

#### 336 Radio News Lab 1-3 S\*\*

#### 361 Film Production 3(2,3) S (A.Y.)

Production methods as a tool of observation and personal expression, technique of affirmation, news — documentary, and commercial production.

#### 372 Media and Market 3(2,3) S\*\*

#### 460 Film Narrative 3(2,3) S

Myths, values and beliefs as expressed in selected films; forms, styles, and directors.

#### 493 Course Specials\*

### Graduate Courses

#### 537-637 Educational Radio & TV 3(3,0) (Offered on Demand)

Educational broadcasting with practical work in preparation and presentation of educational and instructional materials for radio, TV, and film and their use in the classroom.

#### 560-660 Special Problems in Radio, TV, or Film 1-2 cr. FSSu

Directed research. May be repeated to a total of 6 undergraduate or 4 graduate credits. P, consent.

#### 564-664 Film Studies 3(3,0) (A.Y.)

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

#### 791 Research Methods in Communications 3(3,0)\*\*

\*Refer to College of Arts and Science alternatives and options statement.

\*\* (See Journalism section.) May count toward Speech major.

## Speech Communication (SpCm)

### Undergraduate Courses

#### 101 Fundamentals of Speech 3(3,0) FSSu

Required of all students unless granted advanced placement. Emphasis on skill development in research, organization, style, delivery, and listening necessary for effective oral communication.

#### 201 Interpersonal Communication 3(3,0) FS

Current theories and practice in interpersonal communication; stress verbal and non-verbal activity.

#### 222 Debate 3(3,0) S (A.Y.)

Principles and methodology of reasoned discourse. Major emphasis: use of logic, nature of analysis and evidence in argumentative discourse.

#### 281 Forensic Activities 1(0,3) FS

Active participation in forensic activities. May be repeated for a total of 8 credits. P, consent.

### 301 Oral Technical Communication 3(3,0)

Emphasis on oral presentation of technical materials to various audiences, the technical or industrial as well as the general. P, SpCm 101, Fundamentals of Speech.

### 315 Public Speaking 3(3,0) FS

Theory and practice of public speaking, including speaking for special occasions. P, SpCm 101 or consent of instructor.

### 322 Argumentation 3(3,0) S (A.Y.)

Argumentative theory. Analytical investigation of strategies and contracts, with major emphasis on effective argumentation.

### 330 Oral Interpretation 3(3,0) FS

Oral interpretation of literature.

### 334 Discussion 2(2,0) FS

Nature, values, and limitations of discussion. Theory and practice.

### 335 Parliamentary Procedure 2(2,0) FS

Organizing and conducting meetings.

### 375 Teaching of Speech 3(3,0) F (A.Y.)

Problems of the speech teacher. Curriculum, instructional materials, and methods.

### 442 Group Performance of Literature 3(3,0) S (A.Y.)

Literary types and use in group production situations. P, SpCm 330 or consent.

### 493 Course Special\*

\*Refer to College of Arts and Science alternatives and options statement.

## Graduate Courses

### 516-616 History & Criticism of American Public Address 3(3,0) FSu (A.Y.)

Critical evaluation of American speakers from Colonial to contemporary. P, consent.

### 524-624 Persuasion 2(2,0) F (A.Y.)

Audiences, motivation, principles of attention and suggestion, bases of belief and action applicable in persuasive situations. Theory and practice. P, consent.

### 552-652 General Semantics 3(3,0) F (A.Y.)

Relations between symbols; human behavior in reaction to symbols including unconscious attitudes, linguistic assumptions; and the objective systematization of language.

### 566-666 Rhetorical Theory 3(3,0) F (A.Y.)

Historical development of rhetorical theory from classical to modern.

### 576-676 Directing Speech Activities 3(3,0) S (A.Y.)

Organizing and directing declamation, dramatic, and forensic programs.

### 592-692 Special Problems in Oral Interpretation 1-2 cr. FSSu

Directed research. May be repeated to a total of 6 undergraduate or 4 graduate credits. P, consent.

### 594-694 Special Problems in Public Address 1-2 cr. FSSu

Directed research. May be repeated to a total of 6 undergraduate or 4 graduate credits. P, consent.

### 790 Thesis 5-7 FSSu

## Theatre (Thea)

### Undergraduate Courses

#### 100 Introduction to Theatre 3(3,0) FS

Background of theatrical arts: production, plays, history, and theory.

#### 131 Acting 3(3,0) FS

Basics of acting.

#### 135 Theatre Activities — Acting 1(0,3) FSSu

Credit earned by active participation in acting roles. May be repeated for a total of 8 credits. P, consent.

#### 141 Stagecraft 3(2,3) FS

Theory and practical experience in theatre production. Lab work on two major theatre productions.

#### 145 Theatre Activities — Technical Theatre 1(0,3) FSSu

Credit earned by backstage and crew work. May be repeated for a total of 8 credits. P, consent.

#### 195 Theatre Activities — Special Projects 1(0,3) FSSu

Credit earned by completing selected theatre projects. May be repeated for a total of 8 credits. P, consent.

#### 240 Costumes for the Stage 2(2,0) S (A.Y.)

Historic, aesthetic, and functional elements of costume design.

#### 241 Make-up for the Stage 2(2,0) F

Principles and application of stage make-up.

### 341 Scene Design 3(2,3) S (A.Y.)

History of set design, planning and designing for stage. Lab work on two major theatre productions.

### 351 Directing 3(3,0) F (A.Y.)

Play directing. Theory and practice.

### 355 Children's Theatre 3(3,0) S (A.Y.)

Children's theatre as an art form. Students become proficient in organization, design, and presentation of a children's theatre program. P, Thea 131 or Thea 100.

### 395 Theatre Arts Management 3(3,0) F (A.Y.)

Emphasis on theory and practice of Arts Management as an important feature of the Theatre Arts discipline. Students will become proficient in the organization, promotion, budgeting, and operation of a performing arts program. P, Thea 100, 131.

### 445 Lighting for Stage & TV 3(2,3) F (A.Y.)

Theatre and TV lighting. Lab and production participation.

### 471 Playwriting 3(3,0) F (A.Y.)

Dramatic theory and playwriting technique in form and style; writing an original one-act. P, consent.

### 490 Summer Theatre 5(0,15) Su

Credit earned by participation in State University Theatre's repertory company. May be repeated to a total of 10 credits, but only 5 may be applied to a minor. P, consent.

### 493 Course Special\*

\*Refer to College of Arts and Science alternative and options statements.

## Graduate Courses

### 510-610 Dramatic Literature 3(3,0) S (A.Y.)

Analysis of important drama through present day.

### 560-660 History of Theatre 3(3,0) S (A.Y.)

Periods, theatres, and representative dramatic literature from primitives to present day.

### 590-690 Special Problems 1-2 cr. FSSu

Directed research. May be repeated to a total of 6 undergraduate or 4 graduate credits. P, consent.

## Statistics (Stat)

Administrative Committee: Professors Edeburn, Hsia, Kim, Lacher, Tucker; Associate Professors Ewing, Evenson, Monahan, Nielsen. Assistant Professors Ellingson, Vandever, Wicks. Teaching Faculty: Professors Hsia, Kim, Lacher; Associate Professors Evenson, Monahan, Nielsen; Assistant Professors Ellingson, Vandever, Wicks; Coordinator of Instruction: Professor Tucker.

Statistics is the development and application of the most effective methods of collecting, tabulating, and interpreting quantitative data in such a manner that the validity of conclusion and estimates may be assessed by means of inductive reasoning based on the mathematics of probability.

Statistics teaching is governed by an administrative committee appointed by and responsible to the Vice President for Academic Affairs. The statistics faculty is appointed by the Vice President for Academic Affairs from the departments involved in this area.

### Undergraduate Courses

#### 211 Survey of Statistical Applications 3(3,0) FSSu

A broad overview of the uses of descriptive and inferential statistics. Basics of frequency, central tendency and variation are presented and their applications, and misapplications, are discussed in detail. P, Math 111 or equivalent. Not a prerequisite for advanced statistics courses.

#### 341 Statistical Methods I 3(2,2) FSSu

Concepts in probability, data description, distributions, sampling, statistical inferences (parametric and non-parametric). P, Math 113 or 111. Credit will not be given for both 211 and 341.

#### Math 381 Mathematical Statistics 3(4,0) FS

Statistical methods and probability, especially in engineering and physical sciences. Common single and multiple variable densities and moment generating functions. Applications of random sampling to hypothesis testing, confidence limits, correlation, and regression. P, 224.

**Econ 423 Statistics II 3(2,2) FS**

Probability, point and interval estimation, tests of hypotheses, multiple regression and correlation, chi square analysis, and analysis of variance. P, Stat 341.

**Graduate Courses**

**541-641 Statistical Methods II 3(3,0) FS**

Analysis of variance, various types of regression and other statistical techniques and distributions. Sections offered in the areas of Biological Science, Physical Science, and Social Science. P, 341 or Math 381.

**545-645 Nonparametric Statistics 2**

Standard nonparametric methods of statistical analysis. Various methods will be compared with one another and with parametric methods where applicable. Special attention given to analogies with ordinary regression and ANOVA and an emphasis on the actual construction of tests tailored to specific problems.

**551-651 Interpretation of Statistical Software Output 1**

Interpretation of statistical software package(s).

**561-661 Experimental Design 3**

Experimental designs involving confounding will be explored as it relates to factorial experiments, incomplete block, lattice, and incomplete latin square designs. P, Stat 541-641.

**791 Special Topics in Statistics 1-3,6 max/student**

Advanced study of one or more selected topics as student need justifies such as sampling, statistical genetics, multivariate statics. P, Stat 641.

**Textiles, Clothing and Interior Design (TCID)**

**College of Home Economics**

Professor Evers, Head; Professor Emeriti Lund, Rosenberger, Semeniuk, Stoflet; Associate Professors Sivers (Emeritus), Yost; Assistant Professor Kamstra, Lyons, Swedlund.

**Majors in Textiles, Clothing and Interior Design**

- 1) Textiles and Clothing major with options in Retailing and Apparel Design.
- 2) Interior Design major.

Some courses are offered alternate years while others are offered once a year. Work experience in selling is recommended before the Professional Practicum. To enroll in the Professional Practicum (TC/ID 497) a student must have 95 semester credits and a 2.2 GPA. A double major in TC and in ID requires careful and early planning. Consult your adviser for assistance and current information.

**Minor in Textiles and Clothing**

Sixteen credit hours are required for a Minor in Textiles and Clothing. Plan your minor with a TC adviser early in your program.

**Requirements for a Minor in Textiles and Clothing**

	<b>Credits</b>
Textiles, TC 242 or Clothing as a Human Resource, TC 171....	3-2
Fashion Economics, TC 363 .....	3
Textiles and Clothing Electives (other than core).....	10-11

16

**Fashion Institute of Technology**

The College of Home Economics is affiliated with the Fashion Institute of Technology (FIT) in New York City. Upper division status and a minimum of 2.5 GPA (on 4.0 scale) is required for FIT consideration. FIT courses may be transferred as electives toward the SDSU degree if approved prior to taking them. See TCID department head for further information. Planning should begin in Sophomore year.

**Textiles and Clothing Major**

Courses in textiles and clothing provide knowledge applicable to the use of clothing and household fabrics by individuals and families. The scientific and cultural aspects of textiles and clothing are examined, with emphasis on aesthetic, economic, sociological, and psychological factors.

**Apparel Design Option**

The curriculum in Apparel Design is for students interested in the aesthetic aspects of textiles and clothing and in custom dressmaking, apparel designing, and manufacturing.

**Retailing Option**

The Retailing curriculum is for students interested in careers in the marketing of textiles and clothing products as retailers and manufacturers.

**Interior Design Major**

The curriculum in interior design prepares students to enter the profession of residential/commercial design through course work in technical, material, historical, cultural and aesthetic aspects of design with studios emphasizing the design problem-solving process.

**Textiles and Clothing — Apparel Design Option**

A. Child Development & Family Relations.....	2
CDFR 101 Family Development, 2 cr.	
B. Home Economics Education.....	4
HE 101 Field Experience, 1 cr.	
HEd 101 Career Exploration 1 cr.	
HE 102 Managing Family Resources 2 cr.	
C. Nutrition & Food Science .....	2
NFS 101 Nutrition & Family, 2 cr.	
D. Textiles, Clothing & Interior Design .....	41
TC 101 Clothing & the Family, 1 cr.	
ID 102 Housing & the Family, 1 cr.	
TC 112 Clothing Construction Principles, 2 cr.	
TC 171 Clothing Selection, 2 cr.	
TC 235 Apparel Design & Manufacturing, 2 cr.	
TC 242 Textiles, 3 cr.	
TC 314 Creative Clothing, 4 cr.	
TC 315 Apparel Design, 3 cr.	
TC 350 Dress & Adornment in World Cultures, 3 cr.	
TC 363 Fashion Economics, 3 cr.	
TC 372 History of Costume in Western Civilization, 3 cr.	
TC 412 Tailoring, 3 cr.	
TC 413 Socio-Psychological Aspects of Clothing, 3 cr.	
TC 415 Experiences in Clothing Problems, 3 cr.	
TC Electives, 5 cr.	
Electives from HE, CDFR, NFS, HEd, TC, ID or previously approved FIT courses .....	11
E. Communication .....	9
Engl 101 Freshman Composition, 3 cr.	
Engl 300 Junior Composition, 3 cr.	
SpCm 101 Fundamentals of Speech, 3 cr.	
F. Mathematics.....	3
Math 111, 3 cr.	
G. Natural Science .....	8
Chemistry with lab — Chem 110 or 112, 4 cr.	
Natural Science electives, 4 cr.	
H. Social Science .....	12
Econ 201, Macroeconomics Principles 3 cr.	
Psyc 101, General Psychology 3 cr.	
Soc 100, Introduction to Sociology 3 cr.	
History or Anthropology elective, 3 cr.	
I. Humanities.....	6
ArtS 122 Design I, 3 cr.	
Humanities electives, 3 cr.	
J. Visual Arts.....	15
Art History elective, 3 cr.	
Art Studio or Design elective, 3 cr.	
K. Physical Education.....	2
PE 100 Fitness & Lifetime Activities, 2 cr.	

L. Electives .....	13
Total Credits to Graduate .....	128

### Textiles & Clothing — Retailing Option

Students should have retail experience before the end of the junior year.

A. Child Development & Family Relations.....	2
CDFR 101 Family Development, 2 cr.	
B. Home Economics Education.....	4
HE 101 Field Experiences, 1 cr.	
HE 102 Managing Family Resources, 2 cr.	
HEd 101 Career Exploration, 1 cr.	
C. Nutrition & Food Science .....	2
NFS 101 Nutrition & the Family, 2 cr.	
D. Textile, Clothing & Interior Design.....	46
TC 101 Clothing & the Family, 1 cr.	
ID 102 Housing & the Family, 1 cr.	
TC 171 Clothing Selection, 2 cr.	
ID 211 Art in Today's Home, 2 cr.	
ID 221 Introduction to Interior Design, 3 cr.	
TC 235 Apparel Design & Manufacturing, 2 cr.	
TC 242 Textiles, 3 cr.	
TC 315 Apparel Design, 3 cr.	
TC 363 Fashion Economics, 3 cr.	
TC 372 History of Costume in Western Civilizations, 3 cr.	
TC 373 Merchandising, 3 cr.	
TC 413 Socio-Psychological Aspects of Clothing, 3 cr.	
TC 473 Merchandise Planning & Control, 3 cr.	
TC 490 Pre-practicum in Textiles and Clothing, 1 cr.	
TC 497 Professional Practicum, 7 cr.	
TC/ID electives, 9 cr.	
Electives from HEd, CDFR, HE, TC, ID, NFS or previously approved FIT courses.....	6
E. Communications .....	9
Engl 101 Freshman Composition, 3 cr.	
Engl 300 Junior Composition, 3 cr.	
SpCm 101 Fundamentals of Speech, 3 cr.	
F. Humanities.....	6
ArtS 122 Design I, 3 cr.	
Humanities electives, 3 cr.	
G. Mathematics.....	3
Math 111, 3 cr.	
H. Natural Science.....	15
Chemistry with Lab — Chem 110 or Chem 112, 4 cr.	
Natural Science elective, 4 cr.	
I. Social Science.....	12
Econ 201, Macroeconomics Principles, 3 cr.	
Psyc 101, General Psychology, 3 cr.	
Soc 100, Introduction to Sociology, 3 cr.	
History or Anthropology elective, 3 cr.	
J. Physical Education.....	2
PE 100 Fitness & Lifetime Activities, 2 cr.	
K. Visual Arts.....	6
Art History elective, 3 cr.	
Art Studio/Design elective, 3 cr.	
L. Economics.....	12
Economics and/or Business Administration electives, 12 cr.	
M. Electives .....	10
Total credits to Graduate.....	128

### Interior Design Major

A. Child Development & Family Relations.....	2
CDFR 101, Family Development, 2 cr.	
B. Home Economics Education.....	4
HE 101 Field Experience, 1 cr.	
HEd 101, Career Exploration, 1 cr.	
HE 102 Managing Family Resources, 2 cr.	
C. Nutrition & Food Science .....	2
NFS 101 Nutrition & the Family, 2 cr.	

D. Textiles, Clothing, & Interior Design .....	49
TC 101 Clothing & the Family, 1 cr.	
ID 102 Housing & the Family, 1 cr.	
ID 221 Introduction to Interior Design, 3 cr.	
TC 242, Textiles, 3 cr.	
ID 310 Interior Design Fabrics, 3 cr.	
ID 315 Interior Design Materials, 2 cr.	
ID 316 Interior Design Technology, 2 cr.	
ID 317 Interior Design Practices, 2 cr.	
ID 322/323 Intermediate Interior Design I and II, 3 cr. each	
ID 331 Family Housing, 3 cr.	
ID 373, Retailing, 3 cr.	
ID 422/423 Advanced Interior Design I, and II, 3 cr. each	
ID 424-425 Historical Backgrounds, I and II 3 cr. each	
ID 490 Pre-practicum in Interior Design and Housing, 1 cr.	
ID 497 Professional Practicum, 7 cr.	
Electives from NFS, HEd, CDFR, TC, ID, HE.....	6
E. Communications .....	9
Engl 101 Freshman Composition, 3 cr.	
Engl 300 Junior Composition, 3 cr.	
SpCm 101 Fundamentals of Speech, 3 cr.	
F. Humanities.....	6
ArtS 122, Design I, 3 cr.	
Humanities electives, 3 cr.	
G. Mathematics.....	3
Math 111, 3 cr.	
H. Natural Science.....	8
Chemistry with lab — Chem 110 or 112, 4 cr.	
Natural Science electives, 4 cr.	
I. Social Science.....	12
Econ 201, Macroeconomics Principles, 3 cr.	
Psyc 101, General Psychology, 3 cr.	
Soc 100, Introduction to Sociology, 3 cr.	
History or Anthropology elective, 3 cr.	
J. Physical Education.....	2
PE 100 Fitness & Lifetime Activities, 2 cr.	
K. Visual Arts.....	9
Art History elective, 3 cr.	
Art Studio or Design electives, 6 cr.	
L. Other requirements.....	6
Drafting Competency, see adviser	
Lighting Competency, see adviser	
M. Electives .....	7
Total to Graduate.....	128

## Undergraduate Courses

### Interior Design (ID)

#### 102 Housing and the Family 1(1,0) FS

Space allocation and aesthetic considerations in family housing and how these change during the life cycle.

#### \*211 Art in Today's Home 2(1,2) FS

Elements and principles of design as they relate to the selection of home furnishings. Materials and processes of manufacturing related to product quality. Laboratory experiences focused on accessories.

#### 221 Introduction to Interior Design 3(2,2) FS

Emphasis on functional application of principles and elements of design to the home. Principles of drawing plans and elevations.

#### \*310 Interior Design Fabrics 3(2,2) S

Relationship of weight, color, texture, design of textiles to their application in interiors. Sources or traditional and contemporary fabrics are explored. Lab: Designing and creating appropriate fabric structures. P, TC 242.

**315 Interior Design Materials 2(2,0)**

Study of the characteristics of interior furnishings from raw materials to finished products. Evaluation of quality characteristics of similar product types. P, ID 221.

**316 Interior Design Technology 2(2,0)**

Study of the technical systems used in producing interior living spaces. Survey of building types, plumbing, electrical and HVAC systems. Review and application of local and model codes. P, ID 221.

**317 Interior Design Practices 2(2,0)**

Study of the professional practices of interior design firms. Preparation of specifications and installation documents. Review of installation procedures. P, ID 221.

**322 Intermediate Interior Design I 3(0,6) F**

Introduction to the design process, developing skills specifying materials for interiors. Application of design theory to practical situations. P, 221.

**323 Intermediate Interior Design II 3(0,6) S**

Development of the basic knowledge and skills needed to specify materials for interiors. P, 322 and drafting skills.

**331 Family Housing 3(3,0) FS**

An overview of housing in America including historical influence, space planning, energy conservation, and financing.

**373 Retailing 3(3,0) S**

Principles of merchandising as applied to textiles, apparel and furnishings retailing. Retail store organization and operation. Study of customer, demand, buying, inventory, control and promotion. Field trip to market center is required.

**422 Advanced Interior Design I 3(0,6) F**

Experience in solving commercial design problems within the frame of a business. P, 323.

**423 Advanced Interior Design II 3(0,6) S**

Experience in solving design problems of commercial and contract interiors. P, 422.

**424 Historical Backgrounds of Homes & Furnishings I 3(3,0) F ('87)**

Historical Backgrounds: from Antiquity through the Renaissance.

**425 Historical Backgrounds of Homes & Furnishings II 3(3,0) S ('88)**

Historical Backgrounds: from Renaissance to present.

**450 Shelter and Families 3(3,0)**

Cross-cultural study of world housing and furnishings practices. Relating socio-cultural, aesthetic, technological and physical characteristics of the region to family living patterns. Alt. yrs.

**490 Pre-practicum in Interior Design 1(1,0)**

Discussion of professional practices, and issues. Experience in goal setting, reporting, and evaluation. Organization and preparation of professional documents. P, ID 373 or concurrently.

**492 Special Problems in Interior Design and Housing 1-4**

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

**493 Special Topics in Interior Design and Housing 1-3**

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.

**497 Professional Practicum 1-12 FSSu**

Supervised work experience in a cooperating retail firm or design studio. Provides opportunities for interaction between business, community and the university. P, ID 373, ID 490 and consent of the department. Minimum GPA 2.2.

## Undergraduate Courses Textiles & Clothing (TC)

**101 Clothing & the Family 1(1,0) FS**

Aesthetic and practical clothing needs of the family and how these needs change during the life cycle.

**112 Clothing Construction Principles 2(0,4) FS**

Construction techniques used in garment structures based on commercial patterns. Experience expected.

**171 Clothing as a Human Resource 2(2,0) FS**

Social, psychological and cultural factors affecting dress; selection and coordination of wardrobe aesthetic aspects of clothing and personal appearance.

**235 Apparel Design and Manufacturing 2(2,0)**

Investigation of the taxonomy of various apparel categories, covering merchandising, design, and production considerations. A look at volume apparel manufacturing as well as methods used by the *haute couture*.

**242 Textiles 3(2,2) FS**

Textile fibers, yarns, fabrics, and finishes. Selection, use and care of textiles and clothing. Textile standards and legislation. P, Sophomore standing.

**170 Textiles, Clothing and Interior Design****314 Creative Clothing 4(2,4) FS**

Principles of flat pattern design. Development of original designs through modification of basic sloper. P, 112.

**315 Apparel Design 3(1,4) F**

Study of past and present fashion designers. Working sketches are emphasized. Structural and applied design is included. P, ArtS 122.

**350 Dress and Adornment in World Cultures 3(3,0)**

Cross-cultural study of world dress and adornment practices. Relating the clothing characteristics of selected cultures to their technical and material bases, to manufacture and trade, and to other major social phenomena. Alt. yrs.

**363 Fashion Economics 3(3,0) F**

History and development of fashion industry. Social and economic factors that influence fashion demand. Activities involved in the production, distribution, and consumption of fashion goods. P, Econ 301.

**372 History of Costume in Western Civilization 3(3,0) S**

Development of costumes from ancient times; social significance, symbolic meanings, and functions are investigated. Costume collection in College of Home Economics serves as resource material.

**373 Retailing 3(3,0) S**

Principles of merchandising as applied to textiles, apparel and furnishings retailing. Study of customer, demand, buying, inventory, control and promotion. Field trip to market center is required.

**412 Tailoring 3(0,6) F**

Custom-tailoring techniques applied in suits and coats. P, 112.

**413 Socio-Psychological Aspects of Clothing 3(3,0) F**

Examination of clothing behavior from sociological, psychological and cultural perspectives.

**\*415 Experiences in Clothing Problems 3(0,6) S**

Advanced problems in clothing construction. Interpretation of client's design ideas into a finished garment. P, 314 or consent of instructor. Offered alternate years.

**\*443 Advanced Textiles 3(2,3) S**

Effect of the components of a fabric on total fabric properties: laboratory problems using research equipment. P, 242, Chem 120.

**473 Merchandise Planning and Control 3(3,0)**

Analysis of practicum experience; executive leadership for retail personnel, merchandise planning, management and control. Case study approach. P, TC 497 - 5 credits.

**490 Pre-practicum in Textiles and Clothing 1(1,0)**

Discussion of professional practices and issues. Experience in goal setting, reporting and evaluation. Organization and preparation of professional documents. P, TC 373 or concurrently.

**492 Special Problems in Textiles and Clothing 1-4**

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

**493 Special Topics in Textiles and Clothing 1-3**

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.

**497 Professional Practicum 1-12 FSSu**

Supervised work experience in a cooperating retail firm provides opportunity for interaction between business, community and the university. P, TC 373 and consent of the department, Minimum GPA 2.2. Recommended before the final semester.

## Graduate Courses (TCID)

**544-644 Textiles Chemistry 3(2,2) (Offered on demand)**

Chemistry of textiles including laboratory study of physical and chemical properties of textile fibers and fabrics. Juniors and seniors by special permission.

**573-673 Fashion, Art & Textile Tour 3(3,0) Su**

Understanding the interrelationship of fashion, art and textiles of a specific area of the world. Study of the arts from a historical and contemporary approach. Open to juniors, seniors and graduates.

**592-692 Special Problems in Textiles, Clothing and Interior Design 1-4****743 Current Topics 1-3 cr.****773 Costumes and Textiles Through the Ages 3(3,0) on demand****774 New Developments in Textiles 3(3,0) on demand****790 Seminar in Textiles, Clothing & Interior Design 1-2**

\* Require special fees, equipment, supplies or materials.

# Veterinary Science (Vet)

## College of Agriculture and Biological Sciences

Professor Vorhies, Head; Professor Emeritus Harshfield; Professors Johnson, Kirkbride, Roller, Swanson; Associate Professors Benefield, Francis, Nelson; Assistant Professors Collins, Libal, Shave; Instructors Leslie-Steen, Stotz; Adjunct Professor Evenson.

Complex systems of livestock farming and transportation have greatly increased the opportunity for introduction of animal and avian diseases into herds and flocks. Livestock and poultry producers must give attention to disease prevention and control in their farming and ranching operations. The courses in this department are planned to meet the demand for information in this field, as well as provide basic information in auxiliary areas.

South Dakota does not have a professional College of Veterinary Medicine. A pre-veterinary curriculum is offered which allows students to obtain prerequisites for application to Colleges of Veterinary Medicine in other states. Exceptional students may meet requirements in three years of pre-veterinary study. Most, however, require four years of pre-veterinary work, and many complete a Bachelor of Science Degree before entering professional curriculum of Veterinary Medicine.

Entrance into the professional curriculum in a College of Veterinary Medicine rests with the individual applicant, and is based upon many factors, including their previous academic record. Keen competition should be anticipated, and the student should be aware of the difficulties involved in acceptance to a College of Veterinary Medicine.

The State provides loans to students enrolled in the professional curricula. These loans are administered by the State Board of Regents. The applications forms can be obtained by writing the Board of Regents, Office Building No. 3, Pierre, S.D. 57501.

### Suggested Pre-Veterinary Curriculum

	Credit	
	F	S
<b>Freshman Year</b>		
Fr Comp, Engl 101.....	3	or 3
Algebra, Math 111 or Algebra & Trigonometry, Math 113.....	3-5	or 3-5
Gen Chemistry, Chem 112-114.....	4	4
Intro Biology, Bio 151-153.....	3	3
Fund of Speech, SpCm 101.....	3	or 3
Elements of Dairying, DS 130.....	3	
Intro to Animal Science, AS 101.....		3
Elective.....		3
Fitness & Lifetime Activities, PE 100.....	1	1
<b>Sophomore Year</b>	F	S
Fund of Organic Chemistry, Chem 222-224...	4	4
Elementary Physics, Phys 111-113.....	4	4
Animal Nutrition, AS 223.....		3
Poultry Management, AS 366.....	3	
Invertebrate Zoology, Zool 357.....		4
Vertebrate Zoology, Zool 365.....	4	
<b>Junior Year</b>	F	S
Quantitative Analysis, Chem 232.....	4	
Biochemistry, Chem 260.....		4
Gen Microbiology, Micr 231.....		4
Embryology, Zool 383.....	4	
Jr Comp, Engl 300 & Technical Communication, Engl 303.....	3	3
Genetics, Bio 371.....	3	
Electives.....	3	4

\* This curriculum does not meet the pre-veterinary requirements of all Colleges of Veterinary Medicine. The student and his adviser, may alter the pre-veterinary curriculum to meet specific requirements of certain colleges.

## Undergraduate Courses

### 223 Anatomy & Physiology of Livestock 4(3,3) S

General principles of anatomy and physiology are applied to all animals. Important species differences are described for the bovine, equine, porcine, ovine and aves.

### 403 Animal Diseases & Their Control 3(3,0) F

Diseases of livestock, poultry, and wildlife, with emphasis on sanitation, prevention and control. P, Micr 231.

## Graduate Courses

### 590-690 Problems in Veterinary Science 1-3 as arranged FS

Consent of staff.

### 723 Advanced Systematic Physiology 4(3,3) F

### 725 Advanced Systematic Physiology 4(3,3) S

### 727 Endocrinology 4(3,3) F

## Visual Arts (Art)

### College of Arts and Science

Professor Gambill, Head; Professors Edie, Morgan, Professor & Director of Memorial Art Center J. Stuart; Associate Professors Berry (Emeritus), Kruse, Spinar; Assistant Professors Boyd, Steele, S. Stuart.

The curricula in Visual Arts are designed to provide fundamental experiences in visual knowledge/decision-making and in the mechanisms of creativity for all students, regardless of college major. For those students wishing to pursue careers as artists, art educators, or designers, the program offers the necessary background for either post-graduate careers and/or graduate study areas.

Works of art and design by students, faculty, and visiting or invited artists and designers are exhibited throughout the year in the Department galleries — the Ritz Gallery and the Mini-Gallery.

### Visual Arts Curricula

Leading to the degrees Bachelor of Arts or Bachelor of Science

The Visual Arts major must:

- I. Meet University Requirements (pages 14-16) and Arts and Science College Requirements (pages 36-37).
- II. Take Visual Art courses in Art Studio, Applied Design (Graphic Design), or Art Education that include:
  - A. Visual Arts Core: Basic Studio Courses. (See details following.)
  - B. Visual Arts Core: Art History Courses. (12 hours—Arth 211 and 212 plus two elective courses). (See details following.)
  - C. Visual Arts Curricula: Required Courses and Electives in Area of Concentration — Visual Arts (Art Studio), Applied Design (Graphic Design), or Art Education. (See details following.)
- III. Present works for faculty evaluation before the senior year.
- IV. Have an exhibition of creative work or present a portfolio during the senior year; either must involve a faculty review.
- V. Complete requirements plus electives that total a minimum of 128 credit hours (I. and II. above; see details following).

**NOTE:** The Department of Visual Arts reserves the right to retain selected examples of student work from any course.

- A. **Visual Arts Core:** basic studio courses should be completed during the freshman and sophomore years.

	Credits
Arts 112 Drawing I.....	3
Arts 122 Design Fundamentals.....	3
Arts 123 Three Dimensional Design.....	3
Arts 113 Drawing II.....	3
Arts 211 Drawing III.....	3
Arts 222 Color Theory.....	3
Art Electives (see Requirements under C.) should be taken only after some of the Visual Arts Core is completed.	

**B. Visual Arts Core:** art history courses

ArH 211 Survey of World Art and Architecture.....	3
ArH 212 Western Traditions.....	3

(These should be taken during the sophomore and junior years.)

Art History Electives.....	6
----------------------------	---

**C. Visual Arts Curricula:** must begin in sophomore year.

**1. Applied Design (Graphic Design):**

ArtD 231 Graphic Design I (2 sem.).....	6
ArtD 330 Graphic Design II (2 sem.).....	6
MCom 160 Basic Photography.....	2
ArtS 494 Coop Ed/Internship/ Field Experience.....	3
Prtg 111 Basic Presswork.....	3
Prtg 213 Reproduction Photog.....	4
Art Electives.....	12

The 4 Graphic Design courses must be taken in sequence.

**2. Art Education:**

ArtS 253 Ceramics I.....	3
ArtS 241 Sculpture I.....	3
ArtE 415 Methods of Teaching Art in Public Schools.....	3

Education Block, Practice Teaching (26 hours)  
Remaining 6 hours of Art Electives may be taken in the studio area of your choice. It is suggested you take additional studio courses as electives to increase proficiency.

**3. Art Studio:**

**a. Ceramics**

ArtS 253 Ceramics I.....	3
ArtS 352 Ceramics II (2 sem.).....	6
ArtS 491 Directed Studies in Ceramics.....	6
ArtS 241 Sculpture I.....	3
ArtS 231 Painting I.....	3
ArtS 430 Watercolor.....	3
Art Electives (one must be ArtS 270 or 370).....	12

**b. Painting**

ArtS 231 Painting IA & IB.....	6
ArtS 332 Painting IIA & IIB.....	6
ArtS 281 Printmaking IA & IB.....	6
ArtS 382 Printmaking IIA & IIB.....	6
ArtS 430 Watercolor.....	3
Art Electives (1 3D).....	9

**c. Printmaking**

ArtS 281 Printmaking IA & IB.....	6
ArtS 382 Printmaking IIA & IIB.....	6
ArtS 231 Painting I (2 sem.).....	6
ArtS 430 Watercolor.....	3
Arts Electives (1 3D).....	9

**d. Sculpture**

ArtS 241 Sculpture IA & IB.....	6
ArtS 342 Sculpture IIA & IIB.....	6
ArtS 491 Directed Studies in Sculpture.....	3
ArtS 253 Ceramics I.....	3
Art Electives.....	6

**NOTE:** Other courses, not offered under Art may be counted as credit for a major with permission of the Department Head and major supervisor. These courses must reflect curricular precedents in nationally recognized programs.

**Visual Arts Minor**

A minor in Visual Arts requires 24 semester hours, including at least two courses in art history.

**Undergraduate Courses**

**Art Design (ArtD)**

**112 Lettering 3(0,6) FS**  
The aesthetics of historic letter forms from European and Western cultures and its application to contemporary visual communication. No prerequisites required.

**231 Graphic Design I 3(0,6)**

The study of visual communication and design theory. Discussion of design ethics and the relationship of the designer to society. \*P, ArtS 122 or consent of the instructor.

**330 Graphic Design II 3(0,6)**

The exploration of typographic form through historical and contemporary alphabet categories, and the application of typography to graphic communication theories. \*May be repeated once. P, ArtD 231.

**Art Education (ArtE)**

**415 Methods of Teaching Art in Public Schools 3(1,4) F**

P, art major and junior standing.

**Art History (ArtH)**

**100 Art & Design Appreciation 3(3,0)FS**

Introduction to traditional and new visual media in art and design with a stress on practical knowledge. Primarily for non-art majors.

**211 Survey of World Art and Architecture 3(3,0) F, Alternating fall semesters.**

Principal periods in the history of major world civilizations up to the 15th century A.D.

**212 Western Traditions in Art and Architecture 3(3,0) F Alternating fall semesters.**

Principal artistic styles in western culture: Renaissance to present.

**310 History of U.S. Art and Architecture 3(3,0)**

From colonial to present.

**320 Renaissance and Baroque Art and Architecture 3(3,0)**

Survey stressing the art historical monuments of Italy, Spain, and Northern Europe. P, ArtH 100, Art 212, or consent.

**350 Oriental Art and Architecture 3(3,0)**

Survey stressing the art historical monuments of India, China, and Japan. P, Art 211, or consent.

**400 Seminar in Art Criticism 3(3,0)**

Reading and discussion of criticism and aesthetics in visual art and design. Analyses of various critical stances and instruction in writing about visual arts. P, junior or senior standing. Recommend ArtH 100 or 212.

**412 Studies in Modern or Contemporary Art and Design 3(3,0) S**

Surveys of specific periods and topics in 19th and 20th century art. \*P, junior or senior standing. Recommend ArtH 100 or 212.

**420 Seminar, Selected Topics in Art or Design 1(1,0) S**

Selected topics in Art History, Theory, or Criticism. Topics vary, may be repeated once. \*P, junior or senior standing. Recommend ArtH 100 or 212.

**Art Studio (ArtS)**

**112 Drawing I 3(0,6) FS**

Development of Visual perception in representational and expressive drawing in various media, stressing the language of visual communication of ideas through observation, analysis and expression. No prerequisite required.

**113 Drawing II 3(0,6) FS**

Continuation of Drawing I with additional emphasis on developing conceptual and critical abilities related to the expression of visual ideas. P, ArtS 112, or consent of the instructor.

**122 Design Fundamentals 3(0,6) FS**

Experience in the understanding, appreciation, creation and critical appraisal of visual ideas in a two-dimensional context. Development of perceptual and conceptual visual thinking. No prerequisite required.

**123 Three Dimensional Design 3(0,6) FS**

History, theory, aesthetics and materials of the three dimensional design language. Organization of mass, plane, texture, color, space in visual problem-solving experiences. No prerequisites required.

**211 Drawing III 3(0,6) FS**

A continuation of Drawing I with an emphasis on developing the visual intellectual and technical aspects of drawing the human figure. \*P, Arts 112 or consent of the instructor.

\*Denotes course may be repeated once.

**222 Color Theory 3(0,6) S**

Survey of color theories from Goethe to Albers. Studio problems explore and evaluate the physical and psychological properties of color and color relationships as they pertain to individual visual expression. P, ArtS 122; recommend ArtS 112 or consent of the instructor.

**231 Painting IA & IB 3(0,6) FS**

Combine studio experience in drawing and painting with demonstrations and discussion on style, technique, color and composition as they relate to the expression of visual ideas. \*P, ArtS 112, or consent of the instructor.

**241 Sculpture IA & IB 3(0,6) S**

Introduction to theory of sculpture through various historical and current teaching methods: construction, modeling, carving, casting. \*P, ArtS 123 or consent of the instructor.

**253 Ceramics I 3(0,6) FS**

The study of the ceramic heritage from various cultures in relation to contemporary clay objects. Projects expose students to hand-building, throwing, glazing and firing. \*ArtS 123 or ArtS 122 recommended.

**270 Textile Design 3(0,6) On sufficient demand.**

Exploration of the cultural, historic and aesthetic backgrounds of surface design techniques. Design and execution of these theories on fabric. \*P, ArtS 122 or consent of the instructor.

**281 Printmaking IA & IB 3(0,6) FS**

Creative use of basic printmaking techniques and processes in relief, intaglio and serigraphy to develop conceptual abilities for the solution of individual problems in visual communication. \*P, ArtS 112 or consent of the instructor.

**300 Experimental Arts 3(0,6) On sufficient demand.**

Alternative art-making, utilizing contemporary aesthetics. P, junior or senior standing.

**332 Painting IIA & IIB 3(0,6) FS**

Continuation of Painting I. Emphasis on composition and expression. \*P, ArtS 231, or consent of the instructor.

**342 Sculpture IIA & IIB 3(0,6) S**

A continuation of exploration of traditional and contemporary forming methods with more emphasis on individual creative expression. \*P, Arts 241.

**352 Ceramics II 3(0,6) FS**

Continuation of Ceramics I. Emphasis on wheel throwing, glazing, stacking, and firing. \*P, ArtS 253.

**370 Weaving 3(0,6) FS**

Exploration of the cultural, historic and aesthetic backgrounds of weaving. Design and execution of various weave patterns. \*P, ArtS 122 or consent of the instructor.

**382 Printmaking IIA & IIB 3(0,6) FS**

Continuation of Printmaking I. Creative use of advanced printmaking techniques and processes in relief, intaglio, and serigraphy. \*P, ArtS 281.

**430 Watercolor 3(0,6) S**

Creative experience in developing and evaluating visual ideas expressed through the watercolor medium. Discussion and utilization of master artists' watercolor approaches and techniques. \*P, ArtS 112 or consent of the instructor.

**491 Directed Studies Program 1-9 (0,3-18)**

See Arts and Science College Directed Studies Program page 34. P, permission of Department Head and the instructor. Limited to no more than 3 semester hours under any single instructor. May be continued with more than one instructor (or under different sponsor).

**492 Problems in Visual Arts 3(0,6) FS**

Independent study in art area arranged in consultation with the instructor. Limited to seniors with a 3.0 average in art and a working background in the art problem they wish to under-take.

**493 Undergraduate Course Special Program 1-3(0,6)**

See Undergraduate Course Special Program page 34. P, permission of the Department Head.

**494/495/496 Cooperative Education/Internship/Field Experience 1-12 FSSu**

See Cooperative Education/Internship/Field Experience program on page 34. You may elect to initiate and complete a major problem off campus. All Visual Arts majors may gain experiential work experience in coop jobs with selected employers and/or artists (students may be engaged as studio apprentices). Graphic Design majors may only take three credit hours. These work experiences are to be held concurrently with the regular study periods and may be arranged through the Department's Cooperative Education Coordinator. P, junior standing, consent of Department Head and adviser.

**497 Living and Studying Abroad Program 1-15 (1-15, 3-30)**

See Arts and Science Living and Studying Abroad Program, page 35. P, permission of Department Head.

\*Denotes course may be repeated once.

## Wildlife and Fisheries Sciences (WL)

### College of Agriculture and Biological Sciences

Associate Professor Scalet, Head; Professors Bjugstad, Flake; Professor Emeritus Linder; Associate Professors Berry, Modde, Uresk; Assistant Professors Higgins, McCabe.

The curriculum offers professional education in fisheries, wildlife, and related biological and environmental areas. It covers a broad spectrum of physical and biological sciences as well as social sciences, humanities, and other courses essential to understanding the relationship of man to his environment.

This curriculum prepares students for a variety of positions with state and federal agencies such as state conservation organizations, U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. National Park Service, U.S. Soil Conservation Service, U.S. Public Health Service, etc. Private industry employs biologists as biological consultants on environmental problems. By taking prescribed education courses students can obtain certification to teach biology in secondary schools.

In addition by taking required courses and two additional courses students meet the academic requirements for certification by both the American Fisheries Society and The Wildlife Society.

The Department offers both the Bachelor of Science and Master of Science degrees. A student who plans on a career in research should complete the advanced degree.

Research funded through the Cooperative Fish and Wildlife Research Unit, S.D. Agricultural Experiment Station, and outside granting agencies offers opportunities for financial assistance to qualified students working for the graduate degree.

#### Curriculum in Biological Science

##### Wildlife and Fisheries Sciences Major

Leading to the Bachelor of Science degree

	Credit
<b>Freshman Year</b>	
Fund of Speech, SpCm 101 .....	3
Fr Comp, Engl 101 .....	3
Humanities elective .....	3
Intro to Sociology, Soc 100 .....	3
Biology, Bio 151-153.....	6
Algebra, Math 111 and Trigonometry, Math 120.....	6
or	
Algebra & Trigonometry, Math 113.....	5
General Chemistry, Chem 112.....	4
Fitness & Lifetime Activities, PE 100.....	2
Intro to Wildlife and Fish, WL 220 .....	2
<b>Sophomore Year</b>	
Principles of Ecology, Bio 211.....	3
Elementary Organic Chemistry, Chem 120 .....	4
Macroeconomics Principles, Econ 201 .....	3
Elementary Physics, Phys 111-113.....	8
Calculus, Math 222 or 123.....	5
Chemistry elective (Chem 260, 232, or 380).....	4
Humanities elective .....	3
Undergraduate Seminar, WL 490.....	½
<b>Junior Year</b>	
Junior Comp, Engl 300.....	3
Mammalogy, Zool 355 .....	3
Ichthyology, WL 367* .....	3



General Microbiology, Micr 231.....	4
Principles of Fisheries Management, WL 412* .....	3
Communications elective.....	2 or 3
Computer Science, CSc 271 or 311 .....	3 or 4
Social Science elective.....	3
Botany elective (Bot 201, 301, 305, 415 or F 231).....	3 or 4

**Senior Year**

Principles of Wildlife Management, WL 411* .....	4
Genetics, Bio 371 .....	3
Physiology elective, Bot 427 Bio 343 or Zool 325 .....	3 or 4
Undergraduate Seminar, WL 490.....	½
Statistical Methods I, Stat 341 .....	3
Ornithology, WL 365* .....	4
Botany Elective (Bot 201, 301, 305, 415 or F 231) .....	3 or 4

Remaining hours of the 128 hour requirement are electives

\* Field trips required in these courses may result in pro-rate charges to defray transportation costs.

This curriculum fits the needs of the average student. Where preparation for special fields is desired, substitutions may be made with the approval of the head of the department. For a more complete curriculum sheet, contact the department.

**Undergraduate Courses**

**210 Environmental Conservation 2(2,0) FS**

Ecological approach to conservation; man's past and present impact on world environments; wise use of natural resources, including soil, water, air, forests, rangelands, energy, wildlife and fisheries.

**220 Introduction to Wildlife and Fisheries Management 2(2,0) F**

An introduction to the basic principles used in the management of wildlife and fish populations. The course is directed towards the presentation of general concepts.

**363 Ornithology 4(3,3) S\***

Identification of game and non-game bird species; life histories, habits, and special structural and physiological adaptations of various groups. Introduction to the ecology of native and introduced game birds of North America.

**367 Ichthyology 3(2,3) F\***

Characteristics and relationships of fish and fish-life vertebrates; adaptations, modifications, and ecological relationships; identification of common game and forage fishes; economic and recreational importance of various groups. Special reference to fishes of the north-central and northern Great Plains states.

**411 Principles of Wildlife Management 4(3,2) F\***

Application of ecological principles to the management of wild birds and mammals. History and development of wildlife management as a science; wildlife agencies and legislation; characteristics of, and factors affecting wildlife populations; techniques and theory of management; wildlife conservation and biopolitics. P, WL 363; Zool 355; or consent.

**412 Principles of Fisheries Management 3(2,3) S\***

Fisheries management as a science with emphasis on freshwater game fishes and freshwater ecosystems. Fish life histories, food habits, length-weight relationships, and age and growth characteristics. Methods of study of fish habitat, fish populations, and yield. Managing lakes, streams, and ponds for fish production. P, WL 367 or consent.

**490 Undergraduate Seminar ½(1,0) FS**

Individual reports and group discussions on recent research and management developments in wildlife, fisheries, and related fields; employment opportunities and procedures for employment. Required of majors; each student allowed one credit toward graduation. Taken spring semester of sophomore year and fall semester of senior year.

**494-495-496 Cooperative Education/Internship/Field Experience 1-12, FSSu**

Planned and supervised professional experience related to wildlife and fisheries conservation which takes place outside the formal classroom associated with federal, state, or private operations.

**Graduate Courses**

**511-611 Limnology 4(2,6) S\* (Offered in 1987)**

Physical, chemical, and biological characteristics of lakes, ponds, and streams. Analysis of factors and processes that operate in fresh-water systems. Methods of measuring and evaluating these factors and processes. P, Chem 114, Phys 113, Biol 211, or consent.

**513-613 Fisheries Science 3(2,3) F\* (Offered in 1986)**

Methods, facilities, and techniques of intensive and extensive fish culture, including parasites and diseases. This includes both sport and commercial culture. In addition principles and techniques of selected practices for reservoir, pond, and stream management. P, WL367, 412, or consent.

**515-615 Upland Game Management 3(2,3) S\* (Offered in 1987)**

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.

**517-617 Big Game Management 3(2,3) S\* (Offered in 1988)**

Big game animals life histories and field techniques for research and management. Recreational, economic, and aesthetic importance of big game species and domestic livestock. P, WL 411 or consent.

**519-619 Waterfowl Management 3(2,3) F\* (Offered in 1987)**

Ecological and socio-economic factors affecting waterfowl habitat and waterfowl populations. State and Federal programs affecting wetland drainage and wetland preservation. Techniques of wetland management. Field inspection of waterfowl production habitat in the north-central states. P, WL 411 or consent.

**590-690 Special Topics in Wildlife & Fisheries\* 1-3 credits as arranged FSSu**

Students may secure small-group instruction in a variety of special topics including ecosystem analysis of wetlands, grasslands, woodlands, small ponds, or reservoirs. Other special topics offered on occasion are animal damage control, endangered species, techniques of analysis, wildlife law enforcement, public relations for resource managers, non-game bird management, and other topics. Contact department head concerning planned special topics. P, graduate or senior undergraduate and consent.

**591-691 Wildlife Research Problems 1-2 credits as arranged FSSu**

Arrangements must be made with supervising staff member prior to registration. P, cumulative grade point average of at least 2.75 and permission of instructor.

**711 Aquatic Ecology 4(2,6)**

**713 Animal Population Dynamics 3(2,3)**

**790 Thesis in Wildlife 5-7 credits**

**792 Graduate Seminar 1(1,0)**

\* Field trips required in these courses may result in pro-rate charges to defray transportation costs.

**Women's Studies**

Professor Eleanor Schwab, Coordinator, Department of Political Science

An interdisciplinary program enabling you to select courses dealing directly or indirectly with women, including the development of feminism, women's changing roles in the family, religion, the labor force, and politics. Particularly useful for students expecting to work with women in social work, counseling, nursing, business, education. 17 hours are selected from the list of required and elective courses in consultation with Women's Studies Coordinator.

**Women's Studies Minor**

Required Courses

Course	Credit
Contemporary Health Problems HSc, 212.....	2
Marriage, Soc 250.....	2
Dynamics of Family Development, CDFR 342 .....	2
Women in American Culture, Hum 213.....	3
Current Issues in Religion: Feminism & Theology, Rel 349 .....	3
Seminar, Women & Politics, PolS 429 .....	3
Woman Health Care Professions, Nurs 422.....	2

Elective Courses

Course	Credit
Seminar Women in the Labor Force, CGPS 592/692.....	3
Special Studies: Image of Women in Am. Lit, Engl 597/697 .....	3
Course Special: Women in Foreign Language, MFL .....	3
Sociology of Sex Roles, Soc 497 .....	3
American Women: Roles & Relationships, CDFR 594/694 .....	3
American Lit. Seminar: Women Writers, Engl 594/694.....	3
Engl, Lit Seminar: Selected Engl. Women Writers, Engl 593/693 .....	3
Biology and the American Woman, Bio 597/697 .....	3
History of Women in America, Hist 360 .....	3

# Index

## A

Abbreviations, 27, 54  
Absence, 17  
Academic  
advisement, 17  
calendar, 2  
deans, 5  
information, 14-21  
performance requirements, 19  
policies and Procedures, 7-13  
support services, 25  
Accounting, 83  
Accreditation, affiliations and, 7, 38, 41, 44  
Activities, student, 24  
Adding courses, 18  
Administration  
business, 67, 84  
educational, 87  
Admission fee, 7, 10  
application, 7  
as a special student, 10  
by certificate or examination, 10  
by high school students, 8  
correspondence credit, 10  
non-resident, 8  
international students, 10  
procedure, 7-9  
to education courses, 38  
to graduate school, 23  
to the university, 7  
resident, 8  
readmission, 8, 10  
reciprocity, 8  
requirements, 8-9  
transfer students, 9  
with advanced placement, 10  
Adult education, 22, 86-87  
Adult Fitness and Cardiac Rehabilitation Concentration, 35, 105  
Advanced  
air ROTC, 55-56  
army ROTC, 135-137  
placement, 10  
residence hall advanced payment, 12  
Advertising sequence, journalism, 35, 121-122  
Aerospace engineering, 130  
Aerospace studies, 35, 55-56  
Aids, financial, 13  
Affiliation and Accreditations, 7, 38, 41, 44  
Agricultural  
business, 30, 31, 80-81, 156  
economics, 30, 81  
education, 30, 85-86  
engineering, 42, 56-58  
experiment station, 4, 6  
extension courses, 30, 58-59  
extension service (Cooperative) 4, 6  
general, 28, 32-33  
journalism, 30, 121, 122-123  
production or technical option, 31  
science option, 31  
Agriciculture  
college of, and  
biological sciences, 30-33  
core curriculum in agriculture, 31  
core curriculum in biological sciences, 31-32  
general, 28, 32-33  
international option, 33  
mechanized, 132-133  
two-year certificate, 28  
Agronomy major, see plant science, 30, 156  
Animal Science, 30, 59-61  
Anthropology, 163  
Apparel design option, 167  
Application  
fee, 7, 10  
procedure, 7-8  
re-admission, 7  
teacher education, 38  
Army ROTC, 135-137  
Art, see Visual Arts, 35, 171-173  
applied design, 35, 170  
core requirements, 170  
education, 35, 170  
visual arts, 170, 171  
Arts and Science, College of, 34-37  
degree requirements, 36  
Assistance, financial, 13  
Associate degree, 27-28  
Association fee, students, 12  
Athletic coaching concentration, 35, 105  
training minor, 35, 105  
Athletics, 34, 104  
Attendance, class, 17  
Auditor, 18  
Aviation education, 27  
Awards and student loans and scholarships, 13

## B

Bachelor's degree, 14  
Band, 34, 137  
Basic air ROTC, 55-56  
Basic army ROTC, 135-137  
Bioengineering, 90  
Biological sciences  
biology major, 30, 35, 62, 63-64  
College of Agriculture and, 30-33  
core curriculum, 31-32  
dairy manufacturing major, 78  
microbiology major, 134-135  
university requirement, 16  
wildlife and fisheries science, 172-173  
Board and room, 11  
Board of Regents, 5  
Botany, 30, 35, 64-65, 66  
Broadcast journalism sequence, 35, 121, 122  
Business Area Studies, 67-68, 84  
Business option, agriculture, 31, 84-85, 156

## C

Calendar, University, 2  
Campus educational aids, 25  
Campus services, 23-34  
Career planning & placement, 24  
Catalog entries, 26  
Certificate  
of completion, 27  
Programs, 27-28  
Chemistry, 68-72  
applied, 35, 68  
clinical laboratory technology, 69-70  
food and nutrition, 68  
general, 68  
Professional, 68  
Teaching option, 35, 68  
Child Development  
and Family Relations, 48, 72-74  
child and family services, 48, 73  
cooperative program, 73  
early childhood education option, 48, 72  
Choral music education, 35, 138  
Chorus, 34, 137  
Civil Engineering, 42, 74-77  
Clarification of residency for fee and tuition purposes, 12  
Class  
attendance policy, 17  
rank, 20  
Clinical laboratory technology, 35, 69-70  
Closed circuit TV, 25  
Clothing (Textiles and Interior Design)  
apparel design option, 48, 167  
retailing option, 48, 167-168  
Code, student, 26  
College of  
agriculture and biological sciences, 30-33  
arts and science, 34-37  
engineering, 41-43  
general registration, 44-47  
home economics, 48-49  
nursing, 50  
pharmacy, 51  
Communications  
and advanced electronics, 90  
Disorders, 36, 165  
requirements, 14  
Computer  
assisted instruction, 25  
data processing systems, 42, 90  
science, 42, 77-78  
software development, 42  
system design, 42  
Conduct, student, 26  
Continuing Education, Nursing, 50  
Cooperative  
Education Program, 24, 32, 34, 43  
Extension Service, 4, 6-7  
Core curricula  
agriculture, 31  
arts and science, 37  
associate degree, 27  
biological science, 31-32  
also see, graduation requirements, 14-16  
home economics, 48-49  
pharmacy, 51  
two-year terminal, 27-28  
Correspondence credit, 10  
Counseling  
guidance and, 87  
service, 23  
Course  
descriptions, 26  
fees, 11  
non-degree, 18  
numbering system, 26  
repeating, 19

specials program, 34  
Credit, 14  
auditor, 18  
correspondence, 10  
entrance, 10  
examinations for, 10, 19-20  
graduate for seniors, 23  
overloads, 17  
semester, 14  
undergraduate transfer, 9  
Curriculum entries, 26

## D

Dairy  
business option, 79  
manufacturing, 30, 78-79  
production, 30, 79  
science, 79  
science option, 79  
teaching option (specialized), 79  
Dance education, 105, 107  
Deans, academic, 5  
Debate, 34, 165  
Definition and clarification of fees, 10-11  
Degree  
general, 14-16  
requirements arts and sciences, 36-37  
Degrees offered  
associate, 27-28  
bachelor's, 14  
graduate, 22  
Dentistry, 45  
Departments of instruction  
aerospace studies, 55-56  
agricultural education, 85-86  
agricultural engineering, 56-58  
agricultural extension, 58-59  
agricultural journalism, 121, 122-123  
animal science, 59-61  
art, see visual arts, 171-173  
associate degree programs, 27-28  
aviation education, 27  
biology, botany, zoology, 62-67  
chemistry, 68-72  
child development and  
family relations, 48, 72-74  
civil engineering, 74-77  
computer science, 77-78  
counseling, guidance and personnel  
service, 87  
dairy science, 78-80  
economics, 35, 80-85  
education, 85-89  
electrical engineering, 89-92  
electronics engineering technology, 92, 100-102  
engineering graphics, 92, 99  
engineering mechanics, 92, 99-100  
engineering shop, 92, 100  
English, 35, 92-94  
European Area Studies program, 35, 94-95  
foreign language, 95-98  
forestry, 119-120  
general engineering, 98-102  
geography, 102-104  
health, physical education and  
recreation, 104-110  
health science, 110-111  
history, 111-113  
home economics, 115  
home economics education, 48, 113-114  
home economics extension, 48, 114  
home economics journalism, 114  
honors program, 116  
horticulture, forestry, landscape and  
parks, 116-120  
humanities, 120  
Indian area studies program, 120  
journalism and mass communications, 121-126  
Latin American area studies program, 126  
mathematics, 126-129  
mechanical engineering, 129-132  
mechanized agriculture, 132-134  
microbiology, 134-135  
military science, 136-137  
music, 137-142  
nursing, 142-146  
nutrition and food science, 48, 146-150  
pharmacy, 150-151  
pharmaceutical sciences, 151-152  
pharmacy practice, 152  
philosophy and religion, 152-153  
physics, 153-155  
planning, 155-156  
plant science, 156-159  
political science, 159-161  
printing, 28, 124-126  
psychology, 161-162  
religion, 152  
reserve officer training program, 55-56, 136-137

rural sociology, 162-164  
 speech, 165-167  
 statistics, 167-168  
 textiles, clothing and interior design, 168-170  
 veterinary science, 171  
 visual arts, 171-173  
 wildlife and fisheries sciences, 173-174  
 women's studies, 174

Deposits, 11

Descriptions, course, 26

Dial Access Center, 25

Dietetics, 48, 146

Directed Studies, 34-35

Division of  
 Education, 38-40  
 Lifelong Learning, 22

Doctor of Philosophy, 22

Drama, 34

Driver education, 87

Dropping courses, 18

## E

Economics, 80-85  
 commercial, 35, 81-82  
 general, 35, 82-83  
 teaching option, 35

Education  
 agricultural, 85-86  
 art, see visual arts, 170  
 aviation, 27  
 continuing, see lifelong learning, 22  
 cooperative program, 24  
 counseling, guidance and personnel services, 87  
 curriculum, 39-40  
 dance, 105, 106-107  
 division of, 38-40, 85  
 drivers, 87  
 elementary, 88  
 evaluation and research, 87-88  
 health, 107  
 home economics, 48, 113-114  
 minors, 39  
 music, 34, 137  
 nursing, continuing, 50  
 printing, 121, 124-126  
 secondary, 88-89  
 teacher, 39-40  
 vocational teacher training, 89

Educational  
 administration, 87  
 aids, campus, 25  
 evaluation and research, 87-88  
 foundations, 88  
 objectives, 5-6  
 psychology, 88

Elective work, 18

Electives  
 humanities, natural science, biological science, physical science, and social science, 15-16  
 pass-fail, 19  
 unpenalized, 19, 37  
 work, 18

Electric Power and Processing, 42, 57

Electrical engineering, 42, 89-92

Electronics engineering technology, 42, 100-102

Elementary education, 88  
 physical education concentration, 35, 105

Engineering  
 aeronautics, 42, 130  
 agricultural, 56-58  
 associate degree programs, 27-28  
 civil, 74-77  
 college of, 41-43  
 bio-, 42, 91  
 communications, 42, 90  
 computers/data processing, 42, 90  
 electrical, 42, 90-92  
 electronics engineering technology, 100-102  
 environmental, 42, 75, 130  
 foundations, 42, 75  
 general, 98-102  
 graphics, 99  
 heat-power, 42  
 highway, 42, 75  
 hydraulics, 42, 75  
 industrial, 43, 130  
 machine design, 42, 130  
 mechanical, 129-132  
 mechanics, 99-100  
 nuclear, 42, 130  
 physics, 42, 153-155  
 power systems, 42, 90  
 remote sensing, 42  
 shop, 100  
 solid state systems, 42  
 structures, 42, 75  
 thermal, 42, 130  
 water resources, 57

English, 92-94  
 education, 35, 92  
 English skills requirements, 10, 14-15

Entomology, see plant science, 157

Entrance  
 all colleges except engineering, 7-10  
 by certificate or examination, 10  
 engineering, 41-42  
 freshman credits, 7-10  
 requirements, 8-10

Environmental management, 30, 35, 42, 57, 63, 103  
 engineering, 130

Equipment distribution and media production, 25

Establishment of the University, 4

European area studies, 94-95

Examinations  
 auditor, 18  
 entrance, 8  
 for university credit, 19-20  
 placement, foreign languages, 17

Expenses  
 continuing education, 22  
 nursing, 10  
 student, 10  
 summer session, 22

Experimental courses, 26

Experiment Station, Agricultural, 4, 6

Extension  
 agricultural, 30, 58-59  
 continuing education, 22  
 courses, 58-59  
 home economics, 114  
 service, cooperative, 4, 6

## F

Faculty, 5

Fail, Pass, System, 19

Family Relations, Child Development and, 48, 72-74

Family student housing, 12

Fashion Institute of Technology, 167

Fees  
 application, 7, 10, 11  
 continuing education, 22  
 definition and clarification of 10-11  
 general deposit, 11  
 instructional, 10  
 nursing students' special, 10-11  
 residence hall advance, 11, 12  
 student association, 11  
 late, 10  
 summer session, 22  
 university student, 10

Film library, 25

Financial  
 aids, 12, 13  
 assistance, 13

Flight training, 27

Food and Nutrition Chemistry, 35, 69

Food Science option, 146-147

Food Science, Nutrition, 48, 147-148

Food Service, 11, 12

Food Service refunds, 12

Foreign Language, 95-98  
 business specialization, 35, 96-97  
 policy, 17  
 teaching option, 35, 96

Foreign Students, admission, 8, 10

Forensics, 34, 165

Forestry, 120

Freedom, student code of, 26

French, 35, 97

Freshman entrance credits, 7-9

## G

General  
 administration, 5  
 agriculture, 28, 30, 32  
 chemistry, 35, 68-72  
 communications, 124, 166  
 degree requirements, 14-16  
 deposit, 11  
 engineering, 42, 98-102  
 music education, 35, 137  
 personal studies, 35, 36  
 registration, College of, 44-47  
 university requirements, 7-21

Genetics, 33

Geography, 35, 102-104  
 environmental management, 35, 103  
 urban and regional, 35, 103  
 technical geography - foreign language, 35, 103  
 technical geography - science, 35, 103

German, 35, 97-98

Government, student, 25

Grade points, average, 19

Grading system, 19

Graduate

admission, 23  
 course numbers, 26  
 credit for seniors, 23  
 information, 22-23  
 school, 22-23  
 study in education, 40  
 study in home economics, 49  
 study in pharmacy, 51

Graduation  
 honors, 20  
 requirements, 14-16

Graphic design (applied design), 35, 170

Guidance, Counseling, and Personnel Services, 87

## H

Health  
 application, 8  
 education, 35, 105, 107  
 physical education and recreation, 35, 104-110  
 science, 50, 110-111  
 service, student, 24

High school teaching preparation, 38-39, 88-89

Historical sketch, 4

History, 35, 111-113  
 teaching option, 35, 111

Home Economics, 115  
 college of, 48-49  
 cooperative program in child development, 72  
 education, 48, 113-114, 115  
 extension, 48, 114  
 honors program, 49  
 journalism, 121

Honors  
 graduation, 20  
 home economics, 49  
 organizations, 34  
 programs, 116  
 scholastic, 20

Horticulture, Forestry, Landscape and Parks, 30, 116-120

Housing  
 application, 8  
 family student, 12  
 residence halls, 12

Humanities, 120  
 electives, 15  
 university requirement, 15

## I

Indebtedness, 11

Indian area studies, 35, 120

Industrial engineering, 130

Institute, research, 6

Instructional  
 fee, 10  
 media, 25

Instrumental Music Education, 35, 138

Intercollege transfer, 18

Interior Design, Textiles,  
 Clothing and, 48, 168-170

International  
 agriculture option, 33  
 students, 10

Interpreting the catalog, 26

Intramural, recreation, sports clubs, and intercollegiate athletics, 34, 104

Irrigation option, 133

Instructional TV, 25

## J

Journalism and mass  
 communication, 35, 121-124  
 advertising sequence, 121  
 agricultural, 30, 122-123  
 broadcast sequence, 121, 122  
 home economics, 114, 121  
 news-editorial sequence, 121-122  
 science and technical writing 121, 123

Juniors, class rank, 20

## L

Landscape design, 30, 118

Language policy, foreign, 17

Late fee, 10

Latin American area studies, 35, 126

Law, Pre-, 45  
 criminal justice option, 36, 162

Liberal studies core requirement, 15

Library  
 H.M. Briggs, 25  
 film, 25

Lifelong Learning, Division of, 22

Linguistics, 94

Living and Study Abroad Program, 35  
Loan funds, student, 13

## M

Machine design engineering, 136  
Majors, minors, options (listing), 20-21  
Management  
  park, 118-119  
  restaurant, 147-149  
Married student housing, 12  
Mass Communications and Journalism, 121-124  
  speech, 36, 165  
Mathematics, 35, 126-129  
  teaching option, 35, 128  
  university requirements, 15  
Mechanical Engineering, 42, 129-132  
Mechanized Agriculture, 30, 132-133  
Media, Instructional, 25  
Medicine, Pre-, 45-46  
Microbiology, 30, 35, 134-135  
Military science, 35, 135-137  
Minnesota-South Dakota reciprocity agreement, 8  
Minors, options, majors (listing) 20-21  
Morrill Act, 4  
Mortuary, Pre-, 46  
Music, 35, 137-142  
  choral, 35, 138  
  education, 35, 139  
  general, 35, 137  
  instrumental, 35, 138  
  merchandising, 35, 138  
Musical organizations, 34, 137

## N

Natural Sciences, university requirements, 16  
News-editorial, journalism, 35, 121-122  
Non-degree courses, 18  
Non-major programs, 36, 44  
Non-resident students  
  no previous college, 8  
  transfer, 8  
  tuition, 11  
No-preference (undecided students), 44  
Nuclear engineering, 130  
Number system, course 26  
Nurse, registered, 145  
Nursing  
  college of, 50  
  continuing education, 50  
  department of, 50, 142-146  
  health science, 50, 110-111  
  students' special fee, 10-11  
Nutrition and Food Science, 48, 146-150  
  chemistry, 71

## O

Options  
  majors, minors and, 20-21  
Optometry, Pre-, 46-47  
Oratory and debate, 34, 165  
Orchestra, 34, 137  
Organization of the university, 5  
Organizations, student, 25  
Overloads, 17

## P

Park management, 30, 118-119  
Pass-fail system, 19  
Performance requirements, academic, 19  
Pharmacy, 150-152  
  College of, 51  
  practice, 152  
Pharmaceutical sciences, 151-152  
Philosophy, 35, 152  
Physical education, 35, 105, 106, 107-108  
  for coaching, 105  
  health and recreation, 105, 106  
  minor, 105  
  university requirements, 14  
Physical sciences university  
  requirements, 15, 16  
Physical therapy, 35, 105, 106, 108-109  
Physics, 35, 153-155  
  general, 35, 154  
  professional, 35, 154  
  science teaching, 35, 154  
Placement service, 24, 39  
Planning, 155-156  
Plant Science (agronomy, crops,  
  entomology, plant pathology,  
  soils), 156-159  
Political Science, 35, 159-161  
  teaching option, 36, 159  
  general, 36, 160  
  public administration, 36, 159  
  pre-law, 36, 159  
Power and machinery, 42, 57  
Preparation for teaching, 38-39  
Pre-professional curricula, 44-47  
  architecture, 42, 99  
  areas of study (listing), 21

arts and science, 35  
chiropractic, 44-45  
dental, 45  
forestry, 30, 47, 120  
law, 45, 159, 162  
medicine, 45-46  
ministerial, 46  
mortuary science, 46  
occupational therapy, 106  
optometry, 46-47  
veterinary, 30, 47, 170-171  
Printing, 28, 124-126  
  education, 35, 124, 125  
  journalism, 35, 124, 125  
  management, 35, 124-125  
  two-year program, 28, 35  
  vocational, 125  
Probation, scholastic, 19  
Production option, 31  
Professional chemistry, 35, 68, 69  
Proficiency testing, 8  
Program assessment, university, 14  
Psychology, 35, 161-162  
  applied, 36, 161  
  educational, 88  
  preprofessional, 36, 161  
  services, 35, 161  
Public administration option, 159  
Public Health Science, 110-111  
Public recreation, 35, 105, 109-111  
Purposes of the university, 4

## R

Range Science, 30, 61-62  
Re-admission, 8  
Reciprocity, 8  
Recreation, Public, 105, 109-111  
Refunds, 10-12  
Refused status, 19  
Regents of Education, 5  
Registered nurse program, 142  
Registration, 17  
Religion, Philosophy and, 35, 152-153  
Rent, Room or Residence hall, refunds, 12  
Repeating a course, 19  
Requirements  
  academic performance, 19  
  admissions, 8-10  
  biological sciences, 16, 30  
  college & major field, 16  
  communications, 14-15  
  degree, 14  
  English skills, 10, 92  
  entrance, 10  
  foreign language, 17  
  general degree, 14  
  graduation, 14-16  
  humanities, 15  
  liberal studies core, 15  
  mathematics, 15  
  natural sciences, 16  
  nursing, 142-143  
  over-all university, 14-16  
  physical education, 14  
  physical sciences, 15, 16  
  residence, 8, 10, 12  
  scholarship, 13  
  social sciences, 16  
Research  
  program, 6  
  institutes, 6  
Reserve Officer Training  
  Program, 55-56, 135-137  
Residence hall, 11  
  advanced payment, 11  
  telephone rent, 11  
Residency requirements, 8, 10, 12  
Responsibility, student, 17  
Restaurant Management, 35, 48, 148-149  
Retailing option, 48, 167, 168-169  
Room and board, 10  
Room rent refunds, 12  
Rural Sociology, 30, 162-164

## S

Scholarships and awards, 13  
Scholarship requirements, 13  
Scholastic  
  honors, 20  
  probation, 19  
Science option, 31  
Science and technical writing,  
  journalism, 35, 121, 123  
Semester  
  calendar, 2  
  credit hours, 14  
Seniors  
  class rank, 20  
  graduate credit for, 23  
Shop, engineering, 100  
Social Sciences, 16  
Social Science university requirements, 16

Sociology, 35, 162-164  
  criminal justice, 36, 162-163  
  general, 36, 162  
  human services, 36, 162-163  
  personnel services, 36, 162-163  
  social work, 36, 162  
  teaching, 36, 162  
Soils Science, see plant science, 156, 157  
Sophomore class rank, 20  
Spanish, 35, 98  
Special workshop courses, 22  
Speech, 35, 164-166  
  and drama activities, 164-165  
  communication, 36, 165  
  education, 36, 165  
  general, 36, 165  
  theatre, 36, 167  
State and Federal Support, 4  
Statistics, 167-168  
Student  
  activities, 24  
  affairs, office, division, 23  
  career planning and placement services, 24  
  code, 26  
  family housing, 12  
  fee, 10, 11, 12  
  financial aid, 13  
  government, 25  
  housing, 12  
  loan funds, 13  
  organizations, 25  
  responsibilities, 17  
  transfer, 8  
  union, 24  
Students' Association, 11, 12  
  fee, 11, 12  
Structures and Environment, 42, 57  
Summer session, 22  
  expenses, 22  
  refund, 12

## T

Teacher education, 38-40  
Teaching certificates, 39  
Technical writing option, science and, 121, 123  
Terminal curricula, 27-28  
Terms and vacations, 2  
Textiles, clothing and interior design, 48, 168-170  
Theatre, 36, 165, 167  
Thermal engineering, 130  
Transfer  
  credits, 9  
  intercollege, 18  
  students, 9  
Trip regulations, 17-18  
Tuition, 11  
Two-year terminal programs, 27-28  
  aviation education, 27  
  general agriculture, 28  
  printing, 28  
TV  
  closed circuit, 25  
  instructional, 25

## U

Undergraduate  
  admission, 7-10  
  course numbers, 26  
  course specials, program, 34  
  credit transfer, 9  
University  
  accreditations and affiliations, 7  
  calendar, 2  
  credit, examinations for, 19-20  
  general regulations, 14-20  
  organization, 5  
  program assessment, 14  
  requirements, 7-20  
  student fee, 10, 11, 12  
  Student Union, 24  
  withdrawals, 17  
Unpenalized electives, 18

## V

Veterans Affairs, 23  
Veterinary Science, 171  
Visual Arts, 35, 171-173  
Vocational Agriculture  
  teacher option, 133  
  teacher training, 89

## W

Water resources engineering, 42, 57  
Wildlife and Fisheries Sciences, 30, 173-174  
Withdrawals  
  university, 17  
  failed, 19  
Women's Studies program, 36, 174  
Workshop courses, 22  
Work-study, 13

## Z

Zoology, 30, 35, 62-63, 65-66, 67