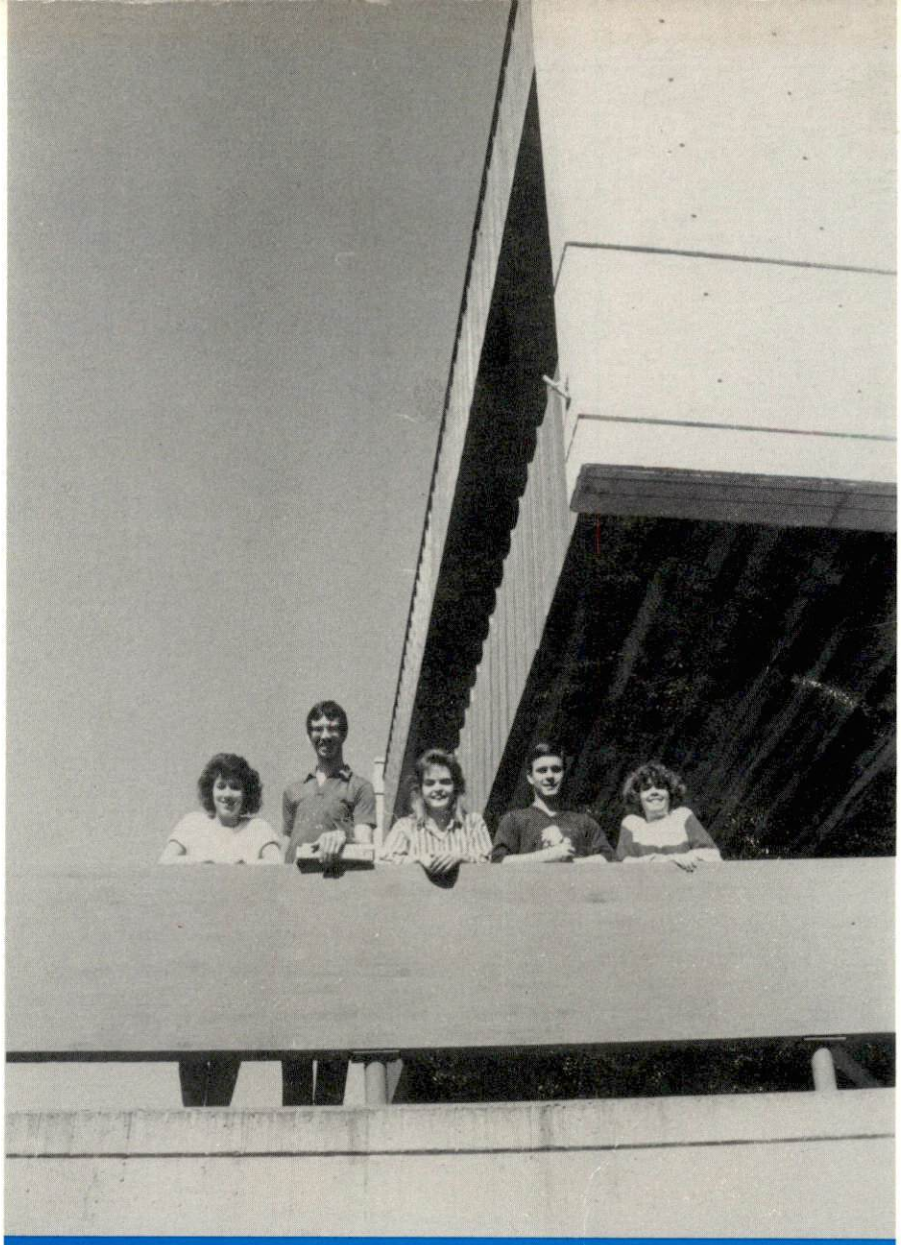

South Dakota State University

1988 - 1990 GENERAL CATALOG

General Catalog 1988-90

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University Calendars

1988 Fall Semester

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

August 29, Monday ..... Registration
August 30, Tuesday ..... Instruction begins
September 5, Monday ..... Labor Day Holiday
September 13, Tuesday ..... Last day to add or drop and adjust final fees
September 23, Friday ..... Last day to submit a graduation card for Fall 1988
October 8, Saturday ..... Hobo Day
October 10, Monday ..... Pioneer Day Holiday
October 11, Tuesday ..... Monday classes
October 20, Thursday ..... First half Fall semester ends
October 26, Wednesday ..... Deficiency reports due in Registrar's Office, 5:00 pm
November 9, Wednesday, ... Last day to drop a course
November 11, Friday ..... Veteran's Day Holiday
November 24-27, Thursday-Sunday ..... Thanksgiving recess
December 14, Wednesday ..... Last day of classes, F'88
December 17, Saturday ..... Graduation, 10:00 am
December 15, 16, 19, 20, 21, Thursday-Friday, Monday-Wednesday ..... Final examinations
December 27, Tuesday ..... Grades due in Registrar's Office not later than 5:00 pm

1989 Fall Semester

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

August 28, Monday ..... Registration
August 29, Tuesday ..... Instruction begins
September 4, Monday ..... Labor Day Holiday
September 12, Tuesday ..... Last day to add or drop and adjust final fees
September 22, Friday ..... Last day to submit a graduation card for Fall 1989
October 9, Monday ..... Pioneer Day Holiday
October 10, Tuesday ..... Monday classes
October 19, Thursday ..... First half of Fall semester ends
October 25, Wednesday ..... Deficiency reports due in Registrar's Office, 5:00 pm
October 28, Saturday ..... Hobo Day
November 2-3, Thursday-Friday ..... South Dakota State Centennial-Holidays
November 8, Wednesday ..... Last day to drop a course
November 10, Friday ..... Veteran's Day Holiday
November 23-26, Thursday-Sunday ..... Thanksgiving recess
December 15, Friday ..... Last day of classes, F'89
December 16, Saturday ..... Graduation, 10:00 am
December 18-22, Monday-Friday ..... Final examinations
December 28, Thursday ..... Grades due in Registrar's Office not later than 5:00 pm

1989 Spring Semester

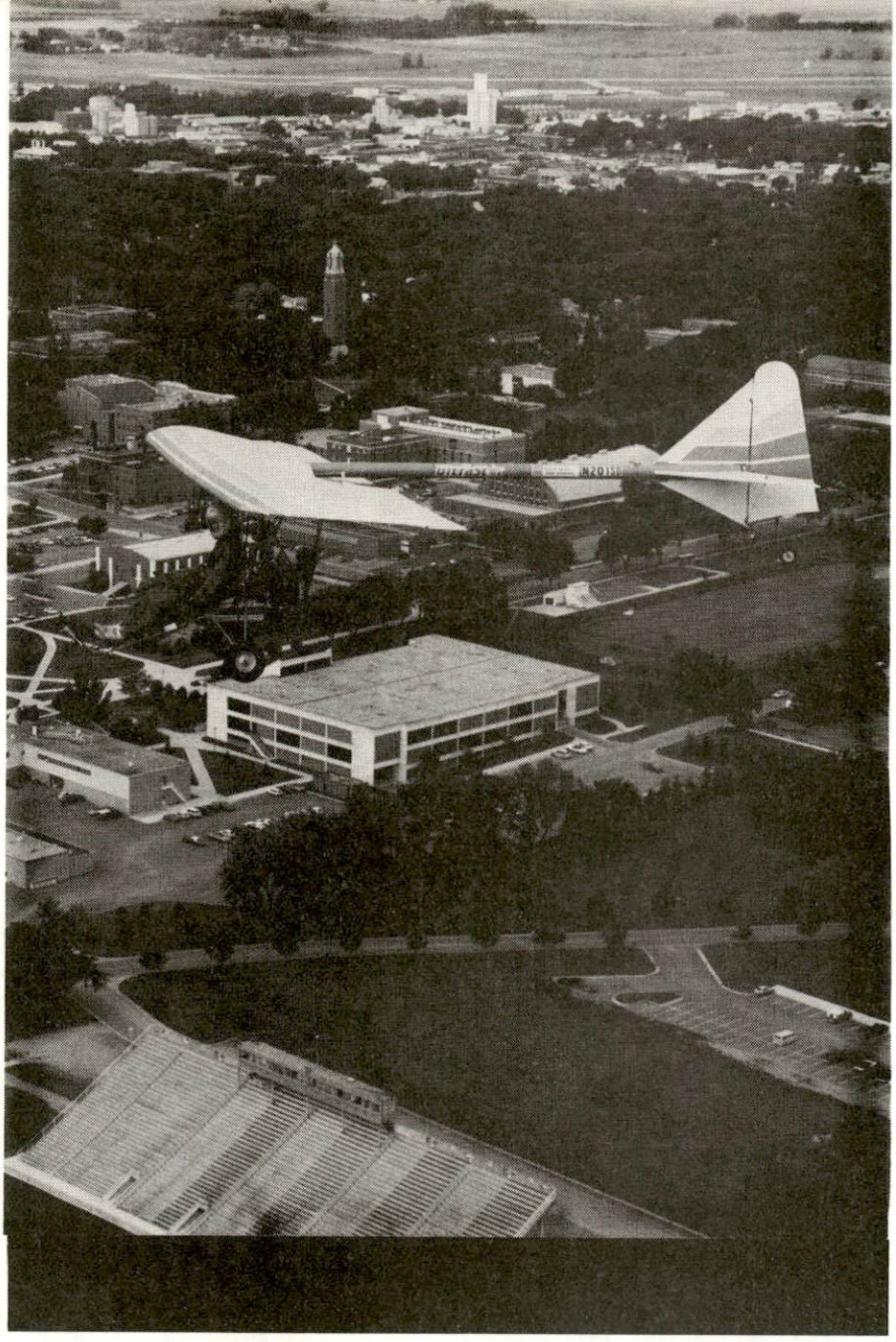
(1 day registration, 73 class days, 5 exam days)

January 11, Wednesday ..... Registration
January 12, Thursday ..... Instruction begins
January 25, Wednesday ..... Last day to add or drop and adjust final fees
February 20, Monday ..... Presidents Day Holiday
February 23, Thursday ..... Monday classes
February 23, Thursday ..... Last day to submit a graduation card for Spring 1989
March 3, Friday ..... First half Spring semester ends
March 6-10, Monday-Friday ..... Spring break
March 9, Thursday ..... Deficiency reports due in Registrar's Office, 5:00 pm
March 23, Thursday ..... Last day to drop a course
March 24-27, Friday-Monday ..... Easter recess
May 4, Thursday ..... Last day of classes, Spr'89
May 5, Friday ..... Assessment/Reading Day
May 6, Saturday ..... 103rd Annual Commencement, 10:00 am
May 8-12, Monday-Friday ..... Final examinations
May 19, Friday ..... Grades due in Registrar's Office not later than 5:00 pm

1990 Spring Semester

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

January 10, Wednesday ..... Registration
January 11, Thursday ..... Instruction begins
January 24, Wednesday ..... Last day to add or drop and adjust final fees
February 19, Monday ..... Presidents Day Holiday
February 22, Thursday ..... Monday classes
February 22, Thursday ..... Last day to submit a graduation card for Spring 1990
March 2, Friday ..... First half Spring semester ends
March 8, Thursday ..... Deficiency reports due in Registrar's Office, 5:00 pm
March 12-16, Monday-Friday ..... Spring break
March 22, Thursday ..... Last day to drop a course
April 13-16, Friday-Monday ..... Easter recess
May 3, Thursday ..... Last day of classes, Spr'90
May 4, Friday ..... Assessment/Reading Day
May 5, Saturday ..... 104th Annual Commencement, 10:00 am
May 7-11, Monday-Friday ..... Final examinations
May 18, Friday ..... Grades due in Registrar's office not later than 5:00 pm



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.

Developments. 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 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 diffusing information on these topics. The South Dakota 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 the candidates for degrees.

Faculty business is conducted by the Academic Senate, an elected body through which faculty express concerns for the welfare 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 Kay Jorgenson (Term expires March 31, 1989) ..... Spearfish
Honorable John Sutton (Term expires March 31, 1989) ..... Pierre
Honorable Max Gruenwald (Term expires March 31, 1991) ..... Milbank
Honorable George E. Maas (Term expires March 31, 1991) ..... Watertown
Honorable E. Steeves Smith (Term expires March 31, 1991) ..... Mitchell
Honorable Michelle Tapken (Term expires March 31, 1991) ..... Yankton
Honorable Roger Prunty (Term expires March 31, 1992) ..... Brookings
Honorable Bonnie Bostic (Term expires March 31, 1993) ..... Sioux Falls
Honorable Pat Lebrun, (Term expires March 31, 1993) ..... Rapid City
David Christensen, Student Regent ..... Madison
Honorable Roger Schinness, Executive Director ..... Pierre

General Administration

Robert T. Wagner, Ph.D., President
Carol J. Peterson, Ph.D., Vice President for Academic Affairs
Richard W. Powers, Ph.D., Vice President for Administration
Barbara Audley, D.P.A., Director, Division of Lifelong Learning and Outreach
Glen Carver, Director of Physical Plant
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, Budget and Personnel

Academic Deans

Edna Page Anderson, Ph.D., Dean, College of Home Economics
David A. Bryant, Ph.D., Dean, College of Agriculture and Biological Sciences
Ernest L. Buckley, Ph.D., Dean, College of Engineering
Rex C. Myers, Ph.D., Dean, College of Arts and Science
Bernard E. Hietbrink, Ph.D., Dean, College of Pharmacy
Darrell Jensen, Ph.D., Dean, Division of Education
James O. Pedersen, Ph.D., Dean, College of General Registration
Margaret J. Hegge, Ed.D., Acting 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 framework 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/her 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/she believes.

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

1. Respects the fellowship of many by following the principle of doing to others as he/she would have them do to him/her.
2. Supports the dignity of fellow human beings in his/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 University's Research Program

The philosophy of the research efforts of SDSU is that of advancing knowledge basic to the teaching and extension programs throughout the entire university. 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.

For information contact the Director of Research, South Dakota State University, Box 2201, Brookings, SD 57007-1998.

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, persons in business 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 persons in 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. 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, Associate 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 with county governments.

Fifty percent of the funds supporting Cooperative Extension educational programs are appropriations to SDSU by the Legislature, and 50 percent come from Federal appropriations.

Extension program emphasis is constantly changing to meet the needs and opportunities of people who help determine 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 managment 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 bachelor's and master's programs in the College of Nursing are accredited by the National League of Nursing.

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

The Chemistry department is accredited by the American Chemical Society.

The dietetic program is accredited by the American Dietetic Association.

The curriculum in Home Economics is accredited by 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 National League for Nursing, the American Association of Colleges of Nursing, 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* — Submit application for admission with $15

non-refundable fee. Payment should be made by check or money order. Former SDSU students are not required to pay the application fee.

(2) *Housing application* — All students must complete the housing application when applying for admission and, unless specifically exempted, all students must enter into housing contracts with the University. Students who have completed four (4) semesters of full-time enrollment at a post-high school educational institution, or who are two (2) or more years beyond high school graduation are automatically exempted from this requirement. All others wishing exemption must submit a written application for exemption, and receive written approval from Housing Office personnel. All students desiring exemption must note their intentions on the housing application. A $50 Advance Housing payment must be submitted with the housing application.

(3) *Health application* — Upon admission to the university, all new applicants are required to submit a health examination form with proof of required immunizations. This form will be sent to the applicant with the letter of admission. All applicants seeking readmission must submit a health examination form if non-attendance 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. High school seniors should also include a copy of their senior course schedule.

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 admission, 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. Contact the intenational 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 transcript and ACT composite score. Transfer students are considered for admission based on their college and high school transcripts.

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 early 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) **Admission Requirements** — New students, including transfer students with fewer 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, business math and general math are not accepted.)
Laboratory Science — 2 years (Courses in biology, chemistry or physics or other science courses 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 available to South Dakota and Minnesota residents only. These openings are limited to specially talented students who are in the upper two-thirds (2/3) of their high school class or who have an ACT composite score of at least 18. 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. **Conditional Admission**
Applicants who are deficient in **one** of the high school course areas outlined in Section I-A may be granted conditional admittance if they:

A. Rank in the top one-half of their high school graduating class, **or**
B. 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**
C. Are selected for an opening in the University's exception group. These openings are available to South Dakota and Minnesota residents only. These openings are limited to specially talented students who are in the upper two-

thirds (2/3) of their high school class or who have an ACT composite score of at least 18. Early application is essential.

If admitted on a conditional basis, you must satisfy the deficient course by completing an appropriate college course in that area. Check with the SDSU Admissions Office regarding the policy for counting these courses toward graduation. (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 the Associate of Arts (two-year) program in General Agriculture is granted if you have met ONE of the following criteria:
   A. Rank in the top two-thirds of your high school graduating class, or
   B. Have an ACT composite score of at least 15.

Students enrolled in two-year General Agriculture who have not met the minimum high school course requirements for admission to 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. In addition, they must also complete 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

IV. **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.

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. Check with the SDSU Admissions Office regarding the policy for counting those courses 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, orientation, life experience, and high school level courses are not accepted for transfer credit. No transfer credit is granted for General Educational Development Tests. Generally vocational courses are not accepted in transfer; however, where specific 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 if the course is equivalent to a specific SDSU course.
   C. Credit earned for college level courses by examination, extension, correspondence, CLEP, 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. Grades for all attempts will be incorporated in the cumulative grade point average.
   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 parallel 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 and will be transcripted with the SDSU equivalent credit and grade. 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. Any transferable grade, whether accepted or not, will be incorporated into the addition of the cumulative grade point average.
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 of admission 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.

Non-Matriculated Students

Those who wish to enroll with a partial load or do not plan to work toward a degree may be classified as Non-Matriculated Students. Non-Matriculated Students must generally meet the requirements outlined for admission of freshmen.

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 encouraged 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.

Non-Native Speakers of English/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 Affairs 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 engineering 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 (minimum TOEFL score is subject to change). 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 fewer 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 ("English as a Second Language: Grammar Review and Intermediate Composition") or English 013 ("English as a Second Language: More Complex Structural Patterns and Advanced Composition"), as determined by your scores on the various portions of the Michigan test. If you obtain less than a B in English 003 or less than a C in English 013, you must take English as a Second Language the following semester. English 023 ("English as a Second Language: Listening and Reading Comprehension") may be required in addition to or instead of either of these courses. If you are placed in English as a Second Language, you are expected to begin to complete the requirement the first semester of enrollment and should not enroll in more than 15 credits including English as a Second Language.
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 Affairs Office.

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

SDSU reserves the right to require advance deposits of estimated tuition, fees and living expenses when warranted by prevailing foreign exchange difficulties.

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 previously attended 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 expendable 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 fees during the regular established registration and payment periods, you will be assessed a late fee of $10 (plus $1 per day/ maximum of $35). If you fail to satisfy financial obligations when due, you will be withdrawn from the university.

Special Expenses for Engineering Courses — Fees are charged for courses in

the College of Engineering ($9.50 per credit hour). Also, an Engineering/Science Lab fee of $12.50 per designated course.

Special Expenses for Nursing Students — Uniforms must be purchased by second year nursing students. Transportation must be provided by the student in Community Health Nursing and selected independent experiences. Students enrolled in nursing major courses are assessed two additional fees each semester when applicable: clinical fee $195; malpractice insurance $25.

Special Expenses for Pharmacy students — Pharmacy majors are assessed a major fee of $195 for semesters 3-9, and $225 for semester 10

General Deposit — If you carry 9 or more credit hours or are living in a residence hall, you must pay a $60 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, financial aid, and not to student organizations.

Tuition, Living and Other Expenses

(As of April 1, 1988)

All charges listed are subject to change pending Regents action

	Resident	Non-Resident
Tuition — undergraduate on-campus per semester credit	$35.50	$81.00
graduate on-campus per semester credit	$53.00	$104.00
Instructional/Administrative Services Fee per credit	11.15	
University Student Fee — per semester per credit, (limit 12)	11.25	
Board, per semester		
Plan 1	$383.50	
Plan 2	$415.00	
Plan 3	$724.75	
Residence Hall Rent, per semester (includes phone)		
All halls (double room)	$409.00	
Single occupancy	$551.00	
Books and supplies (estimate), per semester	$210.00	

TYPICAL EDUCATION EXPENSES (ONE SEMESTER) FULL TIME UNDERGRADUATE

Tuition — 16 credits	$568.00	$1,296.00
University Student Fee — health service, Union, Students Association, Instructional	$313.40	
Books and supplies	$210.00	
Board	$450.00	
Residence hall rent	$409.00	
	$1,950.40	$2,678.40

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.)	$60.00	$60.00
First time international student charge		$75.00

Special Fees are charged for courses in the College of Engineering: Education Fee $9.50 per credit hour; and an Engineering/Science Lab Fee of $12.50 per designated course.

Registration day each student makes a partial payment of charges ranging from $75 to $1,100 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 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 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 and postmarked on or before June 30 for Fall Semester and November 30 for Spring Semester in order to avoid a monetary penalty. University residence hall facilities rent for $818 - $1,102 per academic year. Usually, two students are assigned to each room. However, several rooms are available for rent 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 USU 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 release from the residency requirement is postmarked 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 postmarked 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 $137-$205 per month. Rent for the two-bedroom apartments is $232 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
FY1988

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.

Summer Session Refund

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 any 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 Aids 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**

There are more than 1,000 scholarships awarded annually to SDSU students. A single scholarship application, available from the SDSU Financial Aids Office or from your high school, must be returned to the Financial Aids Office by January 25th for priority consideration for the academic scholarships.

There are several renewable (scholastic performance required) academic scholarships. These include: Dan Bocklund Memorial; Stephen F. Briggs; Dick Clarin; Earl F. Ferguson; Philip and Viola May; Henrietta Nichols; LaVerne Noyes; and National Merit Semi-Finalists. South Dakota National Merit Semi-Finalists are also eligible for the South Dakota Superior Scholar Scholarship program.

Annual scholarships are awarded by every college and for every grade level. In fact, the senior and junior classes receive the most scholarships. Some of the major annual scholarships include: Amdahl, Butler, Clarkson, and departmental awards.

Among the major scholarships with specific criteria are: Wilbur Allen Endowment, providing tuition and fees plus books for wildlife and fisheries majors and can be reawarded for additional semesters; Larson Manufacturing Building Trades Scholarship for first year students with a parent employed in the building trades; guaranteed scholarships for high school valedictorians; Henrietta Nichols for Yankton Sioux members; and LaVerne Noyes for direct descendants of an honorably discharged veteran of World War I.

Talent and participation scholarship awards are available by contacting the specific areas:

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.

Theater: Theatre Department, SDSU.

II. **State Incentive Grants**

III. **Pell Grants**

IV. **Supplemental Educational Opportunity Grants**

V. **Health Profession Loans (Pharmacy)**

VI. **Perkins Loans**

VII. **Work Study Program**

VIII. **Nursing Student Loans**

IX. **Guaranteed Student Loans**

X. **PLUS and SLS Loans**

XI. **Governmental Agency Student Financial Aid**

XII. **Student Employment**

XIII. **Veterans Assistance**

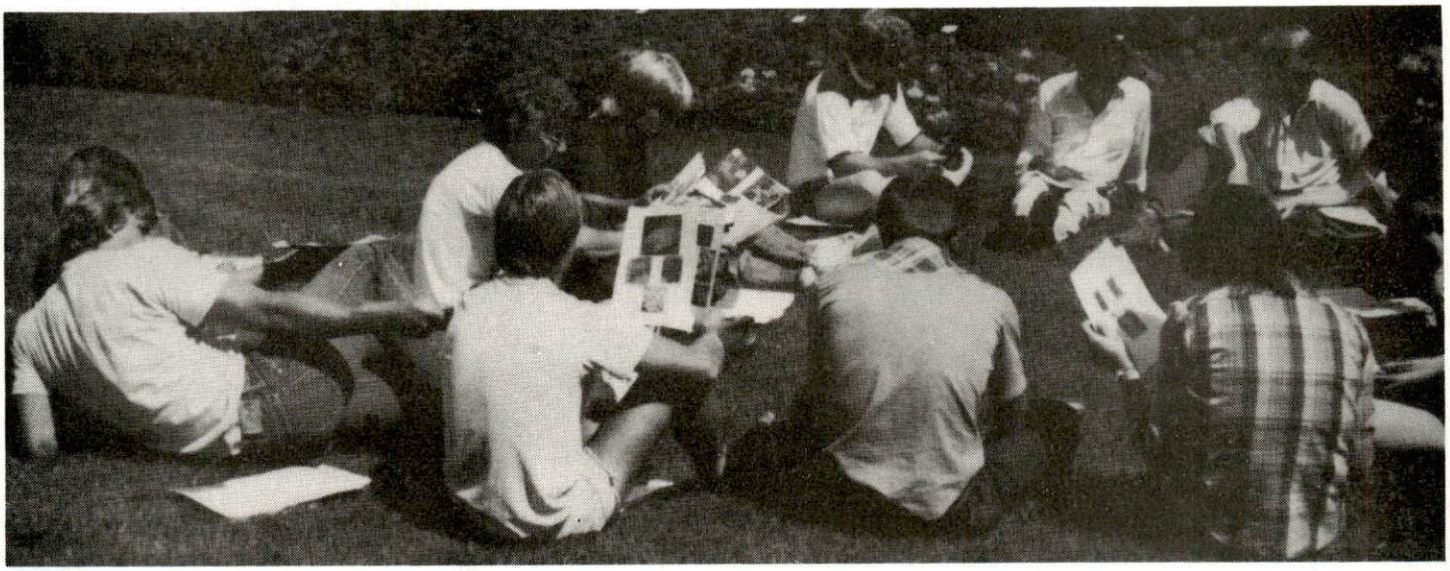
SDSU is fully accredited for GI Bill educational assistance for qualified veterans.

XIV. **Serviceman's Opportunity College (SOC)**

South Dakota State University has been designated as an institutional member of Servicemembers Opportunity Colleges (SOC), a group of more than 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).

XV. **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 more than 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 for the university core curriculum.

University Assessment Program

The Board of Regents has 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 majors 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.

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, Ex, or P 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.) Credits earned by examination are not counted as resident credit unless an exception has been made because of special program features.

4. Completion of University core requirements as described below.

5. Completion of all college and major field requirements.

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.

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 freshmen (fewer 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 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 Western Civilization to 1650
- 122 History of Western 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
- 313 Great Philosophers
- 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

Applied 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

Music 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 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
- 200 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
- 151 U.S. History to 1877
- 152 U.S. History since 1877
- 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

Courses outlined under the college and major field curricula must be completed 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 at entry or any subsequent catalog until they graduate. 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 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, completes a "Credit by Examination" application, and pays the recording fee. 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 in writing by the dean of the college and presented to the Registrar at the time of registration. In general, courses will not be given to fewer than 10 students, unless there is some special reason for doing so. Instructors will cancel courses with low enrollment or for other reasons, only with the approval of the dean of the college concerned.

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, Room 200. 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 "Refund" section 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 for the trip. 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 personal 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 and fee 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. Full-time employees must file with the Registrar each semester the proper request form to obtain a waiver of tuition and fees. Other special departmental fees are assessed to employee auditors. Fellows, graduate assistants, research and teaching assistants will not be charged tuition to audit a course, but will be assessed general university/activity fees, instructional fees and special departmental fees.

Auditing courses by graduate and undergraduate students must be a matter of record. **Registration for audit may be accomplished only after registration day by add slip procedure.** A report of Satisfactory (AUP) or Failure (AUF) 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 the 20 hour rule for overloads except where prohibited by organization regulations. **Audit courses are not counted in calculating undergraduate or graduate full-time student 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, Ad 208, for official recording.

2. Courses may be added and crosslisted course prefixes changed during the first 10 class days each semester.

3. Courses may be dropped without charge during the first 10 class days. Drops after that date are not entitled to refund. **Grades for dropped courses:** a) Students will be allowed to drop courses for the first thirty class days (30) of the Spring and Fall Semester with nothing being recorded on their transcripts. Thereafter, until ten (10) class days after midterm, a "W" will be recorded on the student's permanent transcript indicating a late drop. Thereafter, the present policies concerning an individual drop from classes would remain in effect allowing for an individual drop only in extenuating circumstances. Similar proportional dates would be established by the Registrar's Office for summer, interim and other courses taught outside of the normal nine-month academic year.

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 an 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.

Intercollege Transfer

To transfer from one college to another within the University, you need a Between College Transfer Form (BCT) 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 or transcript 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; AUP — Satisfactory-Audit; AUF — Failure-Audit; EX — Satisfactory-Exam; P — Pass-Pass/Fail; TR — Credit given by transfer work; CR — Credit; 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). WP — Withdrew passing; WF — Withdrew failing; X — Grade not reported by instructor. Value same as "F" until removed. W — Withdrew; IP — In Progress; I — Incomplete, is a report indicating if for reasons beyond the student's control, a student cannot finish the required work in a course, the work completed is of passing grade, and is deemed practical for the student to complete the subject without repeating it in a regular class, 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 by the Vice President for Academic Affairs. However, when the student has graduated and the record is officially closed, an instructor can no longer change a grade.

Grade Points and GPA: Grade points are related to grades as illustrated in these examples:

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 divided by 17 = 2.23

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 (graded A,B,C,D,X,F or WF) are included even though, because of repetition of work some of them may be considered cancelled. Note: This excludes I, AUF, AUP, CR, EX, IP, P, TR, W, WP 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 calculate in the cumulative grade point average. You must notify the Registrar's Office when a 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 (P or F) will be recorded on your permanent record. A grade of "P" 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 in the graduation ratio. An "F" grade will calculate in the computation of the semester or the cumulative grade point average.

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.

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. Suspended — You will be "suspended" 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 suspended status twice, you will not ordinarily be permitted to enroll again.

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 suspended readmission status cannot be removed by summer school.

C. To appeal a suspended 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.

Available Majors, Minors and Options

Preprofessional areas of study

Key to colleges administering individual curriculums

A&S	=	College of Arts & Science
ABS/Ag	=	College of Agriculture & Biological Sciences, Agriculture Curriculum
ABS/BS	=	College of Agriculture & Biological Sciences, 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

• = option (area of emphasis, concentration or specialization within a major).
* = Education curriculum available with these majors as preparation for teaching secondary education.

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 receive credit through a variety of testing programs.

Credit may 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. The Foreign Language, Mathematics and CLEP exams are administered at SDSU, the other programs are administered only through national testing centers. A fee is charged for administration of the CLEP tests.

If a standardized exam is not available in the subject area you wish credit, a special exam may be established to allow 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 should be covered, and what credit is expected. Laboratory courses or mixed lecture-laboratory courses must have the consent of the instructor.

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. 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.

If credit is accepted by examination the permanent record will show: course name — credit by examination, with an EX 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.

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

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

A grade given at or transferred to this university may not be raised by examination for university credit.

For information about credit through any of these programs contact the Assessment and Testing Office in Room 315 in the Administration Building.

South Dakota State University cannot guarantee that credit earned via test at SDSU will transfer to other institutions. Even though SDSU has made every effort to set cut off scores at appropriate levels, each institution develops their own procedures for accepting credit by test. In some cases a certain test or score level acceptable at SDSU may not qualify a student for credit at another institution.

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 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 their diploma.

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 August and is characterized by innovation and responsiveness to your needs. Classes are comfortably sized and 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 and Institutes 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 Master's 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.

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

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 and must be filed prior to taking the course. 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 provides services and activities which are designed to help you gain the greatest benefit from your university education. The following departments and programs are included in Student Affairs: Admissions, Financial Aids, Food Service, Health and Counseling Services, International Student Affairs, Records, Students Activities, Student Housing, and Veterans Affairs. If you have questions or need information about any of these areas, contact the Dean of Student Affairs office in Room 314, Administration Building, telephone number (605) 688-4493. The specific programs and services offered by these departments are listed below and elsewhere in this catalog.

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 maintains official records on enrollment, grades, credits, and degrees conferred; administers registration and assesses tuition and fees; prepares and sends transcripts when written requests are received from students; prepares semester schedules and assigns classrooms, supplies reports and analysis of enrollment, grades and other scholastic matters; coordinates with Deans the procedure for clearing candidates for graduation and submitting candidate lists and related graduation communications. The Registrar's Office is in Room 208, Administration Building, Box 2201, telephone number (605) 688-4121.

Financial Aids — Student financial assistance programs, including federal and state need-based financial aid, scholarships, and governmental agency awards (BIA, Veterans Administration, Vocational Rehabilitation, etc) are administered by the Student Financial Aids Office in Room 106, Administration Building, telephone (605) 688-4695.

Veterans Affairs — SDSU is a fully accredited university to provide GI Bill educational assistance for qualified veterans and dependents. Eligible dependents and veterans should contact the Veterans Service office, Room 108, Administration Building, South Dakota State University, Box 2201, Brookings, SD 57007, telephone number (605) 688-4700, 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. Please direct questions about this program to the Registrar's Office, Room 208, Administration Building, South Dakota State University, Box 2201, Brookings, SD 57007-0498.

If you are interested in social activities you are invited to become a member of the SDSU Vets Club.

Counseling Service — SDSU provides an on-campus counseling service offering personal, confidential assistance to students. Adjustment to college life, personal decision making, conflict resolution, self-concept issues, and goal setting are common issues which the Counseling Center staff is prepared to address. These and other services are provided by appointment through one-to-one counseling or group counseling. Special services on stress management, eating disorders, sexuality concerns, and abuse issues are available. Additional services are provided by referral when necessary. Call 688-6146, West Hall 112, for further information.

Health Service

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

Department of Student Activities

The Department of Student Activities 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, Print Shop, Leisure Skills Center, Information Exchange, Student Enrichment Programs Office, Central Reservations Office, and University community check-cashing. Student offices include University Program Council, Hobo Day Committee, COLLEGIAN/JACKRABBIT publications, Interfraternity Council, Panhellenic Council, Student's Association, Student Federation, S.A. Lawyer, and Off-Campus Housing.

The Department of Student Activities Student Enrichment Programs Office coordinates the activities sponsored by the University Program Council and assists with the Harding Distinguished Lecturer Series and Fine Arts Committee. Advance tickets for such events may be purchased at the Information Exchange. The Student Enrichment Programs 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 Reservations (room/space reservations).

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 more than 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.

Experiential Education Program

The University's Experiential Education (Field Experience, Cooperative Education and/or Internships) Program provides the student an opportunity to integrate classroom study with periods of planned and supervised professional work experience with cooperating business, industrial, and governmental agencies.

Experiential 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 experiential 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 includes experiential education, 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 undergraduates 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.

Academic Support Services

Instructional Media

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

Primary media services are located in Pugsley Hall room 101. Service functions in Pugsley include the film library, equipment services, photo lab, graphics, and production services. In addition to the Pugsley service center, the Dial Access Center is located in Nursing-Home Economics and the IMC operates a satellite support center in the core of the Rotunda for Arts and Science.

The film library is a college level collection of video tapes and films. The collection, which includes more than 5000 items, also includes audio tapes, records, filmstrips and other types of media.

Equipment service provides for classroom delivery, extended assignment and repair of most major kinds of audio visual equipment. The latest in technology including video, multi-image and computer projection are available.

The photo lab is a full service lab with in-house processing of all black and white services as well as production and processing of color slides. The photo lab processes slide films requiring E-6 processing and contracts for color print services.

The graphics section boasts the latest in computer graphics. High resolution slides and transparencies along with other graphics make this service one of the most complete in South Dakota.

Production services include video tape production and duplication in addition to traditional audio production services. Slide tape programs, multi-image, and other specialized production services are available.

The Dial Access Center, located in the Nursing-Home Economics Building, services as an electronic instructional resource center. Audio and video programs made available by instructors are programmed for independent review by students.

The Rotunda for Arts and Science is a modern rear-projection classroom building. Audio visual materials are rear projected onto large glass screens. IMC personnel support users and operate a satellite service center in the Rotunda.

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, Nursing/Home Economics, Ag Engineering, and the Briggs Library.

The Computer Terminal 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 400,000 bound volumes, 395,000 government publications, and 330,000 items on microfilm, microfiche, or microcards in addition to newspapers, maps, and pamphlet materials. More than 3,400 periodicals titles are received currently. Photocopying equipment, microcomputers, 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.

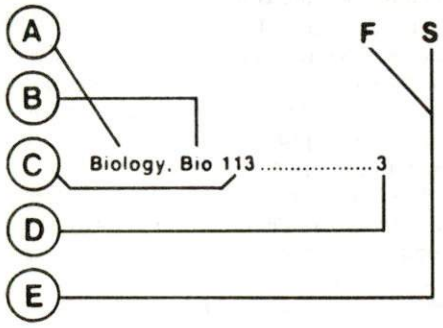
Complete details concerning disciplinary procedures and regulations pertaining to residence halls, parking and traffic, student organizations and activities will be found in the Student Policies Manual.

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/lecture 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
TBA, 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. A certificate program in Flight Training is also offered to those desiring to prepare for their private pilot license.

The core requirements for the Associate Degree program is 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 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.

Aviation Education (Avia)

Division of Education

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.

General Agriculture

College of Agriculture and Biological Sciences

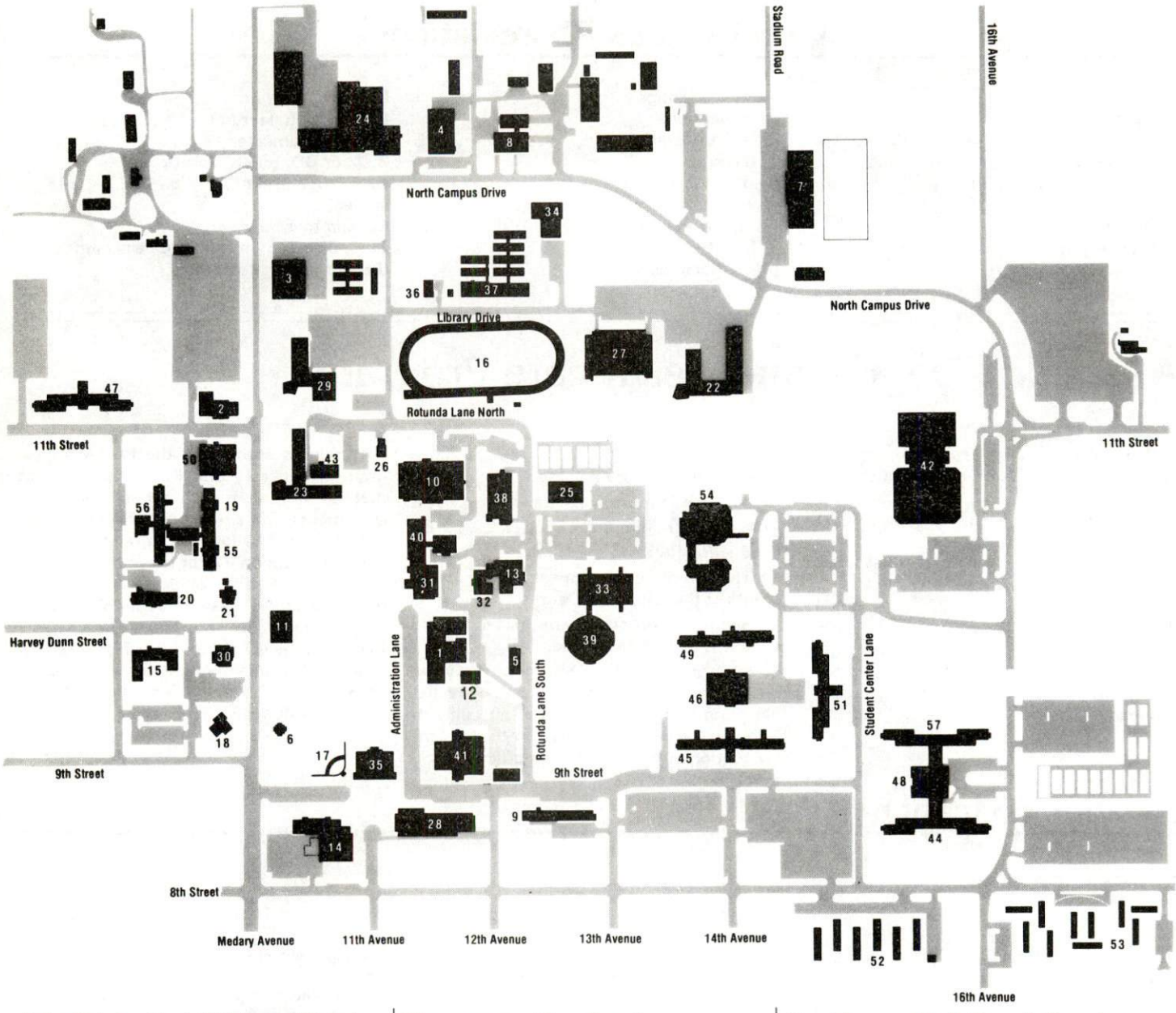
A two-year program is designed for the student who does not find it advisable or possible to enter a regular four-year college program. A typical student in this situation could be one who desires some education but not necessarily four years before returning to the farm or ranch. The core requirements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

	Credits
English	3
Physical Education	2
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.



Administration/Offices/Points of Interest

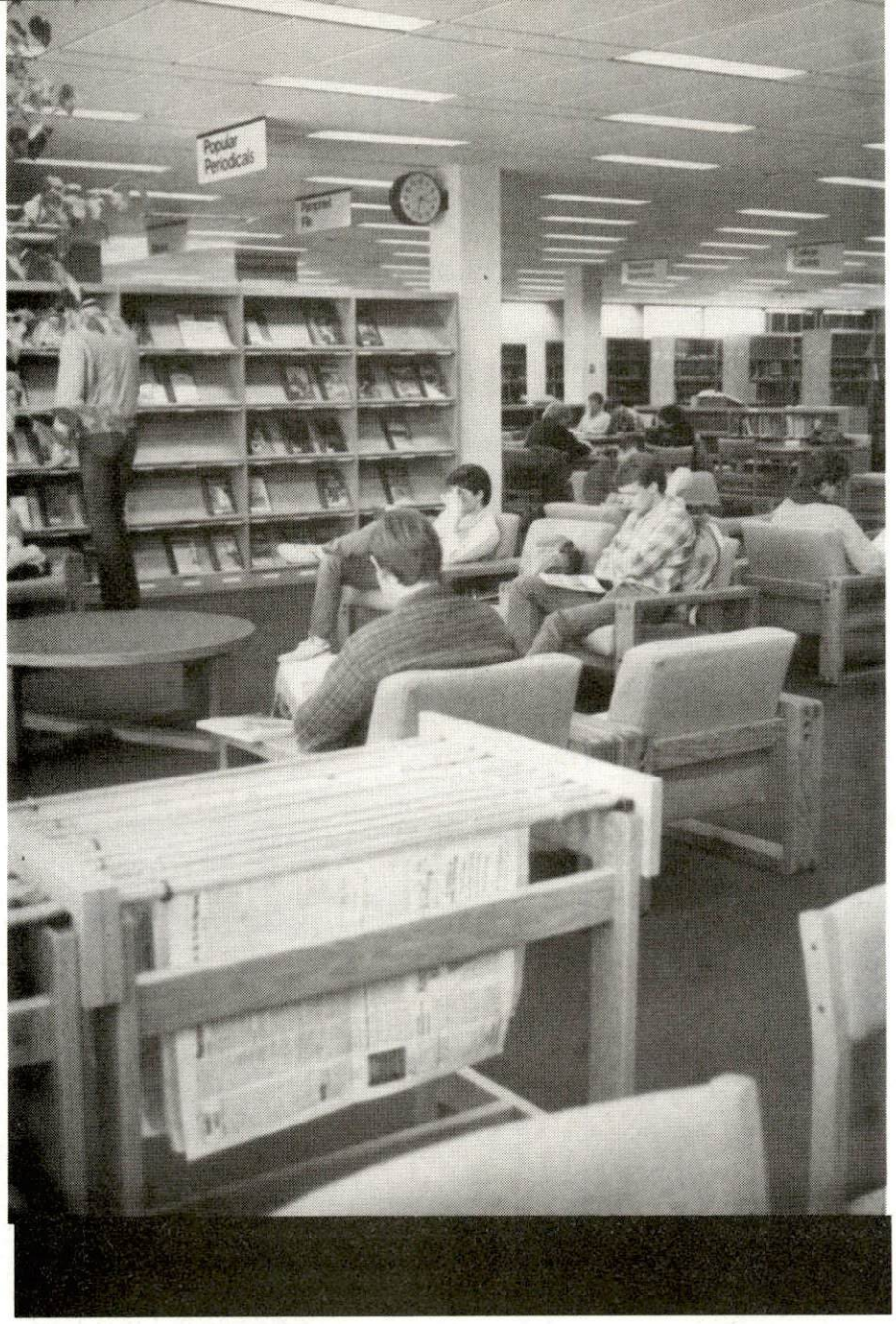
1. Administration Building
2. Agricultural Heritage Museum
3. Agronomy Seedhouse and Greenhouse
4. Animal Disease Research and Diagnostic Laboratory
5. Communications Center
6. Coughlin Campanile
7. Coughlin-Alumni Stadium
8. Foundation Seed Stock Building
9. Harding Hall
10. Intramural Building
11. South Dakota Art Museum
12. Old Horticulture (Ag Communications)
13. Power Plant
14. Pugsley Continuing Education Center
15. Scobey Hall
16. Sexauer Field
17. Sylvan Theatre
18. Tompkins Alumni Center
19. Wenona Hall
20. West Hall
21. Woodbine Cottage (President's residence)

Classroom/Academic

22. Agricultural Engineering
23. Agricultural Hall
24. Animal Science Complex
25. Armory (ROTC)
26. Biology Annex
27. Briggs Library
28. Crothers Engineering Hall
29. Dairy Microbiology
30. Family Resource and Management Center
31. Guilford C. Gross Pharmacy Building
32. Heat/Power Laboratory
33. Home Economics-Nursing
34. Horticulture-Forestry
35. Lincoln Music Hall
36. Physiology Laboratory (Alcohol Fuels Research)
37. Plant Science Building
38. Printing and Journalism Building (includes U.S. Postal Service)
39. Rotunda for Arts and Science
40. Shepard Hall
41. Solberg Hall
42. Stanley J. Marshall HPER Center
43. Wildlife and Fisheries Sciences Building

Residence Hall/Food Service

44. Binnewies Hall
45. Brown Hall
46. Grove Commons
47. Hansen Hall
48. Larson Commons
49. Mathews Hall
50. Medary Commons
51. Pierson Hall
52. State Court
53. State Village
54. University Student Union
55. Wecota Hall and Annex
56. Waneta Hall
57. Young Hall



COLLEGES

Agriculture & Biological Sciences

David A. Bryant, 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 done 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 your 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	Agriculture	Plant Science
Animal Science	Agriculture	Animal & Range Sciences
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	Microbiology
	Biological Science	Microbiology
Park Management	Agriculture	Horticulture,Forestry Landscape and Parks
Pre-Veterinary Science		Veterinary Science
Range Science	Agriculture	Animal & Range Sciences
Rural Sociology	Agriculture	Rural Sociology
Wildlife & Fisheries Sci.	Biological Science	Wildlife & Fisheries Sciences
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, Math 112, or Algebra & Trigonometry, Math 113	3 or 5
Introductory Physics, Phys 101 or Elementary Physics, Phys 111	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 Icthyology, WL 367). Courses in Group I 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 I 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
Animal Nutrition, AS 223	3
Meat: Production to Consumption, AS 241	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
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
Crop & Livestock Insects, PS 293 or Horticultural Insects, PS 295 or General Entomology, PS 305	3
Practical Range Management, Rang 200 or Principles of Range Science, Rang 300	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 since these activities are becoming significant business enterprises. **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, BAdm 360	3
Business electives*	12

*The business electives must be chosen from the following courses: Principles of Accounting II, Actg 211; Personal Finance, BAdm 380; Business Finance, BAdm 310; Business Law, I BAdm 350; Business Law, II, BAdm 351; Money and Banking, Econ 330; Marketing, Econ 353; Agricultural Marketing, AgEc 354; Marketing Management, Econ 452; Statistical Methods, I, Stat 341.

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

Leading to the Bachelor of Science degree

Course	Credits
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, Math 112 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 (see PS)		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		4
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 completed. 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 Sciences.

Activities

Both nationally known agricultural fraternities, Alpha Gamma Rho and Farmhouse, are organized on campus and provide living accommodations. 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, 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 Sciences	4(3,2) S
443	Plant Breeding	Plant Science	(3,0) F (Alt. Yrs.)
	Graduate & Senior Level Courses		
536-636	Molecular & Microbial Genetics	Microbiology	4(4,0) F
523-623	Population Genetics	Animal and Range Sciences	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
599-699	Biometrical Genetics	Plant Science	3(3,0)
	Graduate Courses		
600-700	Special Topics, for example:		
	Advanced Plant Breeding	Plant Science	
	Advanced Animal Breeding	Animal and Range Sciences	
	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 ares: 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; World Crop & Soil Resources, PS 433; 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 C. 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.

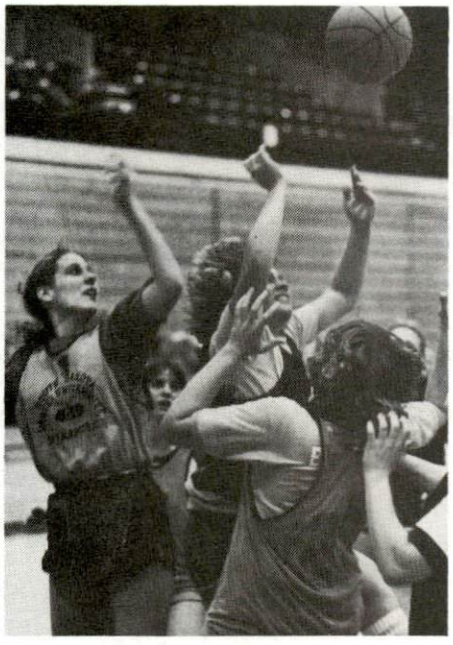
Undergraduate Course Specials Program. (1-5 credits) The College of Arts and Science recognizes the need to make course work relevant and to grant student participation in the formulation of a portion of the university work. Students who wish to study a topic in which a faculty member is competent may 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 in 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 bachelor's 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 re-

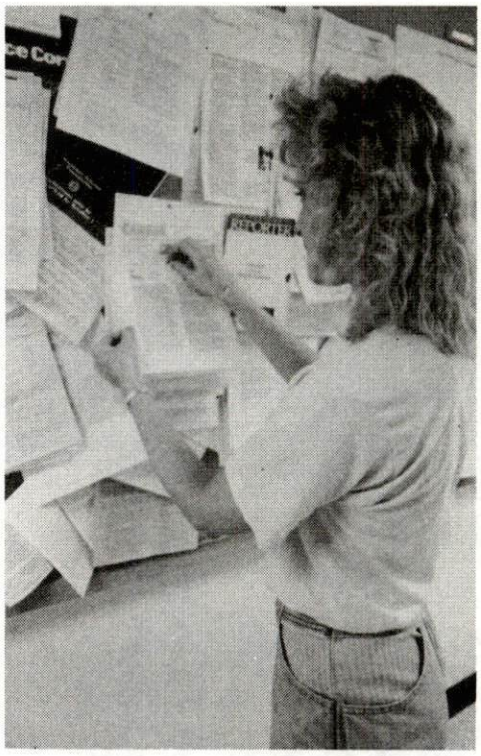
warding and stimulating. Information on available programs may be obtained from the counselor on living and study abroad. Opportunities currently include departmental sponsored study tours, experiment in international living, Junior year abroad, special problems, and field experience. If you intend to 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 Technical Minor	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.)	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.)		Journalism & Mass Communication
Psychology (B.A., B.S.) Psychological Services (B.A., B.S.)	Applied Pre-Professional	Psychology
Religion Minor		Philosophy and Religion
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 Music Education Degree	Semester Hours
Fr Comp, Engl 101	3
Junior Comp, Engl 300	3
Fund of Speech, SpCm 101	3
Fitness & Lifetime Activites, 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 Science (from approved university list including two courses in sequence, list on p.16)	8
Psychology 101	3
History 368 or Anthropology 421	3
Social Sciences (from approved university list, p.16)	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 Languages 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 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)	9
Natural Science (from approved university list including two courses in sequence, list on p.16) Biological Sciences Physical Sciences	6 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

General Requirements

All general university requirements must be met to qualify for the bachelor's 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). Foreign Language may be used to fulfill the Humanities requirement in the B.S. degree. *Social Sciences:* Any course in the following departments; Psychology, Geography, History and Political Science.

(2) 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.

(3) 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 15-16.

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 Western 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.

(4) 40 semester credits of the 128 total required for graduation must be upper division (300 and above) credits.

(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.

(9) Transfer students should note that the College of Arts and Science does not accept transfer grades of "D" or less from other institutions, for credit.

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

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 students to teach 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 your sophomore year.
3. Possess an overall graduation ratio or GPA 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 certificate, 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 taught in 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 student teaching 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 or GPA.
2. Possess a 2.6 overall graduation ratio or GPA in the major area of study.
3. Possess a 2.6 graduation ratio or GPA 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 or GPA.
2. Possess a 2.6 overall graduation ratio or GPA in the major area of study.
3. Possess a 2.6 graduation ratio or GPA in professional education courses.
4. Complete student-teaching with a satisfactory grade and a satisfactory recommendation.
5. Complete the departmental exit exam.

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
Newswriting & 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 1

*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.

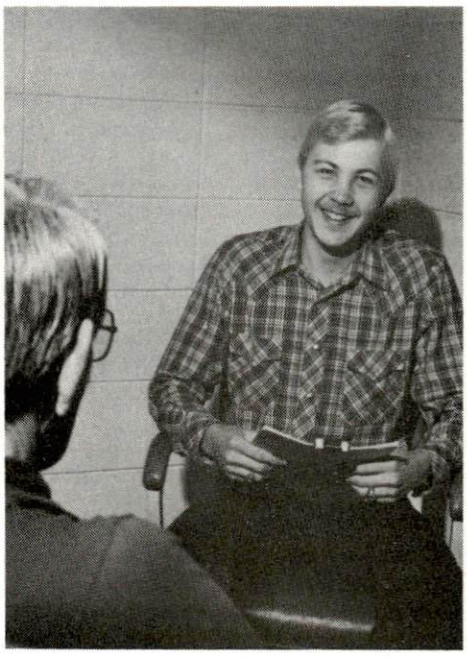
Graduate Study in Education

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 and Human Resource Development
(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

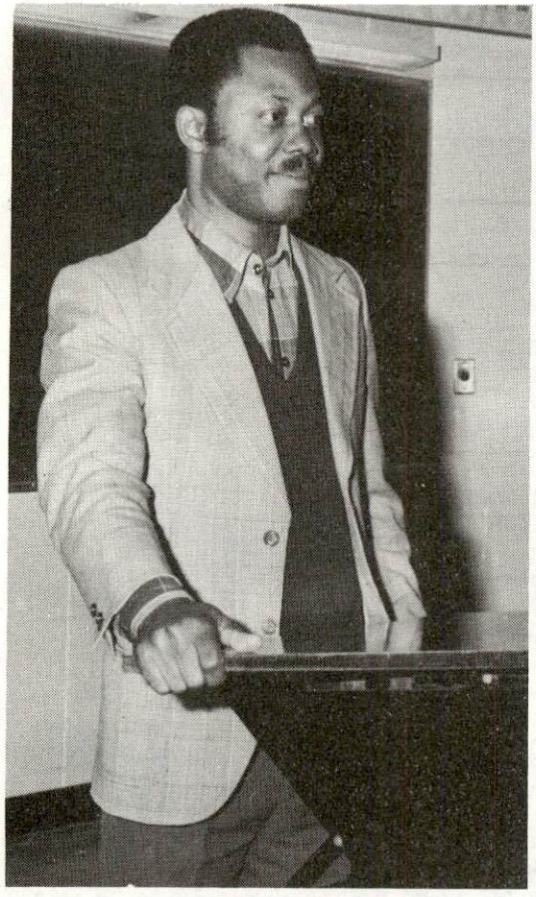
Associate Professor Steinley, supervisor of Undergraduate Teacher Education

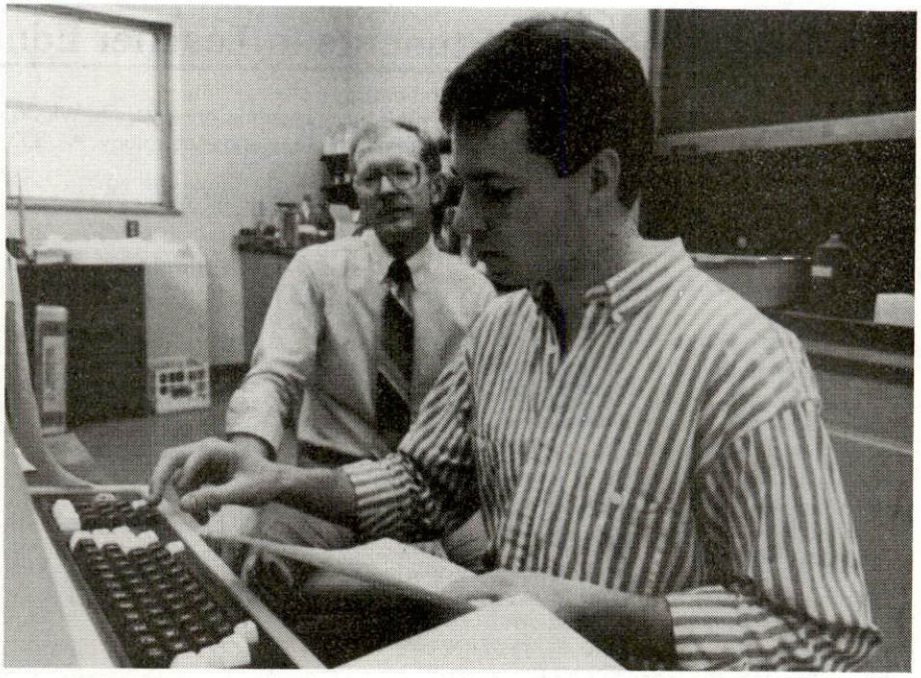
Sophomore Year	**F**	**S**
*Gen Psychology, Psyc 101..	3 or	3
Practicum & Professional Laboratory Experiences, SeEd 287	2 or	2

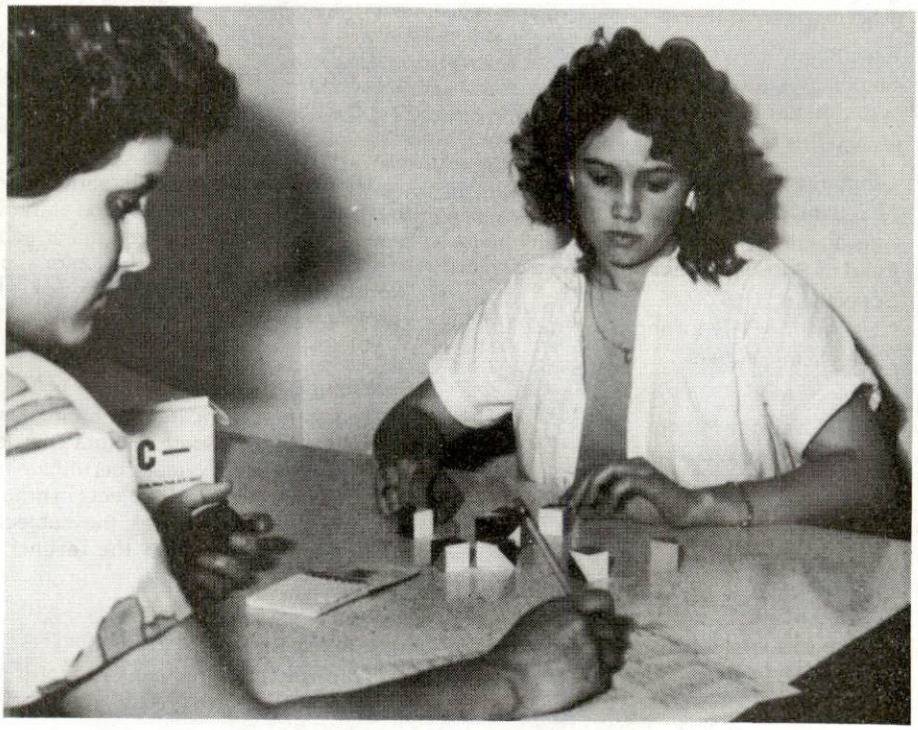
Junior Year	**F**	**S**
Intro to Am Education, EdFn 339	2 or	2
Computers in Teaching, EdFn 385	2 or	2
Ed Psychology, EPsy 302.....	2 or	2
The Teaching of Reading, SeEd 450	3 or	3
History of American Indians, Hist 368 or Indians of North America, Anth 421	3 or	3
Elective: The Exceptional Child, EPsy 303	3	

Senior Year First part of the Semester:	**F**	**S**
Ed Measurements, EdER 415.....	2 or	2
Methods of Teaching in Sec Schools, SeEd 400.....	3 or	3
Classroom Management and Discipline, SeEd 410	2 or	2
Audio Visual Methods & Materials, SeEd 405.....	1 or	1
Second Half of Semester:		
Supervised Student Teaching in Sec Schools, SeEd 488.....	8 or	8

*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.







Engineering

Ernest L. Buckley, Dean
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The College of Engineering offers a variety of courses by a faculty characterized by high 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 are also offered in General Engineering.

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

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 wide range of the engineering and technology programs.

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.

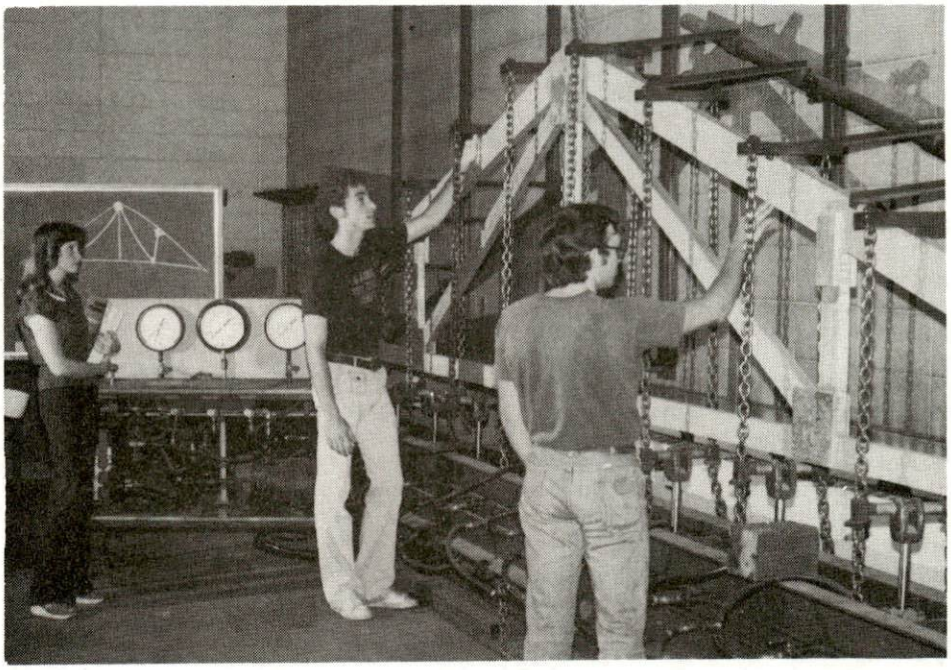
International competition has come to threaten the technical leadership of the United States. It is the responsibility of engineers and technologists to face the challenges in creativity and management that will serve as an example to the rest of the world.

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 should, therefore, 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 estabished 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 (BST) 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 one of the Professional Engineering program. Similarly, if as an engineering student you were to change to a BST program, you will consult with your adviser. After satisfying any deficiencies, the change would be effected.

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 — The minimum grade-point averages for admission to the professional programs 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. Limitations of faculty and facilities will also be used as a basis for determining the number of students to be admitted in any semester.

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.

If you are enrolled in military science courses as a cadet in the US Army or US Air Force ROTC programs, you should plan to extend your undergraduate program to four and one-half years (nine-semesters). ROTC courses can be accepted for substitution for specific course requirements with Dean's permission. Enrollment in the SORD Honors Program would justify a further extension to a full five-year (10 semester) program.

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.

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

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 wil accept transfer credits toward any degrees if the grade received 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 appropriate 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 preceeding 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.

Academic Advising

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 advising 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 Education Plan

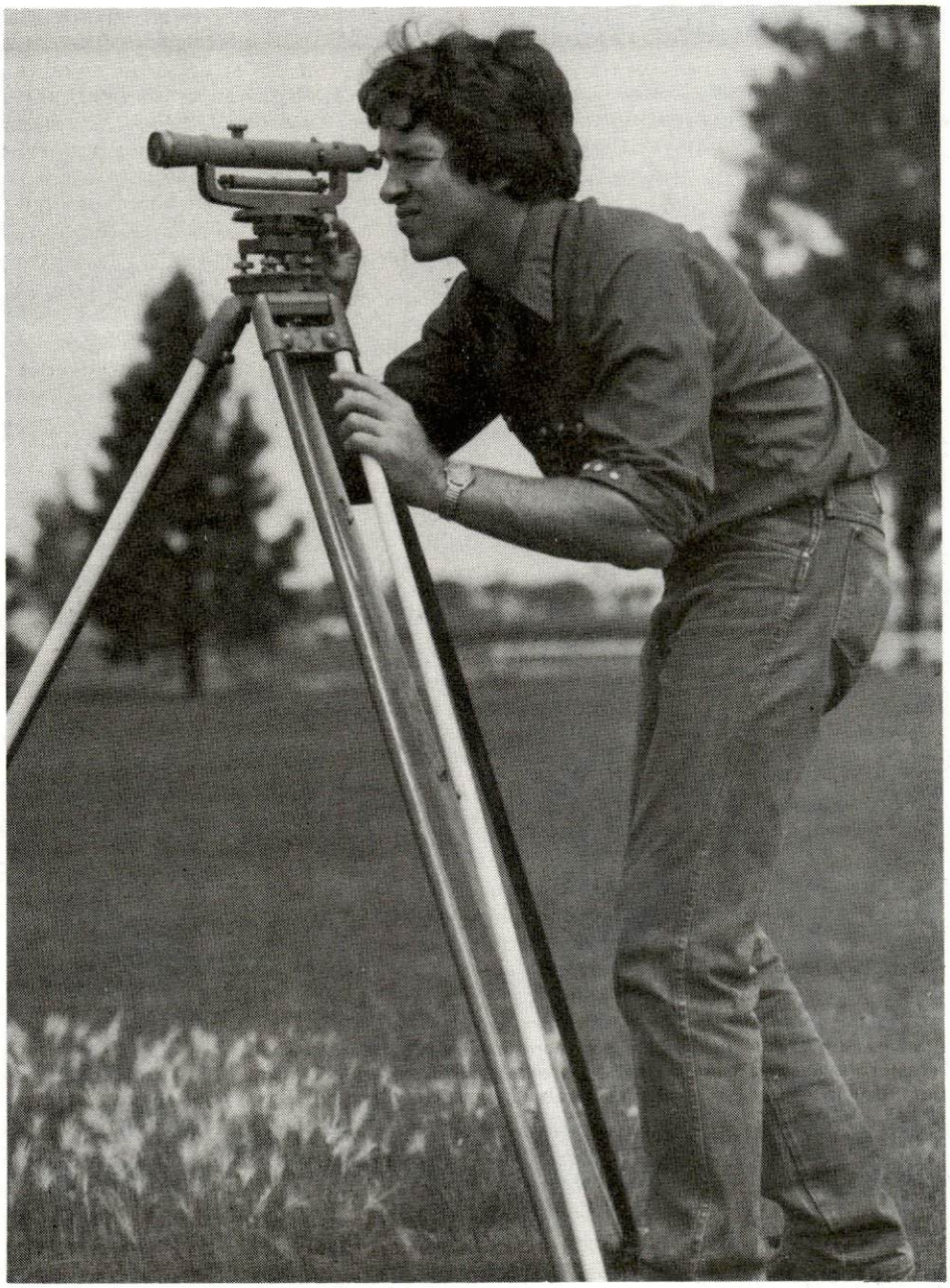
The College of Engineering offers assistance in placing you in cooperative programs with various industries in South Dakota or in surrounding states. Cooperative students gain practical experience in engineering during their college years, gain motivation for greater interest in their studies and provide 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 Electives

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

Freshman Year	**F**	**S**
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

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

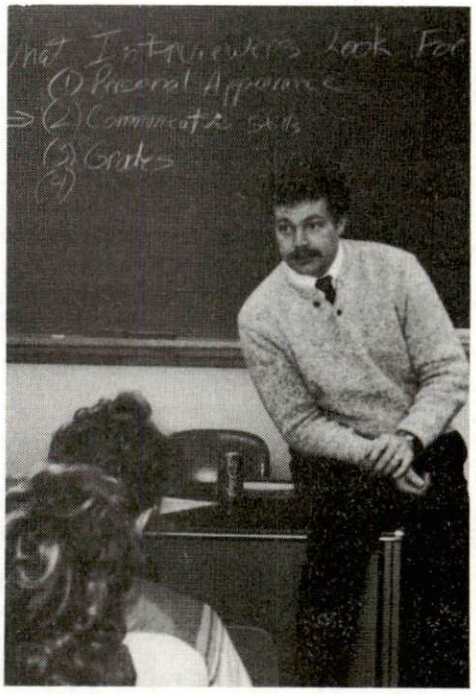
If you wish to qualify for admission to the professional schools of medicine, dentistry, optometry, law or others that require pre-professional education, you would ordinarily start in the College of General Registration. One out of every fifteen entering SDSU freshmen intend to apply for entry to professional 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-Architecture

Because of the nature of the profession and the diversity of academic programs at the graduate level, there are numerous paths that one may take towards becoming a licensed architect. Students are encouraged to consider an educational program that leads to a Masters of Architecture degree from an institution fully accredited by the NCAARB. The Pre-Architecture program at SDSU provides an extensive advising system, and offers the student considerable exposure to computer-aided design, building technologies, community design and economic development, through both academic and internship programs. For the first two years, the core curriculum is consistent with other academic programs in the midwest and uses an interdisciplinary approach to make the most advantage of the university setting. The coursework will fulfill the general degree requirements and include classes in Humanities, Fine Arts, Natural Sciences, and Social Sciences that are necessary to develop the social and aesthetic awareness



that is a prerequisite for an effective practitioner in today's marketplace. Please refer to the suggested curriculum in the General Engineering Section of this catalog.

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:

Freshman Year	**F**	**S**
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 Humanities	6	8
Fitness & Lifetime Activities, PE 100	1	1
Sophmore Year	**F**	**S**
*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.

Freshman Year	**F**	**S**
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 Activities, PE 100	1	1
Humanities Electives	3 or	3
Sophomore Year	**F**	**S**
Chemistry, Chem 222, Fund of Organic Chem & Chem 224	4	4
Intro Biology, Bio 151-153	3	3
Psychology, Psyc 101 Gen Psychology	3	3
Physics, Phys 111-113 Elementary 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.

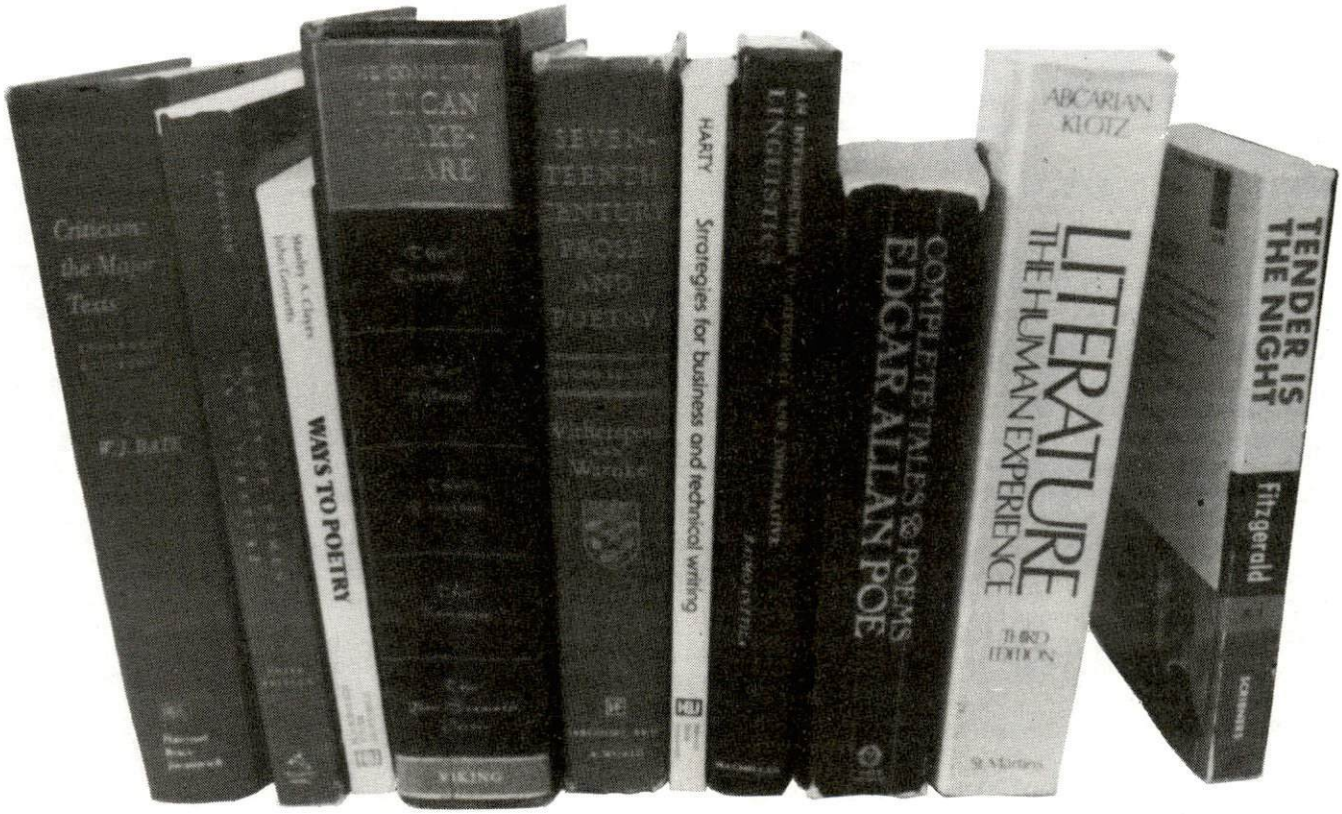
Most of the accredited colleges of optometry, now require an Optometry College Admission Test, prepared and given by the Psychological Corporation at least three times each year. Your Pre-Optometry adviser can give you information on the Optometry College Admission Test, when it is given, and assist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

Freshman Year	**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
Sophomore Year	**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, PolS 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

Our pre-professional program is administered in the College of Agriculture and Biological Sciences. This is Pre-Veterinary. Pre-Veterinary studies is arranged by the Department of Veterinary Science. Students in this program are assigned academic advisers from the department of Veterinary Science. A suggested curriculum for this program is given in the College of Agriculture and Biological Sciences section of this catalog.



Home Economics

Edna Page Anderson, Dean
Box 2275A
Brookings, SD 57007-0097

The College of Home Economics is interdisciplinary and has the capacity to prepare males and females for a variety of professional roles. Some majors within the College are directly related to the family and its traditional functions, such as child development and family resource management. With these majors, graduates are primarily prepared for careers in social service or business. Other majors are derived from functions that were traditionally performed by the family but now are often carried out by business and industry. Restaurant management, fashion retailing and interior design are examples of these majors. General programs in the College of Home Economics prepare graduates for employment in formal and non-formal education, home economics communications and community service.

The nucleus of Home Economics is the family ecosystem: 1) the study of the interrelationships of food, shelter, clothing and interpersonal relations as they affect 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 and Family Relations, Home Economics Education, Nutrition and Food Science or Textiles, Clothing and Interior Design.

The College is organized into four departments offering 15 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 service agencies which deal with children and families in adoption and other family-related services; 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.

The Cooperative Programs with Black Hills State College and Dakota State College lead to certification in Elementary Education. Students selecting this option complete the majority of their coursework at SDSU and take additional coursework at DSC or BHSC that leads to eligibility for certification in Elementary Education.

Department of Home Economics Education

Students in this department may major in Education, Extension, or Journalism. All students develop abilities in management, planning, communication, and organization. In addition, courses in each of the major areas provide specialized skills.

Graduates of the Home Economics Education program are certified to teach Vocational Home Economics in grades 7-12, Consumer Homemaking, and Home Economics Related Occupations.

Graduates in the Home Economics Extension major are prepared to work with the Cooperative Extension Service and other adult and/or youth organizations.

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

The minor in Home Management and Consumer Studies prepares graduates for consumer related positions with business or industry.

Department of Nutrition and Food Science

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

Home Economics Curricula

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

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 a Retailing option 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 design studio provides insights and experiences transitional to a career.

Curriculum

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

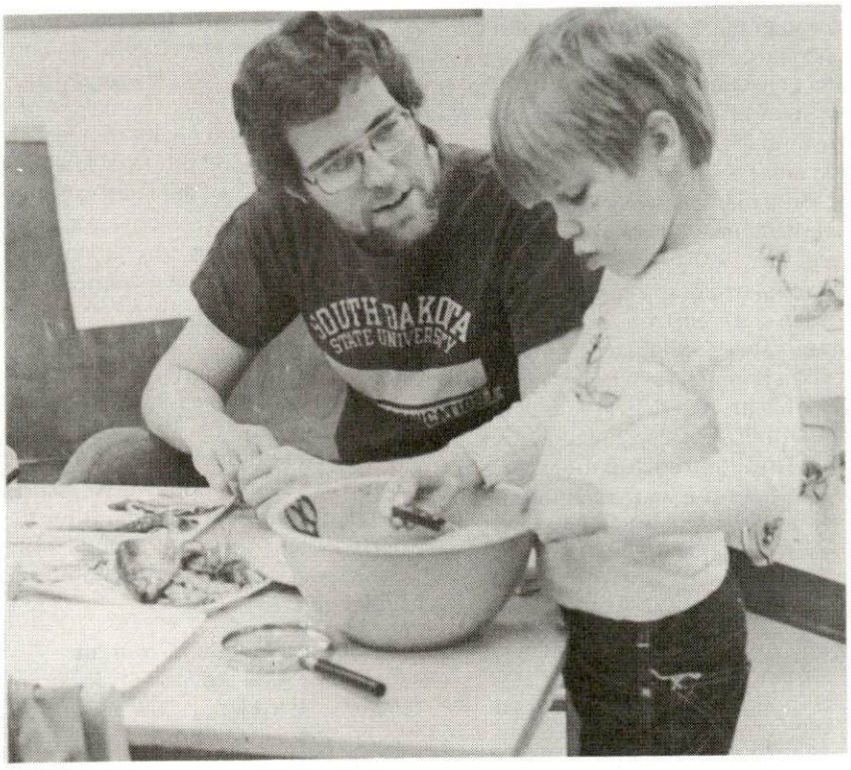
Minor changes occurring in programs are reflected in program guide sheets issued once a year. Entering students must meet the program requirements for graduation listed on the guide sheets, which will reflect the curriculum changes subsequent to the printing of this catalog.

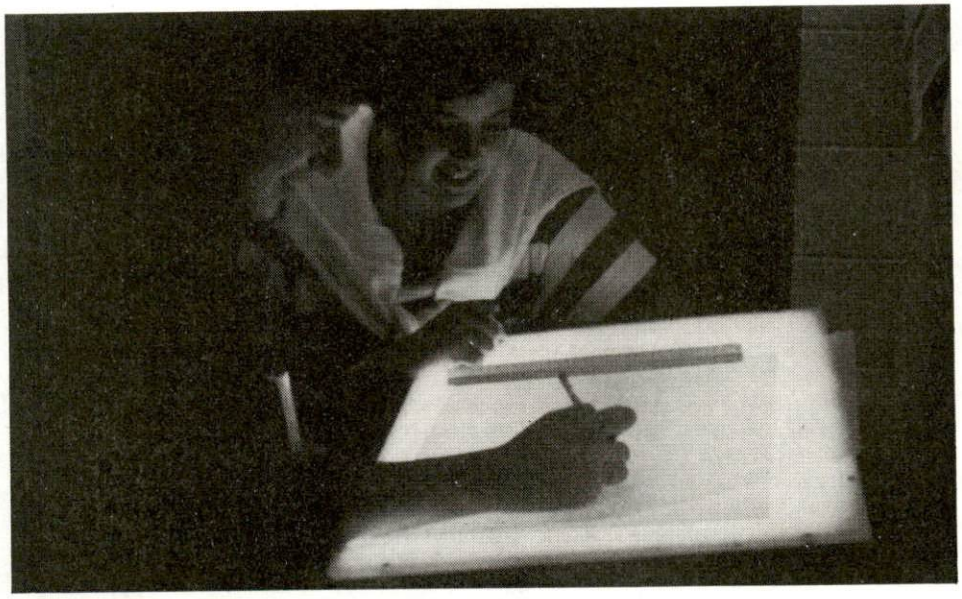
Exploratory courses for those interested in specific majors offered through the College of Home Economics are:

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 Design in the American Home
ID 221 Introduction to Interior Design

Graduate Program in Home Economics

Those pursuing the 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

Margaret J. Hegge, Acting Dean
Box 2275
Brookings, SD 57007-0098

The College of Nursing 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 its programs of study.

1. Provide opportunities for selected men and women: a. to obtain baccalaureate education in the profession of nursing; b. to obtain coursework in health science in the areas of health knowledge, health services, and healthful environment; 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. 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.
6. Encourage and facilitate research in promotion of wellness, in nursing and in health care.

Non-majors are encouraged to select courses in the College of Nursing. Courses contributing to general education include: HSc 102, 212, 432, 443. Students have the option of earning a minor in health science as detailed under Health Science course offerings.

Bachelor of Science Degree in Nursing

A four-year curriculum leading to a Bachelor of Science degree in Nursing is offered. 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.

The undergraduate program at SDSU is approved by the South Dakota Board of Nursing and fully accredited by the National League for Nursing and North Central Association of Colleges and Secondary Schools.

RN Upward Mobility Program

The RN Upward Mobility Program is an integral part of the College of Nursing's undergraduate program. The curriculum for the upward mobility option deepens and extends the knowledge and capabilities of the already licensed registered nurse, preparing her/him to give more comprehensive nursing care, provide greater assistance in the prevention of disease and promotion of health practices and to develop further knowledge and skills for leadership roles in nursing.

Master of Science Degree in Nursing

A graduate program in adult nursing 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 teaching of nursing, in patient care management, and in advanced clinical practice. A gerontological emphasis is also offered.

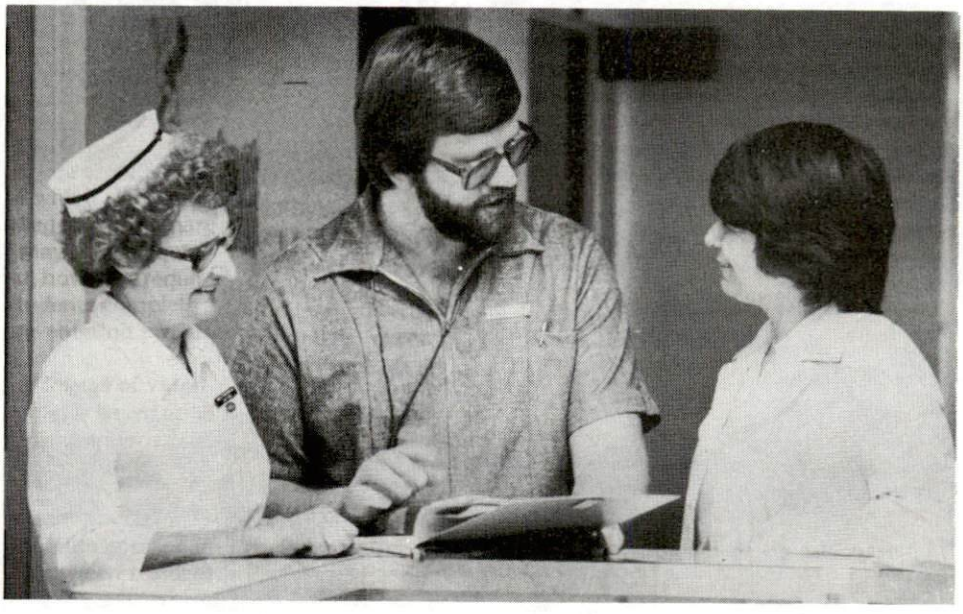
Health Science Minor

The Health Science minor provides experience in health knowledge, healthful environment and health services to undergraduate students from various disciplines.

Professional Organizations

Membership is encouraged in the local, state and national nursing student organizations. 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 at SDSU 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

Bernard E. Hietbrink, Dean
Box 2201
Brookings, SD 57007-0197

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 prepare 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 pharmaceutics, pharmaceutical chemistry, pharmacognosy or pharmacology. Students considering a specific 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 of Pharmacy is accredited by the American Council on Pharmaceutical Education.

Professional Organizations

Membership in the Academy of Students of Pharmacy is open to all students in the college. The 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 while you are on probation, your semester grade point average in pharmacy courses drops below 2.0 you 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 your preparation for entry into the profession, you 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 of Bachelor of Science in Pharmacy

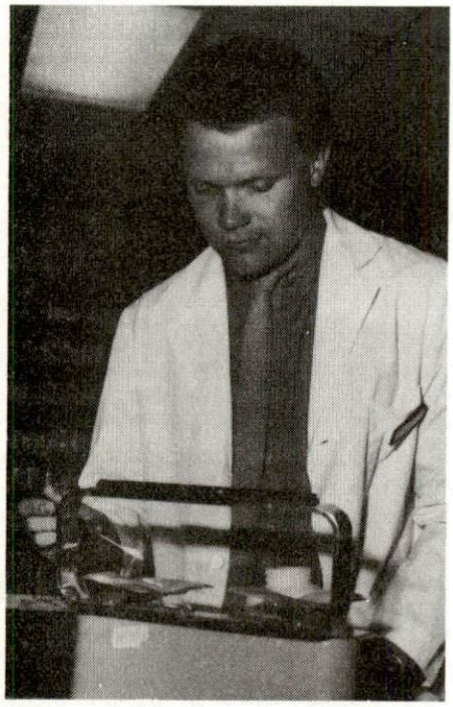
The College offers a five-year curriculum leading to the degree Bachelor of Science in Pharmacy. The curriculum is divided into a one-year pre-pharmacy segment and a four-year professional program.

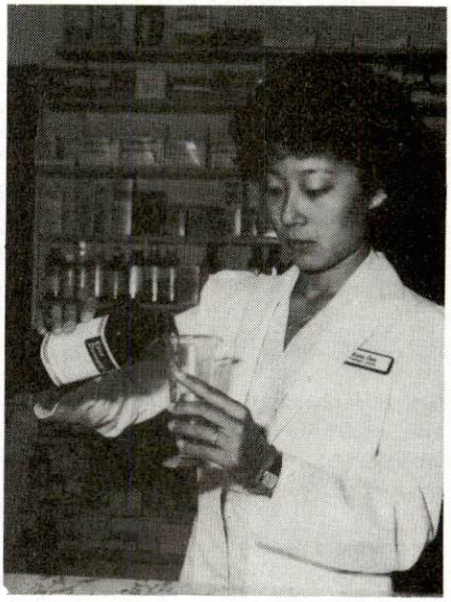
The 1-4 curriculum was developed in order to provide time for clinical experiences in the fifth year and to ensure that you are adequately prepared for these experiences.

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 accredited 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 gradepoint 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.



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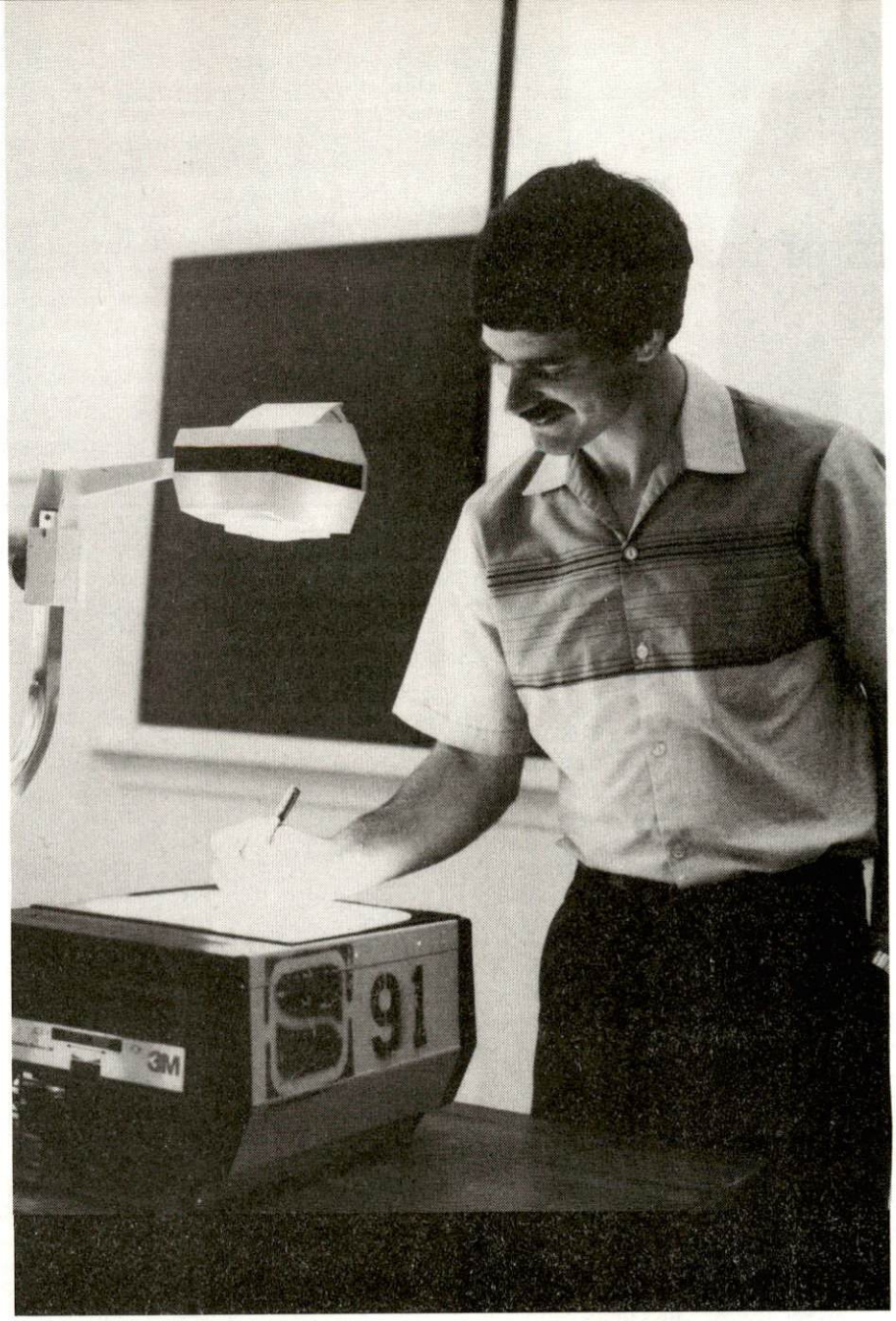

DEPARTMENTS OF INSTRUCTION

Departments of Instruction

Colleges, Departments and Program Abbreviations

Actg, Accounting
ARCH, Architecture
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
Chem, Chemistry
CHRD, Counseling and Human Resource Development
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
ElEd, Elementary Education
EM, Engineering Mechanics
Engl, English
Ent, Entomology
EPsyc, Educational Psychology
ES,Engineering Shops
ET, Electronics Engineering Technology
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. Pittman, Professor of Aerospace Studies, Head; Assistant Professors Captain Chariton, Captain Luthi, Captain Stone

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 his/her job specialty,
2. Receive a delay from active duty for pursuing an advanced degree at his/her 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.

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.

Aerospace Studies Minor

A minor in Aerospace Studies requires 16 semester hours, including all four AFROTC courses and Field Training.

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 AFROTC 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, grade point average, and 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 a 4-year AFROTC Scholarship Application Request form, to be completed following the junior year or early in the fall of the senior year. They can also contact any Air Force Recruiter for more information.

• Air Force ROTC courses are tuition free.

• Military uniforms, textbooks and equipment are furnished for all AFROTC classes.

• 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, 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 transportation. 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 leadership 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.

LIGHT AIRCRAFT TRAINING ROTC (LATR). A three-week screening program for AFROTC cadets qualified and selected to become Air Force pilots. The program is conducted during the summer at sites in Texas and Florida. LATR consists of both ground school and

approximately 14 hours of flight instruction. It is required for all pilot candidate cadets who do not have a private pilot's license and must be successfully completed in order to enter Air Force pilot training.

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, Professors Emeritus DeLong, Moe, Pahl, Wiersma; Associate Professors Durland, Froehlich, Ullery, Werner; Assistant Professors Alcock, Anderson, Bender, Julson, Kelley, Schipull, Stange; Instructor 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.

Experiential Education Programs are available in the department. Arrangements may be made for credit under Course Numbers 494, 495, 496 and Cooperative Education, Internship and Field Experience.

For mechanized agriculture courses and curriculum, as offered by the Agricultural Engineering Department, see Mechanized Agriculture for full description. For Master of Science and Ph.D. 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)

129 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 El. Org. Chem, Chem 120		
Fr Comp Engl 101 or SpCm 101	3	3
Engineering Design Graphics I-II, EG 121-122	1	1
Fitness & Lifetime Activities, PE 100	1	1
Introduction to Engineering I-II, GE 110-111	1	1
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 213	3	
Microcomputer Appl, in AE, AE 372		2
Dynamics, EM 222		3
Differential Equations, Math 321		3
Intro to Literature, Engl 218		3
Engineering Design Graphics, EG 123	1	
†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, EE 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 490	1	
Ag Engineering Concepts & Design, AE 464		4
Business Finance, BAdm 310 or Business Mgmt, BAdm 360	3	
Biological or Natural Resource Science Elective	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 humanistics/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.

Biological or Natural Resource Science Electives:	**Credits**
Animal Nutrition, AS 223	3
General Microbiology, Micr 231	4
Crop Production, PS 103	3
Crop and Livestock Insects, PS 293	3
Physical Environment of Soils & Plants, PS 352	3
World Crop & Soil Resources, PS 433	3
Anatomy, Zool 221	3

Technical Electives:

Electives in all options. Physical Climatology & Meteorology, AE 353; Special Topics, AE 493; Special Problems in AE, AE 492; 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; PL/1 Programming, CSc 316; Special Topics in Computer Science, CSc 493; Microcomputer Applications, CSc 425; Computer Architecture & Organization, CSc 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
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, EE 320	4
Electromagnetic Field Theory I, EE 385	3
Energy Conversion, EE 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.

490 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) F88 S90
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) F88 S90
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) S88 F89
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) S89 F90
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) S89 F90
Physical properties of agricultural crops and engineering principles as they apply to cutting, shearing, collecting, packaging, transporting, drying, handling and storing agricultural products.

700-701 Seminar 0-1
732 Advanced Hydrology in Agriculture 2(2,0) S89 F90
733 Ground Water Engineering in Ag 3(3,0) F90 S92
752 Theoretical Micro-Climatology 2(2,0) F88 S90
763 Instrumentation 3(2,3) S89,90
770 Special Problems in Ag Engineering (1-2 on demand)
771 Graduate Seminar 1(1,0) F88, F89
772 Similitude 2(1,2) F89, S91
773 Programming Agricultural Systems 3(2,2)
790 Thesis
791 Thesis Sustaining 1 FSSu
792 Research Report/Design Paper 2 FSSu (On demand)
795 Special Topics on Demand

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	
	16	16

Sophomore Year	Credit F	Credit S
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 Pl 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	
	17	16

Junior Year	Credit F	Credit S
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 Units, 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)
	16	16

Senior Year	Credit F	Credit S
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	2	
General Electives (See suggested list)	5	7
	16	16

*See listing of courses for humanities and social sciences electives.

Electives for Agricultural Extension 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 and Marketing, AS 285	4
Diseases of Field Crops, 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 323	4
Vegetable Growing, HO 316	3
Landscape Design I, LA 321	3

Natural Resources:	Credits
Introduction to Wildlife & Fisheries Management, WL 220	2
Principles of Ecology, Bio 211	3
World Crop & Soil Resources, PS 433	3
Community Development:	**Credits**
Sociology of Rural America, Soc 240	3
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
Leadership & Group Organization, Soc 533	3
Youth Development:	**Credits**
Social Problems, Soc 150	2
Recreation Leadership, Recr 360	2
Management in Family & Personal Living, HE 241	3
Communication and Leadership Skills:	**Credits**
**Public Speaking, SpCm 315	3
Discussion, SpCm 334	2
**Broadcast Programming, MCom 335	3
Public Administration, PolS 320	3
Other: (Applicable to all Extension programs)	**Credits**
**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 Wahlstrom, Acting Head; Professors Costello, Gartner, Gee, J. Johnson, Libal, Plumart, Romans, Slyter; Professors Emeriti Carlson, Dinkel, Embry, Kamstra, Kohler, Kortan, Lewis, Luther, McCarty, Minyard, Musson; Associate Professors Miller, Thompson; Associate Professors Emeriti Bonzer, Bush, McCone; Assistant Professors Hamilton, Insley, P. Johnson, Marshall, McFarland, Pritchard, Pruitt, Schlundt, Wagner; Adjunct Professors Bjugstad, Haas, Swanson.

The department offers instruction leading to the Bachelor of Science degree with majors in Animal Science or Range Science.

The curriculum in the department is designed to prepare students for careers in livestock production, related agriculture business enterprises, farming and ranching, public service or for graduate study which may lead to a career in teaching, research or extension.

The application of other disciplines to the breeding, feeding management and marketing of livestock and livestock products are stressed. Emphasis is placed on developing an understanding of the basic principles of genetics, nutrition, physiology and meats as they affect production and management.

Master of Science and Doctor of Philosophy Degrees may be earned in Animal Science with specialization in animal breeding, nutrition, reproduction, physiology or meats.

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

			Credits
Freshman Year	**F**		**S**
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		6
Sophomore Year	**F**		**S**
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		
Elective and option courses	7		10
Junior Year	**F**		**S**
Junior Comp, Engl 300			3
Prin of Animal Breeding, AS 332	4		
*Humanities electives	3		3
Engl 303 or MCom 313	3	or	2
Feed Technology, AS 333	4	or	4
Option and elective courses	2-9		4-10
Senior Year	**F**		**S**
Livestock Reproduction, AS 433	3		
Animal Science Seminar, AS 483	1		
AS Production Courses (See options)			
Option & elective courses	12		16

*See approved list.

Production Option,			Credits
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
Biochemistry, Chem 361			4
Livestock Evaluation and Marketing, AS 285			4
Anatomy & Physiology of Livestock, Vet 323†			4
Gen Microbiology, Micr 231			4
AS Production Courses. Elect two from: AS 365, 366, 474, 477, or 478 — one must be 474, 477 or 478			6
Group I electives			9
General electives			21-24

*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.

Science Option			Credits
Gen. Chem., Chem 112, 114			8
Organic Chem., Chem 120			4
Biochemistry, Chem 361			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
Anatomy, Zool 221 and 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	11-16

*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
Communications elective in addition to core requirement**	2 or 3
Business Management BAdm 360	3
AS Production Courses. Elect two from: AS 365, 366, 474, 477, or 478, one of which must be 474, 477, or 478	6
Business electives	12
Group I electives	6
General electives	8-12

*AS 592 Special Topics is available for students interested in additional specialized instruction in the poultry industry.
**To be chosen from Engl 303, 307; MCom 210, 313, 315, 330, 331, 335; SpCm 201, 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 the 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 horses, gaits, grooming, equipment, diets; basic instruction with suitable equipment.

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) F
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 (odd years)
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 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 antecendents 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.

490 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 SSU
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

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
712 Ruminant Nutrition 3(3,0) S
723 Population Genetics 3(3,0) S Odd years
731 Experimental Procedure 2(2,0) S Even years
732 Advanced Physiology of Reproduction 3(2,2) S Even years
733 Nutritional Interrelationships 3(3,0) S Odd Years
734 Protein and Energy Nutrition 3(3,0) F Even Years
736 Monogastric Nutrition 3(3,0) F
753 Meat Science 3(2,2) S Even years
781 Graduate Seminar 1(1,0) FS

782 Nutrition Seminar 1(1,0) FS
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 diverse curriculum which prepares students for careers in the management of rangelands, the nation's largest natural resource. Both the practical and theoretical aspects of rangeland management are stressed, with emphasis placed on livestock grazing, forage production, ecology, soil conservation, wildlife habitat, watershed values and outdoor recreation. All Range Science students complete a basic core of courses. Each student also selects one of three options which allows him/her to specialize in a major area of the field: a) Business, b) Science, or c) Technical. The Business option prepares students for careers in ranching, rural real estate or banking. Students wishing to pursue graduate studies and/or employment in rangeland research or university teaching should select the Science option. Students who choose the Technical option will qualify for employment in a number of state, federal and international agencies; they also meet all the qualifications for Range Conservationist positions with federal agencies such as the Soil Conservation Service, Bureau of Land Management, Forest Service and Bureau of Indian Affairs. Students are strongly encouraged to seek opportunities to gain practical experience in their chosen field prior to graduation.

Curriculum in Agriculture, Range Science Major
Leading to the Bachelor of Science degree.

Freshman Year	Credits
Practical Range Management, Rang 200	3
Fr. Comp Engl 101	3
Fundamentals of Speech, SpCm 101	3
Fitness & Lifetime Activities, PE 100	2
Intro Biology, Bio 151	3
Intro Biology, Bio 153 or Plant Structure and Function, Bot 200	3
Algebra, Math 111 or Algebra and Trig, Math 113	3 or 5
Intro Animal Science, AS 101	3
Intro Sociology, Soc 100	3
General Chemistry, Chem 110	4
Electives and Option courses	0-2

Sophomore Year	Credits
Principles of Range Science, Rang 300	3
Range Plant Identification, Rang 201	1
Soils, PS 113	3
Social Science Elective[1]	3
Organic Chemistry, Chem 120	4
Intro Physics, Phys 101, or Elementary Physics, Phys 111	4
Animal Nutrition, AS 223	3
Electives and Option courses	11

Junior Year/Senior Year	Credits
Range Ecosystems, Rang 321	3
Junior Composition, Engl 300	3
Plant Taxonomy, Bot 301, or Agrostology, Bot 305	3 or 4
Statistical Methods, Stat 341	3
Communication Elective[2]	2
Humanities Electives[2]	6
Range Improvement, Rang 411	2
Beef Production, AS 474, or Sheep and Wool Production, AS 477	3
Electives and Option Courses	38-39

[1]See approved list. Students taking the Technical Option are required to take Rural Sociology, Soc 240 to fulfill this requirement.
[2]See approved list.

Business Option (Ranch/Business)	Credits
Macro Economic Principles, Econ 201	3
Micro Economic Principles, Econ 202	3
Principles of Accounting, Actg 210	3
Business Management, BAdm 360	3
Agricultural Marketing, AgEc 354, or Marketing, Econ 353	3
Other Business Electives[1]	6
Range Measurements, Rang 323	2
Range Management Planning for Ranchers, Rang 471	2
Plant Ecology, Bot 415 or Plant Pathology, Bot 427	4
Farm and Ranch Management, AgEc 271	4
Feed Technology, AS 333	4
Beef Production, AS 474, or Sheep and Wool Production, AS 477, or Horse Production, AS 365[2]	3
General Electives	9-12

[1]See approved list.
[2]Two of these courses must be taken to fulfill both the Range Science Core and the Business Option requirements.

Science Option (Range Science/Research)	Credits
Macro or Micro Economic Principles, Econ 201 or 202	3
Range Measurements, Rang 323	2
Range Management Planning for Ranchers, Rang 471, or Range Management Planning on Public Lands, Rang 470	2
Range Surveys, Rang 324	2
Field Studies in Range Science, Rang 421	2
Calculus for Non Math majors, Math 222	5
Elementary Biochemistry, Chem 361	4
Additional Math, Chemistry or Physics	2
Soil Geography and Land Use Interpretation, PS 310, or Soil Fertility and Fertilizers, PS 323	4 or 3
Plant Ecology, Bot 415	4
Plant Physiology, Bot 427	4
Genetics, Bio 371, or Evolution, Bio 373	3
Group I Elective	3
General Electives	9-13

Technical Option (Range Resource Conservation)	Credits
Macro or Micro Economic Principles, Econ 201 or 202	3
Range Measurements, Rang 323	2
Range Surveys, Rang 324	2
Range Management Planning for Ranchers, Rang 471	2
Range Management Planning Public Lands, Rang 470	2
Plant Ecology, Bot 415, or Plant Physiology, Bot 427	4
Field Studies in Range Science, Rang 421	2
Soil Geography and Land Use Interpretation, PS 310, or Soil Fertility and Fertilizers, PS 323	3 or 4
Intro Wildlife and Fisheries Management, WL 220	2
Outdoor Recreation Resource Management, PR 202	3
Conservation and Management Soils, PS 372	2
Technical Communication, Engl 303[1]	3
Engineering Design Graphics, EG 121, and Elementary Surveying, CE 106, or Soil and Water Mechanics, MA 333, or Cartography, Geog 383	5 o 3
Farm and Range Management, AgEc 271	4
General Electives	9-15

[1]Taken in addition to the communications elective required in the Range Science core course listing.

Range Science Minor

Eighteen credits with twelve hours of Range Science courses, including Rang 300, and other courses as approved by the department.

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 alloted 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.

300 Principles of Range Science 3(3,0) F Even years

Basic principles of Range Science including structure, function and management of range ecosystems. Also studied are energy flow, the water cycle, nutrient cycles, range plant physiology, grazing management and grazing systems. Desirable antecedents: 200, PS 113**.

321 Range Ecosystems 3(3,0) S Even years

Description of the range ecosystems of North America with discussion of the major uses of each, including major range plants and animals of each region, forage values and management response of important range plant species. Other topics include ecosystem structure and function and classification of ecosystems. Desireable antecedents: 300, Bot 301, 305.

323 Range Measurements 2(2,0) S Odd years

Principles of sampling and measurements of important characteristics of range ecosystems. Special attention given to measurement of attributes of vegetation, soil and grazing animals for the management of public and private rangeland for multiple uses. P, Stat 341. Desirable antecedents: 300.

324 Range Surveys 2(0,6) Su* Odd years

Range measurement field course with emphases on vegetation sampling, measurement of livestock parameters, and determinations of range condition and trend, utilization patterns and potential stocking rates. Ecological characteristics and field recognition of important range plants stressed. Desirable antecedents: 323, PS 310.

410 Grazing Management 2(2,0) on demand

History and evolution of the science and art of grazing management. Discussion of the potential benefits and risks associated with implementing sophisticated grazing systems.

411 Range Improvement 2(2,0) F Odd years

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(0,6) Su* Even years

Extended field trip to study major range ecosystems of the plains, mountains and intermountain basins. Major uses 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) S Odd years

Range management planning in the context of state and federal lands. Selection of ecologically sound alternative management strategies for multiple uses considering economic, legal, ethical, sociological, political, institutional and historic influences.

471 Range Management Planning for Ranchers 2(1,2) S Even years

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 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.

*Two-week, intensive study course scheduled independent of regular summer session.

**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) S Odd years

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, Head Professors Chen, Granholm, J. Haertel, Myers, Peterson, Whalen; Professors Emeriti Hartwig, Holden, Hugghins, Morgan, Taylor; Associate Professors L. Haertel, Hutcheson, Larson, Morrill, Olson; Assistant Professors Hildreth, Kayongo-Male.

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 preprofessional 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

Freshman Year	**F**	**S**
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
Sophomore Year	**F**	**S**
Macroeconomic Principles, Econ 201		3
Organic Chem, Chem 120 & Chem elective (Recommend Chem 361); or Organic Chem, Chem 326, 328	4	4
Gen Microbiology, Micr 231	4	
Prin of Ecology, Bio 211	3	
Plant Kingdom, Bot 201		3
Animal Kingdom, Zool 203 (or Zool 357 & 365)	3	
Sophomore Seminar, Bio 290	1	
Intro to Sociology, Soc 100		3
Social Science elective (approved list)		3
*Elective	1	
Junior Year	**F**	**S**
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	
Evolution, Bio 373		3
Senior Year	**F**	**S**
Communications Elective (recommend Writing in the Sciences, Engl 307)	2	
Seminar, Bio 490	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.

Curriculum in Arts and Science, Biology Major
Leading to the Bachelor of Science Degree

Freshman Year	**F**	**S**
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	
Sophomore Year	**F**	**S**
†Humanities elective (approved list: two areas)	4	
Organic Chem, Chem 120 & Chem elective (Recommend Chem 361); or Organic Chem 326, 328	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	

Sophomore Seminar, Bio 290	1	
Social Science elective (approved list: two areas)		3
Electives	1	2
Junior Year	**F**	**S**
Junior Composition, Engl 300	3	
Elementary Physics, 111-113	4	4
Genetics, Bio 371	3	
Cell Biology, Bio 343		3
Evolution, Bio 373		3
Electives in Biological Sciences	3	
Social Science electives (approved list: two areas)	3	
Humanities elective (approved list: two areas)		5
*Electives		1
Senior Year	**F**	**S**
Seminar, Bio 490	1	
Electives in Biological Sciences	3-4	
Physiology elective, Bot 427 or Zool 325		4
Social Science elective (approved list: two areas)	3	
*Electives (recommend Biological Science courses; Biochemistry, Chem 361; Statistical Methods, Stat 341 in Fall; Histological Techniques, Bio 445 in Spring)	8-9	12

*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).
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 Arts and Science, Biology Major
Leading to the Bachelor of Arts Degree

Freshman Year	**F**	**S**
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	
Sophomore Year	**F**	**S**
†Social Science elective (approved list: two areas)		4
Organic Chem, Chem 120 and Chem elective (Recommend Chem 361); or Organic Chem, Chem 326, 328	4	4
General Microbiology, Micro 231	4	
Principles of Ecology, Bio 211	3	
Plant Kingdom, Bot 201		3
Sophomore Seminar, Bio 290	1	
Foreign Language	4	4
Animal Kingdom, Zool 203		3
Junior Year	**F**	**S**
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
Evolution, Bio 373		3
Foreign Language	3	3
*Electives	3	
Senior Year	**F**	**S**
Seminar, Bio. 490	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)	6	6

*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).
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

Freshman Year	**F**	**S**
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 & Plan Trig, Math 120)	5	
Intro Biology, Bio 151, 153	3	3
Electives		5
Sophomore Year	**F**	**S**
Intro to Sociology, Soc 100	3	
Macroeconomics Principles, Econ 201		3
Plant Structure and Function, Bot 200		3
Plant Kingdom, Bot 201		3
Sophomore Seminar, Bio 290	1	
Organic Chem, Chem 120	4	
Elementary Biochem, Chem 361		4
Humanities electives	3	3
Electives	5	
Junior Year	**F**	**S**
Junior Comp, Engl 300	3	
Microbiology, Micr 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
Senior Year	**F**	**S**
Plant Ecology, Bot 415	4	
Plant Anatomy, Bot 421	3	
Plant Physiology, Bot 427	4	
Histological Techniques, Bio 445		3
Seminar, Bio 490		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

Freshman Year	**F**	**S**
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	

Sophomore Year	F	S
†Social Science (Approved List: two areas)	6	3
Plant Structure & Function, Bot 200		3
Plant Kingdom, Bot 201		3
Sophomore Seminar, Bio 290	1	
Organic Chem, Chem 120	4	
Microbiology, Micr 231		4
†Humanities elective (Approved list: two areas)	6	3

Junior Year	F	S
Junior Comp, Engl 300	3	
Genetics, Bio 371	4	
Plant Taxonomy, Bot 301		4
Zoology Elective		4
Chem elective (Recommend Chem 361)	4	
Elementary Physics, Phys 111-113	4	4
Histological Techniques, Bio 445		3
*Electives		1

Senior Year	F	S
Plant Ecology, Bot 415	4	
Plant Anatomy, Bot 421	3	
Plant Physiology, Bot 427	4	
Seminar, Bio 490		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

Freshman Year	F	S
Fr Comp, Engl 101	3	
Fitness & Lifetime Activities, PE 100	1	1
Intro Biology, Bio 151, 153	3	3
Gen Chem, Chem 112-114	4	4
Algebra & Trig: Math 113 (or Algebra, Math 111 & Plane Trig, Math 120)	5	
Fund of Speech, SpCm 100		3
Intro to Sociology, Soc 100		3
Electives (from Approved List)**		2

Sophomore Year	F	S
Prin of Ecology, Bio 211	3	
Organic Chem, Chem 120 & Chem elective (Recommend Chem 361); or Organic Chem, Chem 326, 328	4	4
Soils, PS 113	3	
Elementary Physics, Phys 111-113 (or Phys 211-213)	4	4
Gen Microbiology, Micr 231		4
Macroeconomics Principles, Econ 201		3
Electives§	2	1

Junior Year	F	S
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	7
Electives§		4

Senior Year	F	S
Seminars†	1	1
Humanities Electives	3	3
Electives (from Approved List)**	7	7
Electives§	5	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

Freshman Year	F	S
Intro Biology, Bio 151, 153	3	3
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
Intro to Sociology, Soc 100	3	
Algebra & Trig, Math 113 or Math 111-120		5
*Electives	2	

Sophomore Year	F	S
Elementary Physics, Phys 111-113	4	4
Macroeconomics Principles, Econ 201	3	
Organic Chemistry, Chem 120 & Chem elective (recommend Chem 361); or Organic Chem, Chem 326, 328	4	4
Prin of Ecology, Bio 211	3	
Sophomore Seminar, Bio 290	1	
Anatomy, Zool 221		3
General Microbiology, Micr 231		4

Junior Year	F	S
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	5
Humanities electives (approved list)	3	

Senior Year	F	S
Communications elective (from list under Core Curriculum in Biol Sci)		2
Social Science (from approved list)		3
Vertebrate Histology, Zool 441	4	
Elective (Recommend Statistical Methods, Stat 341)	3	
Seminar, Bio 490		1
Humanities (from Approved List)	3	
*Electives	6	10

*Any course in the General Catalog but recommend the following: Bio 373 and 445; and other courses with Bio, Bot, 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).

Curriculum in Arts and Science, Zoology Major
Leading to the Bachelor of Science Degree

Freshman Year	F	S
Intro Biology, Bio 151, 153	3	3
Algebra and Trig, Math 113 (or Algebra, Math 111 & Plane Trig, Math 120)	5	
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
Social Science (from approved list)		3
Electives		2

Sophomore Year	F	S
Elementary Physics, Phys 111-113	4	4
Organic Chem, Chem 120 & Chem elective (Recommend Chem 361); or Organic Chem, Chem 326, 328	4	4
General Microbiology, Micr 231		4
†Humanities (from Approved List)	3	
Prin of Ecology, Bio 211	3	
Anatomy, Zool 221		3
Sophomore Seminar, Bio 290	1	
*Electives	1	1

Junior Year	F	S
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)	3	1

Senior Year	F	S
Vertebrate Histology, Zool 441	4	
Elective (recommend Statistical Methods, Stat 341)	3	
Social Science (from Approved List)	3	
† Humanities (from Approved List)		3
Seminar, Bio 490	1	
**Electives (see Approved List)	5	13

*General Electives may come from any department listing in the catalog. A suggested elective is CSc 271.

**Any course in the General Catalog but recommend the following: Bio 373 and 445; and other courses with Bio, Bot, or Zool prefix; WL 363, 367; Micr 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.

290 Sophomore Seminar 1(1,0) F

Student will explore the various career opportunities in the biological sciences and procedures for employment.

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 Introduction 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

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) F (odd 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 (even years)

Procedures in genetic studies as they relate to molecular and classical genetic applications. P, Bio 371 (cross-listed with Plant Science).

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

773 Cytogenetics 3(2,3) F (odd years)
(Cross-listed PS 773)

790 Thesis in Biology (1-7) FSSu

792 Graduate Seminar 1(1,0) FSSu

793 Biological Research Problems 1-2 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.

453 Mycology 3(2,3) F
(See description in Plant Science)

Graduate Courses

597-697 Special Topics (1-5) FS
Advanced Plant Anatomy, Morphology of Non-Vascular Plants, Morphology of Vascular Plants, Plant Taxonomy.

705 Aquatic Plants 3(1,4) F (even years)

715 Advanced Plant Ecology 4(2,3) S

727 Advanced Plant Physiology 4(2,4) S (even years)

781 Plant Tissue Culture 3(2,3) F (even years)

785 Growth and Development 4(2,4) S (odd years)

Zoology (Zool) Undergraduate Courses

123 Human Biology 3(3,0) F
Presents key biological principles that are characteristic of living things in general and human beings in particular, focusing on the application of these principles to the concerns of contemporary life. Not intended for life science majors.

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) S
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.

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, phylogenic 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 (odd years)
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).

425 Human Diseases 3(3,0) S
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.

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) F
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 (1-5) 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

721 Mammalian Anatomy 4(2,6) S (odd years)

723 Systemic Physiology 4(3,3) F (even years)
(Cross-listed as Vet 723)

725 Systemic Physiology 4(3,3) S (odd years)
(Cross-listed as Vet 725)

727 Endocrinology 4(3,3) F (odd years)
(Cross-listed as Vet 727)

797 Special Topics in Zoology (1-5) FS

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, 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

Agricultural Economics (AgEc)

271 Farm & Ranch Management 4(3,2) FS
354 Agricultural Marketing and Prices 3(3,0) FS
373/PS 373 Rural Real Estate Appraisal 3(2,2) F
454 Economics of Grain and Livestock Marketing 3(3,0) F
478 Agricultural Finance 3(3,0) S

Business Administration (BAdm)

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) F
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 (SpCm)

201 Interpersonal Communication 3(3,0) S
315 Public Speaking 3(3,0) FS

Textiles, Clothing and Interior Design (TCID)

275 Fashion Economics 3(3,0) F
373 Retailing 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 Pravecek.

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 361, 461, and 562 in their curriculum as well as advisor recommended courses in related departments.

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
Gen Chem, Chem 112-114	4	4
Mathematical Analysis, Math 123 or Calculus for non-Math Major, Math 222	5	
Biological Science	3	3
Fitness & Lifetime Activities, PE 100	1	1
Electives*		5
Sophomore Year	**F**	**S**
Fund of Organic Chemistry, Chem 326-328	4	4
Elem Physics I-II, Phys 111-113	4	4
Chemical Calculations, Chem 270		2
Electives*	7	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 330, Chem 344, Chem 345, Chem 352, Chem 361, 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
Gen Chem, Chem 112-114	4	4
Mathematical Analysis, Math 123 or Calculus for non-Math Major, Math 222	5	
Biological Science	3	3
Fitness & Lifetime Activities, PE 100	1	1
Electives*		5
Sophomore Year	**F**	**S**
Fund of Organic Chemistry, Chem 326-328	4	4
Elem Physics I-II, Phys 111-113	4	4
Chemical Calculations, Chem 270		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
Senior Year	**F**	**S**
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 below.
**At least 6 hours of chemistry selected from the following courses must be taken. Chem 330, Chem 344, Chem 345, Chem 352, Chem 361, 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 330, 361, 382, Stat 341; CSc 271
Biological Sciences
Chem 330, 361, 461; Biological Science upper division, 9 credits; Bio 151
Education
Chem 352, 361, 380; Educ Requirements
Environmental
Chem 330, 361, 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 330, 352, 361; Stat 341; CSc 271

Curriculum in Arts and Science, Professional Chemistry 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
Mathematical Analysis I, Math 123	5	
Mathematical Analysis II, Math 224		4
First Year German, Germ 101-102	4	4
Fitness and Lifetime Activities, PE 100	1	1
Electives		2
Sophomore Year	**F**	**S**
Quantitative Analysis, Chem 232	4	
Mathematical Elective	3	
Gen Physics I-II, Phys 211-213	4	4
Fundamentals of Organic Chemistry, Chem 326-328	4	4
Chemical Calculations, Chem 270		2
Electives*	1	5
Junior Year	**F**	**S**
Junior Comp, Engl 300	3	
Inorganic Chemistry, Chem 352	4	
Physical Chem, Chem 342-344	5	5
Electives*	4	11
Senior Year	**F**	**S**
Instrumental Analysis Chem 434		4
Advanced Chem elective	3	3
Advanced Physics elective	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	**F**	**S**
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	**F**	**S**
Mathematics or Statistics Elective	3-5	
Elementary Organic Chem, Chem 120	4	
Quantitative Analysis, Chem 232		4
Anatomy, Zool 221	3	
General Microbiology, Micr 231		4
Prin of Econ I, Econ 201	3	
Meat Selection and Utilization, AS 249		2
Dairy Foods, DS 231	3	
Electives		6
Junior Year	**F**	**S**
Junior Comp, Engl 300	3	
Biochemistry, Chem 361	4	
Elem or Gen Physics, Phys 111-113 or 211-213	4	4
Human Nutrition, NFS 321	3	
Applied Chem Instrumentation, Chem 330		3
Experimental Food, NFS 341		3
Experimental Testing and Dev. in Food Science, NFS 342		3
Electives		3
Senior Year	**F**	**S**
Elementary Phy Chem, Chem 340-341		4
Mammalian Physiology, Zool 325	4	
Food Microbiology, Micr 311	3	
Electives	10	12

*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; Charles E. Breck, M.D., St. John's Medical Center, Longview, WA; Harold 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 Pennepacker, M.D., St. Luke's Medical Center, Sioux City, IA; Wesley Putnam, M.D., Sioux Valley Hospital, Sioux Falls, SD; Program Directors/Education 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; Mary Puhl Smith, MT(ASCP), Marian Health Center, Sioux City, IA; Vlasta M. Avalon, MT(ASCP), St. John's Medical Center, Longview, WA.

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 112 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
Sophomore Year	**F**	**S**
Elem Organic Chem, Chem 120	4	
Biochemistry, Chem 361		4
Elem Physics, I-II, Phys 111-113	4	4
Gen Microbiology, Micro 231		4
**Electives	8	5
Junior Year	**F**	**S**
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		3
Parasitology, Zool 467	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; Computer Science 311.

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, quality control, instrumentation, computer applications and experience in body fluids and urine in regard to chemical and cellular composition. Anatomy and physiology, theory of renal function in health and disease.

Clinical Hematology/Coagulation
Lecture, supervised laboratory instruction, quality control, instrumentation, computer applications 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.

Clinical Microbiology
Lecture, supervised laboratory instruction, quality control, instrumentation, computer applications and experience in the isolation and identification of pathogenic organisms and their susceptibility to anti-microbial agents. Includes Bacteriology, Mycology, Parasitology, and Virology.

Clinical Serology/Immunology
Lecture on antigen/antibody structure-function-interactions, supervision laboratory instruction, quality control, instrumentation, computer applications, and experience in applying the principles of immunology to serologic diagnosis.

Clinical Chemistry/Radiobioassay/Body Fluids
Lecture, supervised laboratory instruction, quality control, computer applications, instrumentation, and experience in medically oriented biochemistry as applied to normal and abnormal physiology and analysis of body constituents. Includes analyses of special body fluids such as amniotic, synovial, cerebrospinal, gastic and pleural fluids. Includes special procedures utilized for toxicology, endocrinology and radiobioassay.

Clinical Immunohematology
Lecture, supervised laboratory instruction, quality control, instrumentation, computer applications 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.

Management and Supervision
Lectures and/or seminars on theory and techniques of laboratory oriented management practices utilized in planning, organizing, directing, controlling and supervising a clinical laboratory facility.

Educational Methodologies
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, scientific writing, case study presentations and/or projects in specialty area(s) of medical technology.

Specialized Units (Special Topics)

Orientation to Medical Technology
Introduction to basic techniques, principles of 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 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. Includes statistical techniques method evaluation, and pipette calibration.

Chemistry (Chem)

Undergraduate Courses

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 361 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).

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 3-4(3,0 or 3,3) 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.

361 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 361 not allowed.

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 1989
Theory and practice in instrumental analysis. P, 232, 328, 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, 361.

494/495/496 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.

495 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 or 328, 344 or concurrent registration.

532-632 Advanced Analytical Chemistry 3(3,0) F
Theoretical treatment of principles involved in noninstrumental analytical chemistry including sampling and statistics. P, 344.

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.

554-654 Advanced Inorganic Chemistry 3(3,0) S
Inorganic systems including theoretical, representative group and transition metal topics. P, 344 or 352.

562-662 Principles of Biochemistry 3-5(3,0 or 3,6) F
Chemistry of biological processes occuring in plants and animals. P, 361.

572-672 Seminar 1(1,0) FS
Required of all graduate chemistry majors.

591-691 Special Problems* (0,*) FS

701 Concepts in Chemistry 1-10
Atomic Structure and Bonding
Periodic Relationships
Formulas and Reactions
Stoichiometry and Chemical Math
Acids, Bases, and Salts
Solutions and Equilibria
Descriptive Chemistry

702 Environmental Chemistry 2

703 Computers in Chemistry 2

704 Industrial Processes 2

705 Instrumentation in Chemistry 2

706 Biological Chemistry 2

707 Inorganic Chemistry 2

708 Organic Chemistry 2

709 Alternative Energies 2

710 Lecture Demonstrations 2

711 Instructional Laboratories 2

712 Consumer Chemistry 2

720 Special Topics in Organic Chem 1-6

724 Structural Determination of Organic Compounds 3(2,3) F (1989)
Structural determination primarily by spectroscopy. P, 434

728 Physical Organic Chemistry 3(3,0) F (1988)
Physical organic, reaction mechanisms, m.o. calculations, orbital symmetry, and e.s.r. spectroscopy. P, 344.

730 Special Topics in Analytical Chem 1-6

734 Analytical Spectroscopy 3(3,0) S (1990)
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

736 Chromatography and Separations 3(3,0) S (1989) Theory and practice of solvent extraction and paper, thin layer, gas and liquid chromatographic techniques. P, 232.
740 Special Topics in Physical Chem 1-6
744 Chemical Thermodynamics 3(3,0) F (1988)
Discussion of the laws and theories of classical and statistical thermodynamics as related to macroscopic chemical systems. P, 344.
746 Atomic and Molecular Structure 3(3,0) F (1989)
Quantum mechanics and theoretical treatment of chemical structure and binding. P, 224 or 328, 344, or concurrent registration in 344.
750 Special Topics in Inorganic Chem 1-6
752 Descriptive Inorganic Chemistry 3(2,3) F (1989)
Periodic relationships of the elements. Preparation and purification of typical inorganic compounds. P, 120 (4 credits), 352.
760 Special Topics in Biochemistry 1-6
764 Biochemistry I 3(3,0) S (1989)
766 Biochemistry II 3(3,0) S (1990)
773 Seminar 1(1,0) FS
781 Bioinorganic Chemistry 3(3,0) F (1988)
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.
782 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.
790 M.S. Thesis in Chemistry 1-7 credits

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

Assistant Professor Henry, Acting Head; Professors Kranzler (Emeritus), Richardson; Assistant Professors Branum, Gilkerson, Russell, Sorenson; Instructors Ceglian, Helling, Schieck.

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 for Certification in Elementary Education

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 the curriculum. Majors in Child Development and Family Relations may elect to train for occupations in these general fields: Early Childhood Education, Elementary Education, and Child and Family Services. Eligible students may enter the 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.

Admission to the Cooperative Elementary Education programs at BHSC and DSC requires a graduation ratio of 2.5. An overall graduation ratio of 2.5 and a 2.6 graduation ratio in major courses is required for graduation in the Cooperative Elementary Education programs.

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 in CDFR

The core curriculum in Child Development and Family Relations consists of: CDFR 141, 211, 271, 312, 313, 342, 361, 362, 363, 364, 414, 472, 473, and 1-3 other credits in CDFR from 250, 401, 443, 465, 492; Psyc 101; Soc 100; SpCm 334; EPsyc 303; the Home Economics core courses, and the university core courses. In addition, students take specific requirements for their option and/or concentration.

Child Development and Family Relations — Early Childhood Education Option

This option is for the students interested in early childhood education teaching and/or administration in settings such as nursery schools, day care programs, Head Start and related programs.

Freshman Year	Credits
Family Development, CDFR 101	2
Field Experience, HE 101	1
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
Other Requirements or Electives	2
	32

Sophomore Year	Credits
Human Development and Personality I: Childhood, CDFR 211	3
Experience in Human Relations, CDFR 271	3
Exceptional Child, EPsyc 303	3
Discussion, SpCm 334	2
Dynamics of Family Development, CDFR 342	3

Adv. First Aid, Hlth 360	2
Hum Dev: Cultural/Economic, CDFR 363	3
Other Requirements and Electives	13-15
	32-34

Junior Year	Credits
Junior Comp, Engl 300	3
Materials and Techniques in Creative Expression, CDFR 361	4
Planning and Methodology for Parent Education, CDFR 364	4
Human Dev. and Personality II: Adol., CDFR 312	2
Human Dev. and Personality III: Mid and Later Years, CDFR 313	2
Home Economics Electives from HE 241, HE 442, NFS 221, NFS 321, NFS 391, TC 413, ID 221	3-6
Other Requirements and Electives	8-15
	32-36

Senior Year	Credits
Practicum, CDFR 497	4-12
Intro. to Dev. Assessment, CDFR 465	2
Current Research and Theory, CDFR 414	3
Student Teaching in Preschool Programs I & II, CDFR 472/473	8
Other CDFR courses from 250, 401, 443, 492	1-3
Other Requirements and Electives (Suggested electives: BAdm 360; Actg 210; SeEd 405; Danc 131; EdFn 385; Chem 100; Phy 101; Zool 123; He 442	3-25
	32-34

Practicum, CDFR 497 is not required for the Cooperative Programs with DSC and BHSC.

Child Development and Family Relations: Cooperative Programs Leading to Certification in Elementary Education

This option, or area of specialization requires the coursework listed above for the Early Childhood Education Option and additional coursework. Elementary Education Certification may be obtained by taking additional required courses at SDSU and at a cooperating institution (either Dakota State College or Black Hills State College). Professional education and required courses with grades below "C" will not meet the requirements for the Cooperative Programs with Dakota State College and Black Hills State College.

Students entering the cooperative program with either DSC or BHSC can take courses at SDSU that will meet certification requirements. In addition, students spend approximately 3 additional terms on campus at DSC or BHSC. Those certification requirements that can be met at SDSU are listed below.

Cooperative Program at Black Hills State College, 2 semesters and 1 summer

Courses recommended by BHSC:

US History I or II, Hist 251 or 252	3
Movement Exp. with Children, PE 359, or Elem Sch. PE, PE 360	2
Hist of Am Indian, Hist 368	3
History of American Indian, Hist 368	3
Survey of Math, Math 140	3
Pract. and Prof. Lab, SeEd 287	2
Ed. Psyc, EPsyc 302	2
Amer Govt, PolS 100	3
Chemistry, Chem 100, or 110	4
Drawing I, ArtS 112	3
Intro Biology, Bio 151 or 153	3
Physical Geog, Geo 131	4
Intro American Ed., EdFn 339	2
Computers in Teaching, EdFn 385	2

Current course requirements for the semesters to be spent at BHSC may be obtained from the CDFR Department office.

Cooperative Program at Dakota State College, 3 semesters

Courses recommended by DSC:

Hist of Am Indian, Hist 368, or Indians of No. Amer, Anth 421	3
Intro Amer Ed, EdFn 339	2
Ed Psyc, EPsyc 302	2
Amer Govt, PolS 100	3
Phys Geog, Geo 131	4
Algebra 113	3
Intro Biology, Bio 151 or 153	3
US Hist I, II, Hist 251, 252	6
Computers in Teaching, EdFn 385	2
Survey of Math, Math 140	3

Current course requirements for the semesters to be spent at DSC may be obtained from the CDFR Department office.

Child Development and Family Relations: Child and Family Services Option

For students interested in working in social 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	1
Career Exploration, HEd 101	1
Nutrition and the Family, NFS 101	2
Clothing the Family, TC 101	1
Housing and the Family ID 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 140, Survey of Math	3
Intro to Sociology, Soc 100	3
Other Requirements or Electives	2
	32

Sophomore	Credits
Human Dev. and Personality I: Childhood, CDFR 211	3
Experience in Human Relations, CDFR 271	3
Exceptional Child, EPsyc 303	3
Discussion, SpCm 334	2
Dynamics of Family Dev., CDFR 342	3
Hum. Dev: Cultural/Economic, CDFR 363	3
Other Requirements and Electives	15-18
	32-34

Junior Year	Credits
Junior Comp, Engl 300	3
Materials and Techniques of Creative Expression, CDFR 361	4
Planning and Methodology for Preschool Programs, CDFR 362	4
Parent Education, CDFR 364	3
Human Dev. and Personality II: Adol., CDFR 312	2
Human Dev. and Personality III: Mid and Later Years, CDFR 313	2
Home Economics Electives from HE 241, HE 442, NFS 221, NFS 321, NFS 391, TC 413, ID 221	3-6
Other Requirements and Electives	8-15
	32-36

Senior Year	Credits
Practicum	4-12
Current Research and Theory, CDFR 414	3
Student Teaching in Preschool Programs I, II, CDFR 472/473	8
Other CDFR courses from 250, 401, 443, 465, 492	1-3
Other Requirements and Electives	3-23
	32-36

The options, or areas of specialization, have the following, respective requirements in addition to those listed above.

Family and Youth Organization
HPER Recreation Minor 22

Social Services Concentration
Intro to Social Work, Soc 270 3
Social Legislation, Soc 370 3
Problems in Family Relations, CDFR 443 3
Family Resource Management Lab, HE 442 3

15 elective credits with adviser approval from: Soc 150, 351, 451, 471; Psyc 356, 357, 358, 362, 441, 451.

Children's Services in Hospital Concentration
Human Biology, Zool 123 3
Chem 100 or Chem 110 4
Intro to Dev. Assessment, CDFR 365 2
Advanced First Aid, Hlth 360 (or equivalent) 2
Health Science or Nursing Courses 8-10

Religious Service Concentration
Philosophy and Religion Courses 10-12
To be decided upon in conference with CDFR and Religion department advisers.
HPER-Recreation 10-22
The specific courses are to be agreed upon in conference with major adviser.

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 students of all majors. Personal consultation service available.

211 Human Development and Personality I: Childhood 3(3,0) FSSu
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(3,0) FSu
A basic course which explores the biological, behavioral, and cultural aspects of human sexuality. The course focuses on individual sexual development, inter-personal aspects of sexual behavior and social/cultural values and beliefs about sexuality and sex roles throughout the lifespan.

271 Experience in Human Relations By Reservation Only 3(1,6) FS
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) FS
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, mathematics, social studies and social-personal growth aimed at appreciation, understanding and evaluation of creative production of children in relation to their developmental stages. P, 211, 271, concurrent with CDFR 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) S
Human development as influenced by the dynamics of family interaction under varied cultural and economic influences.. Families of both rural and urban groups are included.

364 Parent Education 3(3,0) S
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 (on sufficient demand)
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 and family research and theories. Strong emphasis on learning to read research studies intelligently. Paper on current research topic is required. P, 211 and Sr. standing, or instructor's consent.

443 Problems in Family Relations and Child Development 3(3,0) S
Study of problems resulting from the predictable and unpredictable stresses families encounter. Consideration of the current findings on such topics as divorce and remarriage, family abuse, family health issues, exceptional children. Field experiences included. Open to students from all colleges.

465 Introduction to Developmental Assessment of Young Children 3(3,0) S, odd years
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 211 and CDFR 271 or equivalent.

472 Student Teaching in Preschool Programs I By Reservation Only 4(1,10) FS
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, 361, 362.

473 Student Teaching in Preschool Programs II By Reservation Only 4(1,10) FS
Should be taken concurrently with CDFR 472

492 Special Problems 1-4
Individual study for qualified students. P, instructor's consent.

497 Practicum in Child and Family Services By Reservation Only 4-12 FSSu
Field experience with agencies delivering social services to children and families. P, instructor's consent.

Graduate Courses

543/643 Current Topics 1-3(1-3,0) FSu
Study of current issues and concerns in human development, family therapy, and family studies. Focus on topics not included in other graduate courses in the department. P, consent. Can be repeated.

702 Seminar 1-3(1-3,0) (On sufficient demand)
Reports and discussions of current literature, including research methodology in human development, family studies, and family therapy.

711 Child Development Theory and Application 3(3,0) S
Emphasis upon understanding underlying theories and their applications relating to developmental and growth processes; relationship between cognitive, social/emotional, and physical development and behavior patterns; range of normality in development. Focus on normal development, but consideration of deviance will be considered.

742 Family Relations 3(3,0) FSu
Study of current theories and literature on family interaction. Impact of various forces (social, personal, intra-personal) on the dynamic aspects of family relationships. Emphasis upon normal families.

744 Human Development: Gender Issues, Roles and Relationships 3(3,0)Su (On sufficient demand)

Study of recent literature regarding the changing roles of women and the impact of changing roles on individual human development across the lifespan, family relationships, employment and other areas of life.

776 Early Childhood Education, Administration and Practicum 1-4 (On sufficient demand)

Field experience with early childhood education (teaching, supervising, and administration). P, departmental consent.

777 Child and Family Counseling 3(3,0) S

Theory and philosophy of counseling and therapy with individual children and their families using a family systems approach.

782 Special Problems in Human Development and Family Relations 2-4

Individual study for qualified students. P, consent of instructor.

Civil Engineering (CE)

Professor Rollag, Head; Professors Dornbush, Hassoun, Koepsell, Prasuhn, Selim, Sigl; (Emeritus) Larson; Associate Professors Johnson (adjunct), Shafi, Tiltrum; Assistant Professor Forest; Instructor DeBoer.

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 12 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, CE 495 Internship or CE 496 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 112	4	
Fr Comp Engl 101 and Fund of Speech, SpCm 101	3	3
Fitness and Lifetime Activities, PE 100	1	1
Introduction to Engineering I-II, GE 110-111	1	1
Engineering Design Graphics, I-II EG 121-122	2	1
Gen Chem or Elementary Organic Chem, Chem 114 or 120		3
Elementary Surveying, CE 106		3
	16	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	
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 213	3	
	16	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 Tech. Comm., Engl 303	3	
Prin of Economics I, Econ 201	3	
Transportation Engineering, CE363	3	
Seminar, CE 490	0	
Structural Theory, CE 353		3
Engineering Geology, CE 336		3
Thermodynamics, ME 314		3
Basic Electrical Engineering I, EE 305		3
Water Supply Engineering, CE 327		4
Elective	2	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

Total hours required for graduation **136**
Electives **20**

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
Hydrology, CE 333	2
Open Channel Hydraulics, CE 533	3
Fluvial Hydraulics, CE 534	3
Water Resources Engineering, CE 535	3
Foundation Engineering, 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
Prestressed Concrete, CE 552	3
Adv. Reinforced Conc. Design, CE 556	3
Matrix Anal. of Struct, CE 557	3
Advanced Structural Mechanics, CE 559	3
Highway Engineering, CE 467	3
Construction Engineering, CE 473	3

Construction Methods and Equipment, CE 474 3
Photogrammetry, CE 306 3
Land Surveying, CE 304 3
Special Problems, CE 492 1-3
Special Topics, CE 493 1-3

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.

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.

333 Hydrology 2(2,0) F
Principles of precipitation, runoff, stream flow and ground water. P, EM 331 or concurrently.

336 Engineering Geology 3(2,3)
From an Engineering prospective, the principles of physical and environmental geology; minerals, rocks, weathering, soils, hydrologic cycle, groundwater and frost will be explored and related to engineering applications such as mechanics of unconsolidated materials, slope failures, subsidence, pollution, waste disposal, and exploration methods. P, CE 216.

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 213.

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 213 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, 336, 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.

468 Inspection Trip 0 F
Inspection trip to industrial plants, construction projects, and other engineering sites.

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.

490 Seminar 0(1,0) FS
Current literature on professional and technical aspects of Civil Engineering. P, junior standing. Pass/Fail Grading.

492 Special Problems 1-3 FSSu
Individual investigation. P, consent.

493 Special Topics 1-3 FSSu
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.

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.

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(2,1)
Bearing capacity, load induced pressures and settlements, soil exploration and sampling, lateral-earth pressure, retaining walls, sheet pile structures, pile formations and cassions. P, 446.
546-646 Advanced Soils Engineering 3(2,3) S
Application to engineering problems. Stability, compaction, embankments, seepage, draining, stabilization. P, 446.
552-652 Prestressed Concrete 3(3,0)
Theory and design of prestressed concrete including pre-tensioning and post-tensioning. P, 456.
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, CE 353.
700-701 Seminar 0-1
723 Advanced Sanitary Engineering 3(3,0)
724 Land Treatment of Wastes 3(2,3)
726 Water Quality Analysis 3(1,6) F
P, 327 or consent.
727 Water Treatment Plant Design 3(1,6) F
P, 327 or consent.
728 Waste Water Treatment Plant Design 3(1,6) S
P, 423, graduate standing.
733 Water Resources Engineering 3(3,0) S
P, 433
737 Hydraulic Design 3(3,0) F
P, 433, graduate standing.
738 Advanced Hydraulics 3(2,3) S
P, 433, graduate standing.
749 Structural Dynamics 3(3,0)
P, 353, 456
751 Plastic Design 2(0,6) F
P, 455, graduate standing.
754 Advanced Design of Steel Structures 3(3,0) Alternate years
P, 455, graduate standing.
763 Highway Administration and Economy 3(3,0)
764 Advanced Transportation Engineering 3(2,3)
765 Pavement Design 3(3,0) S
769 Design of Steel and Concrete Bridges 3(3,0) Alternate years
P, 455, 456, graduate standing.
770 Engineering Research or Design Paper 2
790 Thesis 1-7 FSSu
791 Thesis Sustaining 1 FSSu
792 Special Engineering Problems 1-3 FS
793 Special Topics 1-3

Computer Science (CSc)

College of Engineering

Professor Bergum, Head; Associate Professor Lundberg; Assistant Professors Greve, Hovland, Johnson and Instructors Kenner, Lim, Raghuram, Rajkumar.

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 that 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 so as 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 213), MATH 381 (or STAT 341) plus a minimum of 12 credits in Computer Science from courses numbered 285 or above. One related course can be substituted by departmental permission. A grade of "C" or better is required in all minor coursework and a Computer Science minor form must be completed before graduation and filed with the Computer Science Department.

(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 precomputer 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. Application forms for admission into the program can be picked up at the Computer Science Department. Deadline for acceptance is mid-term of the semester preceding entrance. Precomputer science students should apply in April of their Freshman year. Failure to meet the application deadline may disqualify you from enrollment in Computer Science degree courses.

Computer Science majors must earn at least a "C" in CSC 285 and all succeeding computer courses. Applied electives should be chosen so as to provide the student with a strong background for students planning on graduate study or careers in business, industry or teaching. The choice of such courses should be discussed with the major adviser.

Fulfillment of the GPA requirement for admission into Computer Science 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**
Calculus & Analytic Geom., 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 Prog. with Fortran, CSc 213		3
Natural Science Electives	4	4
Electives		1
	16	16

Sophomore Year	**F**	**S**
Matrix Algebra, Math 215	2	
Discrete Structures, Math 243		3
Logic and Set Theory, Math 253	3	
Data Structures, CSc 285		3
Adv. Micro. App., CSc 312	3	
Computer Logic, CSc 241	3	
Computer Languages (PL/1) CSc 316		3
Social Science Electives	3	3
Humanities Electives	3	3
	17	15

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
Intro to Automata Theory, CSc 328		3
Intro to Numerical Computation, Math 373	3	
Social Science Electives		4

Applied Electives****	4	
Electives	1	3
	16	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
	16	16

*May substitute Math 381
**May substitute Engl 303
***From Math 225, 315, 321, 331, 411, 571, or Stat 541
****Courses numbered 300 or above chosen from your field of study with at least nine credits from Computer Science courses numbered 300 or higher.

Undergraduate Courses

110 Programming in BASIC 2(2,0) FSSu
The fundamental concepts of the Computer and the Computer language BASIC will be introduced. That is, decision statements, string manipulation, loops, flow of control, subroutines, user defined functions, random generators, sequential and random access files will be topics covered in the course. P, 1 yr. of high school math.

112 Microcomputer Literacy 2(2,0) FSSu
Computer literacy will be stressed and microcomputers will be used. Topics covered will include the use of a full screen and line editor, elementary DOS commands, use of a word processor, creating a spread sheet, record keeping and creating simple data base. How BASIC is related to the topics above will also be covered. P, 1 yr. of high school math.

114 PASCAL Programming 3(3,0) FSSu
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.

193 Introductory Special Topics in Computer Science 1-3
Courses on such topics as Lotus 1-2-3, advanced Lotus 1-2-3, E-Z Pilot, Logo, computer software applications, computer applications for word processing, advanced computer applications for word processing, keyboarding/introduction to computers, etc. could be offered at off campus sites for college credit.

203 Computers and Society 2(2,0) FS
Impact on the social and cultural environment and daily life. History, use, terminology and computer equipment.

210 Introduction to Computers and Programming 3(3,0) FS
History, operating principles and applications, as well as BASIC programming. P, CSc 110

213 Introduction to Programming with FORTRAN 3(3,0) FSSu
FORTRAN programming for engineering and computer science majors. P, 2 years of high school algebra or equivalent of Math 113.

241 Computer Logic 3(3,0) F
An instruction to computer operating principles, information storage and logic gates. Boolean algebra and other methods of simplying boolean functions are covered to provide an elementary understanding of computer logic analysis and design, suitable for a student at the sophomore level. P, Math 113 or permission. Majors only.

271 Fortran Programming 3(3,0) FS
Gives 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, CSc 114.

285 Data Structures 3(3,0) S
The study of lists, strings, arrays and graph structures within a computer system. An introduction to the various types of data base design philosophy and the advantages and disadvantages. P, CSc 114.

300 Word and Text Processing 3(3,0) FS
The study of complex software such as Symphony and Framework and some special purpose software such as Displaywriter II. Microcomputers and the mainframe will be utilized. P, CSc 114 or CSc 213 or CSc 271.

312 Advanced Microcomputer Applications 3(3,0) FS
Advanced programming techniques utilizing microcomputers including file manipulations, graphics, micro-mainframe data transfer. Hardware topics include: communications, microprocessor designs. P, CSc 114 or CSc 213.

313 COBOL Programming 3(3,0) FSSu
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, CSc 213 or 271 or 114.

314 Computer Operation 3(3,0) FSSu
ASSEMBLY language programming, organization and operating principles of the IBM computer, and others. For students seriously interested in computers or computer programming. P, CSc 114 or CSc 213.

316 PL/1 Programming 3(3,0) FSSu
Introduction to PL/1 programming. Includes scientific and business oriented programming applications, data structures, structured programming and file processing. P, CSc 213 or 271 or 114.

328 Introduction to Automata Theory 3(3,0) FS
Turing machines, computational functions, unsolvability of the halting problem, recursive functions. Finite state models: equivalence, minimization, properties, decision questions, characterizations. Regular expressions. Survey of other automata. P, CSc 114 and Math 243.

354 Introduction to Systems Programming 3(3,0) S
Advanced assembly language 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.

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. P, CSc 314, and CSc 241.

428 Compiler Construction 3(3,0) S
Structure of algorithmic, conversational, list processing and string manipulation languages. Concepts and facilities of programming languages; structure of compilers, introduction to formal languages and parsing. P, CSc 328.

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 Math 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.

510/610 Structure of Higher Level Languages 3(3,0) F
Formal definition of the syntax and semantics of programming languages; semantics both by means of interpreters and by using the axiomatic approach. Concepts underlying programming languages and their instantiations in a selected group of languages. Program description at compilation time and execution time. P, CSc 114, CSc 213 or 271, and CSc 313 or 316.

520-620 Artificial Intelligence 3(3,0) FS
Introduction to ideas, issues and applications of Artificial Intelligence. Knowledge representation, problem solving, search, inference techniques, theorem proving. Expert systems. Artificial intelligence programming languages. P, CSc 510 or 610.

525-625 Digital Systems Hardware Design 3(3,0)

530-630 Principles of Data Base System Design 3(3,0) S
Fundamental concepts. Physical data organization. Data models. Data Manipulation languages. Data base design. Application of data base concepts in design and development of data base systems and applications. Design of current commercial as well as research oriented data base systems. Techniques of using data base systems for application. Security and integrity. Performance evaluation. P, CSc 313 and CSc 316.

547-647 Computer Graphics 3(3,0) F
Principles of computer graphics. A study of the algorithms used to generate raster and vector graphics. P, CSc 213, CSc 285, Math 215, Math 224.

700-701 Seminar 0-1

740 Management Information Systems 3(3,0) FS

790 Thesis 5-7

791 Thesis Sustaining 1
792 Research Report/Design Paper 2

Dairy Science (DS)

College of Agriculture and Biological Sciences

Professor Parsons, Head; Professors Voelker (Emeritus), Schingoethe, Seas, Baker (Emeritus), Spurgeon (Emeritus); Associate Professor Baer, Owens, Bartle (Emeritus); Assistant Professors Mistry, 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 l01	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 361			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 †			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 490	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

Freshman Year	**F**		**S**
Fr Comp, Engl 101,	3	or	3
Fitness & Lifetime Activities, PE 100	1		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	3
Intro to Sociology, Soc 100			3
Group I electives	3		6
Fund of Speech, SpCm 101	3	or	3
Electives	2		
Sophomore Year	**F**		**S**
Macroeconomic Prin, Econ 201	3		
Social Science Elective	3		
Intro Biology, Bio 151, 153	3		3
Elementary Organic Chem, Chem 120	4		
General Microbiology, Micr 231			4
Dairy Products Judging, DS 202			1
Humanities electives	3		
Electives			8
Junior and Senior Years	**F**		**S**
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		4
Dairy Microbiology, DS 301			3
Labor, Law & Econ, Econ 382	3		
Dairy Product Processing I-II, DS 321, 322	5		5
Dairy Plant Management, DS 421	3		
Dairy Seminar, DS 490	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

Freshman Year	**F**		**S**
Fr Comp, Engl 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		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	3
Crop Production, PS 103			3
Fund of Speech, SpCm 101	3	or	3
Dairy Cattle Evaluation, DS 212			2
Electives	2		3

Sophomore Year	F	S
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	3
Social Science Elective		3
Electives		9

Junior & Senior Years	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 323		4
Prin of Animal Breeding, AS 332		4
Dairy Seminar, DS 490	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 BAdm 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, BAdm 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 (1989)
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 (1989)
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 (1990)
Processing or manufacturing of relatively nonperishable dairy products such as butter, cheese, dried milk, casein, lactose, and anhydrous milkfat. P, 321 desirable.

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 (1990)
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) S (1989)
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 (1988)
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) F (1988)
Practical considerations involved in feeding dairy cattle. P. AS 223.

490 Dairy Seminar 1(1,0) F
Review of scientific literature and other items of special interest to dairy majors. P, senior standing.

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.

493 Special Topics 1-4
Selected topics to provide specific knowledge and technical experience in current areas of research and development. Topics may include new processing, breeding or nutrition techniques or product development. P, consent and junior or senior standing.

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 (1989)
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 (1990)
Role of microorganisms in manufacture and spoilage of manufactured dairy product. P, 301 or Micro 311.
702 Seminar 1(1,0) S
711 Ruminology 3(3,0) F (1989)
731 Laboratory Techniques in Dairy Science 2(0,6) F (1988)
780 Dairy Science Problems 1-4 FSSu
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 Lundeen, Head; Professors Dobbs, Gilbert, Greenbaum, Hsia, Kamps, Kim, Lamberton, Lyons, Murra, Peterson, Shane, Taylor; Professors Emeriti Allen, Helfinstine, Kohlmeyer, Myers, Thompson; Associate Professors Goodenow, Janssen, B. Schmiesing; Assistant Professors Beutler, O'Brien, Pflueger, Qasmi, 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 Commercial 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.

Any student majoring in any Economics Department program must complete the following:

	Credit Hours
Econ 201 Macroeconomics Principles	3
Econ 202 Microeconomics Principles	3
Econ 301 Intermediate Microeconomics	3
Econ 302 Intermediate Macroeconomics	3
Econ 330 Money and Banking	3
Actg 210 Principles of Accounting I	3
Stat 341 Statistical Methods I	3
Math 222 Calculus for Non-Math Majors, or 123 Mathematical Analysis I	5
Engl 303 Technical Communications	3
CSc 114 PASCAL Programming	3
Communications elective	2-3
	34-35

In addition to the above, a student majoring in Agricultural Business or Agricultural Economics must complete:

	Credit Hours
AgEc 271 Farm and Ranch Management	4
AgEc 354 Agricultural Marketing	3
AgEc 478 Agricultural Finance	3
AgEc 479 Agricultural Policy	3
	13

Requirements of the individual majors, including those listed above, and suggested study plans are as follow:

Curriculum in Agriculture
Agricultural Business Major[1]
Leading to the Bachelor of Science Degree

Freshman Year	**F**		**S**
Introduction to Sociology, Soc 100	3		
Biological Science elective[2,3]	3		
Algebra, Math 111	3		
Freshman Composition, Engl 101	3	or	3
Fundamentals of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Introductory Physics, Phys 101; or Elementary Physics, Phys 111; or General Physics, Phys 211[3]			4
Group I elective[4]			3
General electives	3		4
	16		15

Sophomore Year	**F**	**S**
Macroeconomic Principles, Econ 201	3	
Humanities electives[2]	3	
General Chemistry, Chem 110 or 112[3]	4	
Principles of Accounting I, Actg 210	3	
Farm and Ranch Management, AgEc 271	4	
Microeconomic Principles, Econ 202		3
Money and Banking, Econ 330		3
Principles of Accounting II, Actg 211		3
Group I elective[4]		2
Calculus for Non-Math Majors, Math 222, or Mathematical Analysis I, Math 123		5
	17	16

Junior Year	**F**	**S**
Junior Composition, Engl 300	3	
Intermediate Microeconomics, Econ 301	3	
Statistical Methods I, Stat 341	3	
PASCAL Programming, CSc 114	3	
Natural Science elective (sequence course)[2,3]	3-4	
Technical Communications, Engl 303		3
Intermediate Macroeconomics, Econ 302		3
Agricultural Marketing, AgEc 354		3
Business Law I, BAdm 350		3
Agricultural Finance, AgEc 478		3
General elective	1-2	
	17	15

Senior Year	**F**	**S**
Communications elective[5]	2-3	
Operations Research, BAdm 326	4	
Humanities elective[2]	3	
Electives in Actg, AgEc, BAdm, or Econ	6	
Managerial Economics, Econ 427		3
Agricultural Policy, AgEc 479		3
Two additional courses prefixed AgEc		6
General electives	0-1	4
	16	16

[1]Students interested in the international option in agriculture should refer to page 33.
[2]Humanities, Social Science and Biological Science electives chosen from the lists 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.
[3]All students must complete two science courses from the same sequence, as identified in the list on pages 15-16.
[4]Group I electives are listed on page 31.
[5]Communication electives must be chosen from Creative Writing, Engl 383; Public Speaking, SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335; Newswriting and Reporting, MCom 210; Publicity Methods, MCom 313; and Magazine Writing and Editing, MCom 315.

Curriculum in Agriculture
Agricultural Economics Major[1]
Leading to the Bachelor of Science Degree

Freshman Year	F		S
Introduction to Sociology, Soc 100	3		
Humanities elective[2]	3		
Biological Science elective[2,3]	3		
Algebra, Math 111	3		
Freshman Composition, Engl 101	3	or	3
Fundamentals of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Introductory Physics, Phys 101; Elementary Physics, Phys 111; or Gen Physics, Phys 211[3]			4
Group I elective[4]			3
General electives			4
	16		15

Sophomore Year	F	S
Macroeconomic Principles, Econ 201	3	
General Chemistry, Chem 110 or 112[3]	4	
Principles of Accounting I, Actg 210	3	
Farm and Ranch Management, AgEc 271	4	
Group I elective[4]	2	
Microeconomic Principles, Econ 202		3
Money and Banking, Econ 330		3
Humanities elective[2]		3
Calculus for Non-Math Majors, Math 222, or Mathematical Analysis I, Math 123		5
General electives		3
	16	17

Junior Year	F	S
Junior Composition, Engl 300	3	
Intermediate Microeconomics, Econ 301	3	
PASCAL Programming, CSc 114	3	
Agricultural Marketing, AgEc 354	3	
Natural Science elective (sequence course)[2,3]	3-4	
Technical Communications, Engl 303		3
Intermediate Macroeconomics, Econ 302		3
Statistical Methods I, Stat 341		3
Agricultural Finance, AgEc 478		3
Mathematical Economics, Econ 428		3
General elective	1-2	
	17	15

Senior Year	F	S
Communications elective[6]	2-3	
Production Economics, AgEc 421	3	
Social Science elective[2,5]	3	
Statistics II, Econ 423	3	
Public Finance, Econ 433		3
Comparative Economic Systems, Econ 405; or History of Economic Thought, Econ 504; or Economic History of the U.S., Hist 377		3
Agricultural Policy, AgEc 479		3
General electives	4-5	7
	16	16

[1]Students interested in the international option in agriculture should refer to page 33.
[2]Humanities, Social Science, and Biological Science electives chosen from the lists 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.
[3]All students must complete two science courses from the same sequence, as identified in the list on pages 15-16.
[4]Group I electives are listed on page 31.
[5]General elective for students who elect to take Hist 377.
[6]Communications elective must be chosen from Creative Writing, Engl 383; Public Speaking, SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335; Newswriting and Reporting, MCom 210; Publicity Methods, MCom 313; and Magazine Writing and Editing, MCom 315.

Economics major and Commercial Economics option

In addition to the courses listed on page 81, any student majoring in Economics, with or without the Commercial Economics option, in the College of Arts and Science must complete:

	Credit Hours
Econ 433 Public Finance	3
Econ 405 Comparative Economic Systems, or Econ 504 History of Economic Thought, or Hist 377 Economic History of the U.S.	3
Electives prefixed Actg, AgEc, BAdm, Econ	6
	12

Curriculum in Arts and Science
Economics Major
Leading to the Bachelor of Arts Degree

Freshman Year	F		S
Algebra, Math 111	3		
Freshman Composition, Engl 101	3	or	3
Fundamentals of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Foreign Language[1]	4		4
Natural Science electives (sequence courses)[2,3]	3-4		3-4
Social Science elective[2]			3
General electives	1-2		1-2
	16		16

Sophomore Year	F	S
Macroeconomics Principles, Econ 201	3	
Principles of Accounting I, Actg 210	3	
Calculus for Non-Math Majors, Math 222, or Mathematical Analysis I, Math 123	5	
Foreign Language[1]	3	3
Microeconomics Principles, Econ 202		3
Money and Banking, Econ 330		3
PASCAL Programming, CSc 114		3
Social Science elective[2,4]		3
*Option courses and general electives	2	1
	16	16

Junior Year[5,6]	F	S
Junior Composition, Engl 300	3	
Intermediate Microeconomics, Econ 301	3	
Statistical Methods I, Stat 341	3	
Technical Communications, Engl 303		3
Intermediate Macroeconomics, Econ 302		3
Mathematical Economics, Econ 428		3
*Option courses and general electives	7	7
	16	16

Senior Year	F	S
Communications elective[7]	2-3	
Comparative Economic Systems, Econ 405; or History of Economic Thought, Econ 504; or Economic History of the U.S., Hist 377	3	
Statistics II, Econ 423	3	
Electives in Actg, AgEc, BAdm, or Econ	3	6
Humanities electives[2]		6
Public Finance, Econ 433		3
*Option courses and general electives	4-5	1
	16	16

*Students can take a **Commercial Economics option** within the Economics major. The courses listed below would become the "Option courses."

Sophomore year	**Credit Hours**
Actg 211 Principles of Accounting II	3

Junior year	**Credit Hours**
BAdm 310 Business Finance	3
BAdm 350 Business Law I	3
BAdm 360 Business Management	3
Econ 353 Marketing	3

Senior year	**Credit Hours**
BAdm 326 Operations Research	4
Econ 427 Managerial Economics	3

Three of the option courses can be substituted for:	**Credit Hours**
Econ 423 Statistics II	3
Econ 428 Mathematical Economics	3
One of the electives in Actg, AgEc, BAdm, or Econ	3

[1]Two years of one foreign language (French, German, Spanish).
[2]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. A minimum of 8 credit hours of Natural Science electives is required.
[3]All students must complete two science courses from the same sequence, as identified in the list on pages 15-16.
[4]General elective if Hist 377 is elected in the choice in the senior year.
[5]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.
[6] All students must complete a minimum of 40 semester hours in courses numbered 300 or above to qualify for the degree.
[7]Communications elective 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.

Curriculum in Arts and Science
Economics Major
Leading to the Bachelor of Science Degree

Freshman Year	**F**		**S**
Algebra, Math 111	3		
Freshman Composition, Engl 101	3	or	3
Fundamentals of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Biological Science electives (sequence courses)[1,2]	3		3
Social Science elective[1]			3
General electives	6		6
	16		16

Sophomore Year	**F**	**S**
Macroeconomic Principles, Econ 201	3	
Principles of Accounting I, Actg 210	3	
Calculus for Non-Math Majors, Math 222, or Mathematical Analysis I, Math 123	5	
Humanities elective[1]	3	
Microeconomic Principles, Econ 202		3
Money and Banking, Econ 330		3
PASCAL Programming, CSc 114		3
Physical Science elective[1,2]		3-4
*Option courses and general electives	2	3-4
	16	16

Junior Year[3,4]	**F**	**S**
Junior Composition, Engl 300	3	
Intermediate Microeconomics, Econ 301	3	
Statistical Methods I, Stat 341	3	
Technical Communications, Engl 303		3
Intermediate Macroeconomics, Econ 302		3
Mathematical Economics, Econ 428		3
*Option courses and general electives	7	7
	16	16

Senior Year	**F**	**S**
Public Finance, Econ 433	3	
Communications elective[5]	2-3	
Comparative Economic Systems, Econ 405; History of Economic Thought, Econ 504; or Economic History of the U.S., Hist 377	3	
Statistics II, Econ 423	3	
Electives in Actg, AgEc, BAdm, or Econ	3	6
Social Science elective[1,6]		3
Humanities electives[1]		6
*Option courses and general electives	1-2	1
	16	16

*Students can take a **Commercial Economics option** within the Economics major. The courses listed below would become the "Option courses."

Sophomore year	**Credit Hours**
Actg 211 Principles of Accounting II	3

Junior year	**Credit Hours**
BAdm 310 Business Finance	3
BAdm 350 Busines Law I	3
BAdm 360 Business Management	3
Econ 353 Marketing	3

Senior year	**Credit Hours**
BAdm 326 Operations Research	4
Econ 427 Managerial Economics	3

Three of the option courses can be substituted for:	**Credit Hours**
Econ 423 Statistics II	3
Econ 428 Mathematical Economics	3
One of the electives in Actg, AgEc, BAdm, or Econ	3

[1]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.
[2]All students must complete two science courses from the same sequence, as identified in the list on pages 15-16.
[3]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.
[4]All students must complete a minimum of 40 semester hours in courses numbered 300 or above to qualify for the degree.
[5]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.
[6]General elective if Hist 377 is elected in the choice above.

Double majors.

Students majoring in Economics Department curricula frequently enroll in and complete more than one major.

Agricultural Business/Agricultural Economics. A student majoring in Agricultural Business must add the following courses to complete an Agricultural Economics major: AgEc 421, Econ 423, 428, 433, and a choice of Econ 405 or 504 or Hist 377.

Conversely, a student majoring in Agricultural Economics must add the following courses to complete an Agricultural Business major: Actg 211, BAdm 326 and 350, Econ 427, and a three credit hour elective prefixed AgEc.

Agricultural Business/Economics (Commercial Economics option). A student majoring in Agricultural Business must add the following courses to complete the Commercial Economics option within the Economics major: BAdm 310 and 360, Econ 353 and 433, a choice of Econ 405 or 504 or Hist 377, a three credit hour Social Science elective, and a three credit hour Biological Science elective (which may have been fulfilled as a Natural Science elective in the Agricultural Business major). Bear in mind that 6 credit hours of International Studies must be included in the Social Science and Humanities electives.

Conversely, a student completing the Commercial Economics option within the Economics major (BS) must add the following courses to complete the Agricultural Business major: AgEc 271, 354, 421, 478, 479, a three credit hour elective prefixed AgEc, five

credit hours of Group I electives, additional Physical Science electives to a minimum of four credit hours each of Physics and Chemistry, and Soc 100. One of the AgEc courses may have been completed as an Economics Department elective and Soc 100 may have been taken as a Social Science elective for the Commercial Economics option.

Preparation for graduate study. Those students planning to pursue a graduate degree in Economics, Agricultural Economics, or Business should consult with their advisers as early as possible to establish a plan of study. Successful completion of graduate study in economics, quantitative methods, operations research, marketing, and finance usually requires an undergraduate plan of study containing additional mathematics courses.

Students wishing to major in any Economics Department program with an additional emphasis on mathematics or statistics for reasons other than preparation for graduate study should also consult with their advisers early in their programs.

*Minor in Agricultural Business	Credit Hours
Econ 201 Macroeconomics Principles	3
Econ 202 Microeconomics Principles	3
Two of the following	6-7
Actg 210 Principles of Accounting I	3
AgEc 271 Farm and Ranch Management	4
AgEc 354 Agric. Marketing and Prices	3
BAdm 310 Business Finance	3
BAdm 350 Business Law I	3
BAdm 360 Business Management	3
Econ 353 Marketing	3
Nine additional credit hours of courses prefixed AgEc, numbered 300 or above	9
	21-22

*Pending Board of Regents approval

Minor in Economics	Credit Hours
Econ 201 Macroeconomics Principles	3
Econ 202 Microeconomics Principles	3
Econ 301 Intermediate Microeconomics, or Econ 302 Intermediate Macroeconomics	3
Two courses selected from courses prefixed AgEc or Econ	6-7
Two additional courses from among	6-8
Stat 341 Statistical Methods I	3
Math 381 Mathematical Statistics	4
Courses prefixed Actg, AgEc, BAdm or Econ	3-4
	21-24

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 adviser.

Courses in the economics department are offered in the following areas: Accounting (Actg), Agricultural Economics (AgEc), Business Administration (BAdm) 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.

320 Cost Accounting 3(3,0)

Purposes and methods of cost accounting as used for planning and control. Budgets, standards, and profitability analysis. Job-order, process, and standard accounting systems. P, Actg. 210.

493 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 credit hours per semester, 7 credit hours per degree.

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.

352 Agricultural Law 3(3,0) S

Legal rights and duties of parties to agricultural business transactions—sales, secured transactions, real and personal property, business associations, labor relations, bankruptcy, water and drainage, and livestock. Emphasis is on South Dakota law. P, BAdm 350, junior standing.

354 Agricultural Marketing and Prices 3(3,0) FS

Principal 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, AgEc 271 and PS 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, AgEc 354 or AS 285 with Econ 202 recommended.

478 Agricultural 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 agribusiness. Implication of agricultural policy alternatives on people living in rural and urban areas. P, 201, 202.

492 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.

493 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 credit hours per semester, 7 credit hours per degree.

Graduate Courses

530-630 Advanced Ag Marketing & Prices 3(3,0) S

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

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, Econ 202, and 2 credit hours CSc 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 (BAdm)

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.

493 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 credit hours per semester, 7 credit hours per degree.

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, 428, Stat 341.

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, BAdm 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, 301.

452 Marketing Management 3(3,0) F

(Offered on demand) Identification and analysis of marketing problems confronting agribusinesses and businesses. Descriptive and analytical techniques are used in a research methods approach. Marketing research techniques are discussed and reviewed. P, 353, Stat 341.

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.

492 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.

493 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 credit hours per semester, 7 credit hours 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 (on demand)

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) F 1988, S 1990

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, and 302 or consent.

560-660 Economic Development 3(3,0) S 1989

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

572-672 Resource Economics 3(3,0) F 1989

Economic analysis applied to problems in allocation, conservation, and development of natural resources. Environmental economics, water and land use, and methods of evaluating projects and programs. P, 202.

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
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 Thesis Sustaining 1
792 Research Paper 2
793 Graduate Special Topics 1-4

Education (Ed)

Division of Education

Professor Jensen, Dean; Professors Edeburn, Everrett, Hanson, Lingren, Widvey; Professor Emeritus Sundet, Scholten; Associate Professors Moeller, Pedersen, Smith, Steinley; Assistant Professors Bell, Bill, Chance, Erion, Fulda, Hofland, Romeriem; Instructors Hopponen, Reisetter, Sheeley.

UNDERGRADUATE TEACHER EDUCATION

Agricultural Education - Professor Hanson, Supervisor
Teacher Education - Associate Professor Steinley, Supervisor
Certification Officer - Professor Edeburn, Supervisor
Clinical Experiences - Professor Widvey, Supervisor

GRADUATE PROGRAMS

M.Ed. - Agricultural Education - Professor Hanson, Supervisor
M.Ed. - Educational Administration - Assistant Professor Chance, Supervisor
M.Ed. - Teaching, Professor Edeburn, Supervisor
M.Sc. - Counseling and Human Resource Development, Associate Professor Smith, Supervisor

The courses in education are divided into the following subheadings: Agricultural Education (AgEd), Adult Higher Education (AHEd), Counseling and Human Resource Development (CHRD), Driver's Education (DrEd), Educational Administration (EdAd), Education, Evaluation and Research (EdER), Educational Foundations (EdFn), Elementary Education (ElEd), Education Psychology (EPsy), 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 South Dakota Division of Education. The professional education requirement is 28 semester credits in education including student teaching vocational agriculture. The student teaching is completed in designated vocational 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	**F**	**S**
General Horticulture, Ho 111	3	
Fitness & Lifetime Activities, PE 100	1	1
Crop Production, PS 103		3
Intro to Animal Science, AS 101		3
Elements of Dairying, DS 130	3	
General Psychology, Psyc 101		3
Introductory Biology, Bio 151, 153	3	3
General Chemistry, Chem 110		4
Fr. Comp., Engl 101	3	
College Algebra, Math 111	3	
	16	17

Sophomore Year	**F**	**S**
Introductory Physics, Phys 101		4
Soils, PS 113		3
Weed Control, PS 343 (F) **OR** Forage Crops & P. Mgmt., PS 313 (F)	3	
Meat: Prod. to Consumption, AS 241	3	
Intro. to Sociology, RS 100		3
Fund. of Speech, SpCm 101		3
Ag. Mechanics, MA 202	2	
One of the following: Elem. Organic Chem., Chem 120; Gen. Microbiology, Micr 231; General Entomology, PS 305; Horticulture Insects, PS 295 (F); Physical Geography I, Geog 131; Plant Pathology, PS 223 (F); Genetics 371	3-4	
Macroeconomic Principles, Econ 201 **OR** Microeconomic Principles, Econ 202		3
Farm Management, Econ 271	4	
Practicum in AgEd, AgEd 301	1	
	16-17	16

Junior Year	F	S
Humanities Elective*		3
Mechanized Agriculture Elective**	3	2
Indians of N. Am., Anth 421 **OR** History of Am. Indians, Hist 368	3	
Animal Science Elective		3
Welding, ES 131		2
Prin. of VocEd & Prac Arts, VTTE 405	2	
Educational Psychology, EPsy 302	2	
Junior Composition, Engl 300		3
Ag Economics/Accounting/Econ Elective**		3
Computers in Teaching, EdFn 385	3	
Communication Elective (See College of Ag. Req.)	2	
	15	16

Senior Year	F	S
Humanities Elective*	3	
Mechanized Agriculture Elective**	3	
Teaching of Reading, SeEd 450	3	
Animal Science Elective**	6	
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
	15	17

*See SDSU approved list.
**Consult approved list available from Agricultural Education.

Undergraduate Courses

301 Practicum 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 completes student teaching, and resumes following student teaching. P, AgEd 301, EPsyc 302, SeEd 450, VTTE 405.

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

510-610 Adult Teaching & Learning 3(3,0) Su
Focus is on the nature and principles of curriculum applied to the adult learner. An overview of methodology and strageties as applied in the instruction of adults is also presented.

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.

600 Special Problems in Extension 2-6
Individually assigned investigative problems in Extension. Individual conference with Laboratory and/or field work. Arrangements with Extension staff must be made prior to registration.

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 and Human Resource Development(CHRD)

Associate Professor Smith, Supervisor

The Counseling and Human Resource Development major is designed to assist the student to develop personally and professionally so that they 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.

Graduate Courses

503-603 School Counseling 3(3,0) SSu
Examination of the counseling process with children and adolescents. The implementation of developmental guidance programs to meet elementary and secondary student's 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.

530-630 Gender Issues in Counseling 3 FSu
Value systems and biases developed in growing up male/female of both client and counselor will be explored in relation to specific topics such as education, therapy, career counseling, sexual abuse, health care and sexuality. Emphasis will be on increasing the counselor's knowledge and awareness of facts and factors unique to gender experience which are relevant to the counseling situation.

551-651 Mental Health and Personality Development 3(3,0) FSu
The nature of personality and developmental theory, mental health issues of children, adolescence and adults with emphasis on programs/strategies for positive mental health. Various personality assessment methods are used.

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 theory is applicable to a variety of clients and to their daily living.

581-681 Workshop
Comprehensive exploration of special areas in an intensive time-frame. Designed to increase specific skills and understandings in a current topic area.

582-682 Seminar 1-3 FSSu
Study in selected areas of counseling, including special investigation, reports and discussion.

590-690 Special Topics 1-3 FSSu
Advanced courses taught upon demand covering such topics as crisis intervention, counseling special groups, cross cultural counseling, various counseling approaches, chemical dependency, etc.

706 Counseling the Victim 3 SSu (even)

713 Administration & Management of Human Services Programs 3(3,0) FSu

721 Counseling Through the Life Span I 3 FSu (odd)

722 Counseling Through the Life Span II 3 SSu (even)

736 Appraisal of the Individual 2(2,0) Su

742 Career Education & Planning 3(3,0) FSu

755 Mental Pathology 3 F

766 Group Counseling 2(2,0) FSSu

770 Student Development: Theory and Practice 3 F

771 Student Personnel Services 3 S

787 Counseling Practicum 3-5 FSSu

788 Group Counseling Practicum 2-4 FSSu

789 Internship in Counseling and Human Resource Development 1-6 FSSu

790 Thesis 1-6 FSSu

791 Thesis Sustaining 1 FSSu

792 Research Problems 2(2,0) FSSu

793 Problems 1-3 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)

Assistant Professor Chance, Supervisor

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 Elementary School Administration 3(3,0)

711 Secondary School Administration 3(3,0)

715 Supervision 3(3,0)

730 School Finance 2,(2,0)

732 School Buildings & Grounds 2(2,0)

735 School Law 3(3,0)

740 Administration of Reading Programs 3(3,0)

781 Workshop 1-3

782 Seminar 1-3(1-3,0)

789 Internship in Ed 1-6(0,1-6)

792 Research Problems in Ed Administration 2(2,0)

793 Problems 1-3

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 Research and Writing 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, education student.

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

505-605 Computers in the Classroom 2(2,0) F
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) S
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 or instructor permission.

520-620 History & Philosophy of Education 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 Human Relations 3(3,0) FSu
Deals with issues surrounding the diversity of populations, both within the schools and in our global society.

551-651 Programming for Gifted and Talented Students 3(3,0) SSu
Examines curriculum methods and materials for gifted and talented children and youth. Students will be exposed to various programming models, IEP development, differentiated curricular concepts, as well as skills and skills in self-directed learning.

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.

700 Working with Exceptional Children 3(3,0) F

727 Group Processes 3(3,0) SSu

744 Research on Effective Schools 3(3,0) FSu

745 Effective Teaching: Theory Into Practice 2(2,0) Su

Elementary Education (ElEd)

Undergraduate Courses

See Child Development and Family Relations

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.

773 Elementary School Curriculum 3(3,0)

Educational Psychology (EPsy)

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, education student.

303 The Exceptional Child 3(3,0) FS
Designed for persons who plan to work with children. This course explores the world of children with special needs. Emphasis is placed on discovering the social, personal and learning characteristics of children with various handicapping conditions.

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.

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 Educatin 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(3,0) Su
Explores the various dimensions of creativity, including what it is, how it develops, how to teach creative students, and how to evaluate creative works.

723 Adolescent Psychology 3(3,0) S

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) FS
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 1(1,2) 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.

410 Classroom Management and Discipline 2(2,0) FS
This course will discuss various learning styles and communication styles that affect classroom learning. Classroom management will be discussed in detail as will several discipline approaches that improve time on task and general classroom atmosphere.

412 Methods of Teaching Social Studies 2(2,0) F
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) FS
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. P, EdFn 339, EPsy 302, junior standing, education student. certification.

488 Supervised Student Teaching in Secondary Schools 8(0,8) FS
Assigned in student's teaching major, or, if appropriate, in teaching minor. Application for student teaching must be made through the Supervisor of Clinical Experiences no later than the second semester of junior year on proper application form. P, senior in Education. Offered second part of semester.

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
Social Science
SeEd 412 Methods of Teaching Social Studies
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 3(3,0)
751 Reading For Content Teachers 3(3,0)
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.

573-673 Special Topics 1-4
731 Administration & Supervision of Voc Ed 3(3,0) Su
743 Special Topics 1-3

Electrical Engineering (EE)

College of Engineering

Professors Ellerbruch, Head; Finch, Knabach, Sander; Professors Emeritus Dracy, Manning, Storry; Associate Professors Gold, Miron, Moore, Pan, Petersen; Associate Professor Emeritus Bruce; Instructors A. Andrawis (on leave), M. Andrawis (on leave), Helder (on leave), Kornbaum, Sawaya

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 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 courses with a "C" average or better: Chem 112, 114; EE 265, 217; EG 121; EM 223; Math 123, Math 224, 225, 321; Phys 211, 213, 331; CSc 213.

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 (11 credits), and required (108 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. The humanistic and social science electives must include indepth course work to meet the 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 head will provide you with an approved list of courses. This list shows how the depth requirement can be met.

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 6 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	
Gen Physics I, Phys 211		4
Fitness & Lifetime Activities, PE 100	1	1
Introduction to Engineering I-II, GE 110-111	1	1
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 213	3	
Introduction to Modern Physics, Phys 331		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, EE 385		4
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	
Technical Communications, Engl 303	3	
Thermodynamics, ME 314 or Phys 341	3	
Electives	x	x

Senior Year	F	S
Linear Control Systems, EE 415	3	
Energy Conversion, EE 430	4	
Energy Lab, EE 434	1	
Engineering Economy, GE 422		2
Senior Design Project, EE 418	3 or	3
Discrete Time Systems, EE 417		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);
Micoprocessor 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. Three credits can be applied as technical electives if your program is an alternate, 2-work experience program.

Electrical Engineering (EE)

Undergraduate Courses

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(3,0) & 3(2,3)
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 deterministics 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.

345 Digital Systems 3(2,3)
Combination and sequential logic theory. Introduction to microprocessors. P, concurrent with EE 321.

365 Electrical Materials II 2(2,0)
Semiconductor and junction theory, semiconductor devices. P, Phys 331, ME 314 or Phys 341.

385 Electromagnetic Field Theory 4(4,0)
Beginning with the experimental results of Coulomb, Ampere, and Farady, 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.

417 Discrete-Time Systems 3(3,0)
Analysis and design of systems implemented with, or controlled by, digital hardware. Topics included are sampling methods, Z-transform, digital filters, SISO control systems, state-space models and MIMO control systems. P, EE 316, EE 415.

418 Senior Design Project 3(2,3)
Capstone senior design project. P, senior standing.

420 Electronics III 4(3,3)
Integrated circuits for switching circuits, digital logic; bistable, astable and monostable mulivibrators; 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 telmetering. 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. P, EE 217 and 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, EE 345.

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.

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.

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.

522-622 RF Electronics 3(3,2)
Performance analysis and design methods for the functional blocks of radio frequency systems operating below the microwave bands. P, EE 321.

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; FORTRAN 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. Date 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.

571-671 Optical Fiber Communications 3(3,0)
Theory and application of optical fibers and communication systems. Topics include fundamentals of optical fiber waveguides, electroluminescent sources, single-mode and multimode, propagation, coupling consideration, photodetectors, signal degradation, fabrication and cabling, and transmission linked analysis. P, EE 316 or consent.

593-693 Special Topics in Electrical Engineering 1-3
P, consent.

690 Special Electrical Problems 1-3
P, consent.

700-701 Seminar 0-1

715 Linear Network Theory 3(3,0)

720 Advanced Digital Hardware 3(3,0)

765 Electrical Properties of Materials 3(3,0)

770 Information & Signal Processing 3(3,0)

785 Microwave Theory 3(3,0)

790 Thesis in Electrical Engineering

791 Thesis Sustaining

792 Engineering Research or Design Paper 2(2,0) FSSu

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, West, Woodard, Williams, Witherington, Yarbrough; Professor Emeritus Brown, Marken, Walz; Associate Professors Brandt, Duggan, Kildahl, Taylor, Veglahn; Associate Professor Emeritus Nagle; Assistant Professors, Haug, Simpkins

The English Department offers instruction in clear thinking and expression, in the history 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

English majors work toward the Bachelor of Arts degree. By taking the required courses in education, they can satisfy the requirements for certification as teachers in secondary schools.

The major requires 36 credit hours in English (not counting English 101 and 300), of which 15 hours must be in British literature and 9 hours in American literature. All majors must take English 321-322. All majors must take one of the following courses in British literature before 1800: 423, 424, 426, 331, 333, 433; one of the following courses in British literature after 1800: 332, 425, 439; and one of the following courses in American literature: 341, 351, 357, 453, 454. All English majors must take a linguistics course (Ling 425 or 543) and either Tech Comm 303 or Creative Writing 383.

All English majors must take History 121 and 122.

All English majors who plan to teach should consult the Dean of the Division of Education before registering for the first semester of their junior year. They must take English 308 and maintain a grade-point average of at least 2.6 in all English courses.

Because high school English teachers frequently are assigned such duties as directing a play, coaching debate, or sponsoring the school paper or yearbook, prospective teachers are encouraged to take appropriate courses in theater, speech or journalism.

Undergraduate Minor Requirements

The English minor requires 20 credit hours in English (not counting English 101 and 300), of which 9 hours must be in British literature and 6 hours in American literature. Minors must also take one of the following courses: English 303, English 383, Linguistics 425, Linguistics 543.

Graduate Study

The Department offers the Master of Arts in English. For details consult the Graduate Catalog.

Related Programs

The English Department coordinates minors in Indian Area Studies and minors in Technical Communications and interdisciplinary Humanities courses. Separate listings explain these courses and programs.

Curriculum in Arts and Science, English Major
Leading to the Bachelor of Arts degree

The following schedule is typical for the English major getting teaching certification. Those who do not plan to teach in public schools should substitute electives for courses marked with an asterisk(*).

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	9
Creative Writing, Engl 383 or Tech Comm, Engl 303		2-3
Structure of English, Ling 425 or 543		3
*Teaching of English, Engl 308		3
*Intro to Am Ed, EdFn 339	2	
*Ed Psychology, EPsyc 302	2	
Elective	3	

Senior Year	**F**	**S**
English or Am Lit Course	3-6	
*Ed Measurements, EdER 415		2
*Methods of Teaching in Secondary Schools, SeEd 400		3
*Classroom Management and Discipline, SeEd 410		2
*Audio-Visual Methods & Materials, SeEd 405		2
*Supervised Teaching in Secondary Schools, SeEd 488		8
*Teaching of Reading, SeEd 450	3	
Electives	6	

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: Grammar Review and Intermediate Composition 3(0,0) FS
Conversation, listening and reading comprehension, vocabulary and idioms, grammar review and intermediate composition.

013 English as a Second Language: More Complex Structural Patterns and Advanced Composition 3(3,0) FS
Conversation, listening and reading comprehension, vocabulary and idioms, more complex structural patterns and advanced composition. P, Engl 003 or placement.

023 English as a Second Language: Listening and Reading Comprehension 3(3,0) FS
Conversation, pronunciation, listening and reading comprehension, vocabulary and idioms, and related composition. 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.

191 Introduction to Creative Writing 3(3,0)
Basic theory and practice in the writing of poetry and fiction. P, Freshman Composition.

203 Advanced Grammer 3(3,0)
Instruction in the theory and practice of traditional grammer including the study of parts of speech, parsing, and practical problems in usage.

213 World Literature Through the Renaissance 3(3,0) F
Literary masterpieces of the western world in English translation.

215 Modern World Literature 3(3,0) S
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.

252 Biography 2(2,0)
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) (Alt. years) 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 English 3(3,0) FS
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 Literary Criticism 3(3,0) (Alt. Years)
The theory and practice of various critical approaches to literature.

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.

312 Juvenile Literature 3(3,0) F
A survey of the history of literature written for children and adolescents, and a consideration of the various types of juvenile literature.

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.

332 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) FS
Writing of fiction, drama, biography, or poetry. P, 12 hours of English and English 300 or consent.

423 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.

424 Poetry and Prose of the English Renaissance 3(3,0) (Alt. years)
Major writers (excluding Shakespeare) of the 16th and early 17th centuries. Emphasis on the works of Milton.

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).

426 Drama of the English Renaissance 3(3,0) (Alt. years)
Major dramatists of the 16th and early 17th centuries, excluding Shakespeare.

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 (1-6)

491 Directed Studies Program (1-9)

493 Undergraduate Course Specials (1-5)

494-495-496 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu

Graduate Courses

NOTE: Junior or senior standing and 16 hours of English are prerequisite to all courses, numbered 500-600 to 590-690 inclusive.

519-619 Comparative Novel 3(3,0)
Selected European novels from Fielding to the present.

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.

706 Research Tools in the Humanities 3(3,0)

707 Speech/English/Drama for Teachers 1-3

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)

758 Modern American Thought 3(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)

790 Thesis

791 Thesis Sustaining

797 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.

Linguistics (Ling)

Undergraduate Courses

425 The Structure of English 3(3,0) F
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) S
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. A faculty committee appointed from several related disciplines advises the Coordinator.

European Studies combines the insights of many disciplines as they are focused on Europe. These disciplines include language and literature, history, art history, philosophy, music, sociology, economics, political science, geography, health science, education, family studies, business and public administration. The topics for the two core courses, Topics in European Culture and Topics in European Society, will vary.

Why European Studies? Because of its interdisciplinary nature and its focus on other cultures, European Studies provides an unusual opportunity for students to realize the goal of an enriching and liberating education. Knowledge and understanding of Europe are important because we live in an interdependent world. All nations share economic, political, and cultural ties with Europe. Many Americans trace their heritage to Europe. Increasing our understanding of the heritage, therefore, gives all of us an understanding and appreciation of our own culture and better prepares us to meet the challenges facing us as a society.

The benefits of the program are as follows: **Cultural Understanding:**European Studies provides students with an opportunity to develop greater understanding of the European cultures which have had a great influence on American culture and on the entire world. **Social Awareness:**Appreciation of the character of various European countries as well as insight into alternative social arrangements comes through examination of the social institutions and policies of other "developed" or "first world" countries. Such awareness of institutions and policies may ultimately help us to choose or reject proposed solutions to problems within our own culture. **Careers/Personal Life:** Students whose career interests focus on Europe through jobs such as trade and commerce, tourism, primary and secondary teaching, positions in multi-national firms and various international agencies will find the European Studies Program provides an introduction to many cultural and social facets of countries where they may later work, tour, live, or study. **Travel:**Background information about European countries, their languanges, history, and people, prepares students for travel on the continent.

The European Studies Program is interdisciplinary. Students are required to take courses in both humanities and social sciences. Many of the courses in the program can be used to satisfy the university core requirements (e.g., French 101 fulfills part of a language requirement. EurS 301 fulfills part of the social science requirement). Therefore, many students can complete the program without adding many more credits beyond the university core. In addition, students may use up to a maximum of eight credits from their majors. The student must take one of each of the interdisciplinary topics courses: EurS 300, Topics in European Culture, and EurS 301, Topics in European Socity (3 credits each).

At least 21 of the 29 credit hours must be from outside one's major department.

While it is not a requirement, living and studying in Europe may also be used to earn some credits.

To enroll in this program, 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.

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 **study** 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: PolS 341 European Democratic Governments	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 383 Francais commercial
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 101-102 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 321-322 English Lit
Engl 331 18th Century English Lit
Engl 332 Early 19th Century
Engl 424 Poetry and Prose of the English Renaissance
Engl 425 Late 19th Century
Engl 426 Drama of the English Renaissance
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
ID 425 Historical Backgrounds of Homes and Furnishings II
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 Emeritus, Dean Emeritus), Beattie, Redhead, Richter, C. Sunde; Associate Professor 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 FL 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.

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.

Majors in the College of Arts and Science are reminded that they must

1. Complete 128 hours of credit.
2. Complete 40 hours of credit in courses numbered 300 or above.
3. Complete 6 hours of International Studies (automatically satisfied with FL course work).
4. Satisfy the Humanities & Social Sciences core areas via at least two disciplines.

Department Recommendations

The Department of Foreign Languages strongly recommends the following be considered when fulfilling elective areas: courses in English Literature; European Studies; Latin American Area Studies; Geography (World Regional Geography); History (courses appropriate to the language area); Political Science (Current World Problems).

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)

Freshman Year	**F**		**S**
Foreign Language (First Year) 101-102	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			

Sophomore Year	**F**	**S**
Foreign Language (Second year) 201-202	3	3
Foreign Language (Composition & Conversation) 311-312	2	2
Natural Science electives	3-4	3-4
Social Science electives	3	3
Electives		

Junior Year	**F**	**S**
Foreign Language (Advanced Courses)	3-6	3-6
Junior Comp, Engl 300	3	
Social Science elective	3	3
Natural Science elective (if not satisfied in sophomore year)		3-4
Electives		

Senior Year	**F**	**S**
Foreign Language (Advanced Courses)	3-6	3-6
Electives		

Curriculum in Arts and Science, Individual Foreign Language Major
Leading to the Bachelor of Science degree

Freshman Year	**F**		**S**
Foreign Language (First Year) 101-102	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			

Sophomore Year	**F**	**S**
Foreign Language (Second Year) 201-202	3	3
Foreign Language (Composition & Conversation) 311-312	2	2
Social Science electives	3	3
Biological Science electives	3	3
Electives		

Junior Year	**F**	**S**
Foreign Language (Advanced Courses)	3-6	3-6
Junior Comp, Engl 300	3	
Social Science elective	3	3
Physical Science elective	4	4
Electives		

Senior Year	**F**	**S**
Foreign Language (Advanced Courses)	3-6	3-6
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.

ıath 111 - Algebra
Econ 201 - Macroeconomics Principles
Econ 202 - Microeconomics Principles Subtotal 9 credits

Choose 4 of the following courses:
Econ 330 - Money and Banking
Econ 353 - Marketing
Actg 210 - Principles of Accounting I
AgEc 354 - Agricultural Marketing and Prices
AgEc 452 - Economics of Grain & Livestock Marketing
AgEc 479 - Agricultural Policy
PolS 351 - International Politics
PolS 356 - International Law/Organization
BAdm 310 - Business Finance
BAdm 350 - Business Law I
BAdm 360 - Business Management
Stat 341 - Statistical Methods Subtotal 12 credits

Choose 1 of the following courses:
Econ 405 - Comparative Economic Systems
Econ 540 - Econ of International Sector
Econ 560 - Economic Development
Econ 572 - Resource Economics Subtotal 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) 1-4(1-4,1)
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)
Provides a broad view of the language and civilization of the designated 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.

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.

490 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.

493 Undergraduate Course Specials 1-5(1-5,0) Refer to the Arts and Science Alternatives and Options statement.

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

560-660 Topics in French, German or Spanish Literature 1-4 (1-4,0)
An intensive examination of a significant writer(s), period or theme in French, German, or Spanish literature. It may be repeated for credit if topic is different.

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.

383 Francais Commercial 3(3,0)
A study of the essential vocabulary used in business and an introduction to the basic workings of French economy. Practical application through writing business letters, applications, publicity, banking forms, etc. and through discussions in French of material studied. P, 202 or consent. On demand.

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.

473 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 literary works from *Manon Lescaut* 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(2,1)
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 2-3(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 2-3(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 bilingual secretaries. P, Span 202. On demand.

466 Hispanic Folk and Popular Literature 3(3,0)
Traditional folk and contemporary popular (written and oral) literature including legends, stories, songs, ballads, last will, testaments, and tombstone writings taught in Spanish. P, 202 or consent.

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.

General Engineering (GE)

College of Engineering

Associate Professor D. Froehlich, Acting Head; Professors Emeriti Anderson, Skubic, H. Svec, Wakeman; Associate Professors Heusinkveld, Sorensen; Assistant Professor Grulke, Kreyger, Weber; Instructors J. Froehlich, Leiferman, R. 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.

A pre-architecture curriculum is offered which allows students to obtain prerequisites for application to professional curriculum of architecture.

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), Electronics Engineering Technology (ET), and Pre-Architecture (ARCH).

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 Introduction to Engineering I 1(1,0) F

Engineering methods of problem solving. Application of computers to problem solving and design. Ethics and professionalism.

111 Introduction to Engineering II 1(1,0) S

Engineering methods of problem solving. Application of computers to problem solving and design. Ethics and professionalism. P, GE 110.

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.

292 Special Topics 1-3 FSSu

293 Special Problems 1-3 FSSu

P, consent.

331 Computer Aided Engineering 2(2,0) FS

Advanced computer aided drafting topics utilizing two and three-dimensional modeling software. Engineering design through introduction of finite element analysis. P, EG 122, EM 221.

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 engnieering 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.

492 Special Engineering Problems 1-3 FSSu

This course will provide individual students the opportunity to pursue technical design problems, extensive literature searches, and individual study of new and timely subjects within the fields of Physical Science and Engineering. P, junior or senior standing in Engineering and consent of instructor.

493 Special Topics in General Engineering 1-3 FSSu

Timely topics relating to Physical Science and Engineering. P, junior or senior standing in Engineering and consent of instructor.

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.

510-610 Human Factors in Engineering and Design 3

Human factors engineering (HFE) - sometimes called ergonomics - deals with optimizing working and living conditions through designing for human use. The central approach of HFE involves the systematic application of relevant information about user characteristics, behavior and expectations in the design of man-made products, equipment, facilities, and environments. The objectives of HFE are (1) to enhance the effectiveness and efficiency of work and other human activities; and (2) to enhance the product users comfort, safety, health and satisfaction. P, Math 111, junior standing or consent of instructor.

520-620 Industrial Safety Engineering 3

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

525-625 Management of Industrial Safety 3

Industrial accidents are caused by error-making human beings. Safety results achieved only through "safety engineering" and OSHA compliance are limited. Optimum levels of accident prevention can only be achieved through a coordinated program of both safety engineering and safety management. The focus on modern safety management includes: Management's direction of safety, measuring safety performance, behavior modification, motivating safety performance, profiling, program organization, products safety, and safety in the adjunct fleet.

700-701 Seminar 0-1(1,0) FS

703 Designing the Workplace for Productivity 3

Designing the workplace to support the structuring of interpersonal communication and action in the workspace and to optimize the use of human energy through the total integration of corporate policy and culture with the physical environment. Includes the evaluation of operation procedures, the construction of behavior, computer assisted facilities management, developing control and order in the workplace, perceived stability as corporate support, flexibility as a catalyst to successful innovation.

790 Thesis 5-7

791 Thesis Sustaining 1

792 Engineering Design or Research Paper 1-2

893 Special Topics 1-3

Engineering Graphics (EG)

The Engineering Graphics courses are provided to satisfy the visualization and graphics communication 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 two and three dimensional shapes. Development of instrument drawing and sketching as a means of design. P, Math 111.

122 Engineering Design Graphics II 1 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 General Engineering Department offers a pre-architecture program. Because of the nature of the profession and diversity of academic offerings, there are numerous paths that one may take toward becoming a licensed architect. The pre-architecture program has enough flexibility to accommodate several of these directions.

Except for a few modifications, the curriculum for architecture is similar to that of the other engineering programs. The course of study is designed on an individual basis according to the student's interests and performance. Students may choose to complete a degree in the College of Engineering and then continue their studies in a master of architecture program at another institution or they may be advised to coordinate their coursework to facilitate transferring directly into another undergraduate program leading to a professional degree. In any case, the pre-architecture program offers counseling and guidance on an individual basis through a pre-architecture adviser.

A suggested First-Year Curriculum is:

First Year	Credit F	Credit S
GE 110 Intro to Engineering I	1	
Math 123 Mathematical Analysis I	5	
Engl 101 Freshman Composition	3	
ArtS 122 Design Fundamentals	2	
ArtH 100 Art & Design Appreciation	3	
GE 293 Architectural Systems	1	
PE 100 Physical Education	1	
GE 111 Intro to Engineering II		1
Math 224 Mathematical Analysis II		4
Spcm 101 Speech		3
ArtS 123 3-D Design		3
ArtS 112 Drawing I		3
EG 121 Engineering Design Graphics		2
PE 100 Physical Education		1

At the completion of one year, a student must decide his or her interest. If architecture is desired, a suggested second year curriculum is presented. If a student's interest is engineering at the end of the first year of the pre-architecture curriculum, the student should transfer to the selected engineering discipline and take the required chemistry courses.

A suggessted Second-Year Curriculum is:

Second Year	Credit F	Credit S
Phys 211 Physics I	4	
CE 211 Materials of Construction	2	
GE 293 Intro to CAD	1	
Design Elective	3	
Art Elective	3	
Social Science Elective	3	
EM 221 Statics		3
GE 293 Architectural Graphics		2
GE 293 Synchronous Systems		2
ArtS 222 Color Theory		3
Technical Elective		3
Design Elective		3

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 vertification 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. Fluid statics. Conservation of mass, energy and momentum. Bernoulli's equation. Flow measurements. Dimensional analysis. Viscosity, introduction to Boundary layer. Laminar, turbulent incompressible flows. Drag, lift. Introduction to compressible flow. P, ME 311 with "C" or better (for ME students only), 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.

724 Theory of Plates & Shells 3(3,0)

731 Advanced Fluid Mechanics 3(3,0)

741 Finite Element Analysis 3(3,0) Alternate years

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 and computer numerical control.

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, computer 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, troubleshoots, 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 Engineerng 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 2(2,0) 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(2,1) F
Radio from a black box-block diagram standpoint. Emphasizes the application of basic circuit concepts to superheterodyne receivers. P, ET 120, or equivalent.

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 principles 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.

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.

430 Video Systems I 3(3,0) F

The study of circuits used in television and video displays. Color and monochrome video systems are studied simultaneously. P, ET 120 or equivalent.

431 Video Systems I Lab 2(0,6) F

Laboratory analysis of the operation of color and monochrome video. Individual circuits of the receiver are experimented with separately. Operation of various test instruments stressed. P, ET 121 or equivalent.

440 Video Systems II 3(3,0) S

Study of circuits used in various video systems. This includes primarily commercial television. Some analysis of VCRs and Video monitors is included. P, ET 430 or equivalent.

441 Video Systems II Lab 2(0,6) S

Laboratory analysis of color TV, monitors, and VCR equipment. Analysis with appropriate test equipment is emphasized. 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.

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 Orientation, GE 110	1	
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
Engineering Design Graphics I, EG 121		2
Fitness and Lifetime Activites, PE 100		1
Engineering Orientation, GE 111		1

Sophomore Year	**F**	**S**
Radio Systems, ET 220	3	
Calculus and Analytical Geometry I, Math 123	5	
Elementary Physics I, Phys 111	4	
Psychology Elective	3	
PASCAL Programming, CSc 114	3	
Logic Circuits, ET 210		2
Calculus and Analytical Geometry II, Math 224	4	
Elementary Physics II, Phys 113		4
Fundamentals of Speech, SpCm 101		3
Humanities Elective		3

Junior Year	**F**	**S**
Digital Computer Fund, ET 374	3	
Advanced Electronics Lab I, ET 375	2	
Discrete & Integrated Devices, ET 302	3	
Special Topics (CAD-Electronics Tech), GE 292	2	
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
Economic Elective		3

Senior Year	**F**	**S**
Video Systems I, ET 430	3	
Video Systems 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, BAdm 360	3	
Elective (Nonrestricted)	2	
Video Systems II, ET 440		3
Video Systems 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 An-Xin, Gritzner, C., Johnson, Landis, Opheim; Associate Professors Draeger, Gritzner J., Sandness, Wilner; Assistant Professors Gab, Loveland, Samuelson.

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	56-58
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)	6
Mathematics (any Math course)	3
Physical Geography, Geog 131 and 132	8
Natural Science elective (from approved list)	2-4
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)	36-38
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
Wl 210 (2); Recr 440 (2); †Electives in the Physical Environment (9); †Electives in the Cultural Environment (9); Total 22 credits.

***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
Physical Science Electives (6); Agricultural Science, Engineering Science, or Math Electives (6); MCom 160 (2); CSc 112 (2); Stat 341 (3); Total 19 credits.

‡Technical Geography — Foreign Language
Advanced Foreign Language (12); MCom 160 (2); CSc 112 (2); Stat 341 (3); Total 19 credits.

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

101 World Place Locations 1(1,0) FS
A basic introductory course designed to provide a solid background in the knowledge of geographical place names, including a discussion of the location of world land masses, water bodies, physical landform features, major cultural features, and political units.

131 Physical Geography I 4(3,2) FS
The earth in terms of its basic physical state. Location, navigation, geodesy, astrogeography, weather and climate.

132 Physical Geography II 4(3,2) FS
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) FS
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.

343 Natural Disasters and Human Hazards 3(3,0) FS
This course provides an in-depth examination of how people respond to natural events such as drought, earthquakes, floods, hail, landslides, lightening, blizzards, tornadoes, hurricanes, and fog as well as a detailed analysis of the effects human actions have on inducing disasters through such means as building in floodplains or on alluvial fans or increasing coastal erosion. P, Geog 131, 132.

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 Land Use Planning 3(3,0) F or S
Geographical patterns of human occupance, 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(2,2) FS
History and principles of cartography. Emphasis on field mapping; map projections; cartographic design; map interpretations; and exercises in map making.

384 Advanced Cartography 3(2,2) FS
This course provides advanced cartographic training techniques as applied to practical applications in field mapping, the production of map projections, cartographic design, and map making. P, Geog 383.

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.

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) FS
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) FS
Development of skills and techniques involved in the interpretation of aerial photographs showing physiography, land use, industrial, commerical and military functions. P, Geo 383 or consent.

484 Remote Sensing 3(3,0) FS
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) FS
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) FS
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.

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.

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 in 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: (Topical) 1-4 FS
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 FS
791 Thesis (Sustaining) 1(1,0) FS
792 Special Problems in Geography: (Topical) 1-4
793 Seminar in Anthropology 1-4 (see Anth 793)

Health, Physical Education and Recreation (HPER)

College of Arts and Science

Professor Forsyth, Head; Professors Booher; Professor Emeriti Crabbs, Huether, Robinson, Williamson; Associate Professors Ewing, Lidstone, Marske, Oien, Richardson; Assistant Professors Erickson, Olson; Instructors Allyn, Charlson, Ekeland, Engels, Haensel, Kool, Neiber, Thorson, Underwood; Adjunct Professor in Cardiac Rehabilitation, Roberts; Adjunct Professors of Sports Medicine, Billion, Holm, Lushbough, Ramsay, 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 to learn skills in carry-over activities promoting 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 substitute the major professional skills courses for the physical education requirement. The following fitness and lifetime activities are offered:

Aerobic Dance, Archery, Badminton, Bowling, Camping Skills, Cross Country Skiing, Cycling, Dance, Fencing, Fishing Techniques, Ice Skating, Individual Fitness, Jogging, Karate, Recreational Activities, Racquetball, Soccer, Social Dance, Softball, Spring Board Diving, Swimming, Scuba, Tennis Volleyball, Weight Training.

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 major, public recreation minor, health education minor, dance education minor, physical education minor, athletic training minor, and the Master of Science degree in Health, Physcial Education, and Recreation. Proficiency in a variety of physical education skills is required.

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 graduation ratio 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 2.0 GPA to be accepted into the Public Recreation major program. Transfer students with less than a 2.0 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 or PE 100 Swimmer's Swimming. 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, 325, NFS 111, PE 351, 354, 450, 460, PT 361, 362, 363, 364, 454, 464, HPER 490, Psyc 101, Hlth 102 or 212, 360 or 385. 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., Iowa, and Minn., 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, HPER 493, 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 a concentration in Elementary Physical Education must complete the following courses: PE 359, PE 360, Danc 130, Danc 131, Danc 132, CDFR 211, HPER 493, 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, 460 or 463; 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, 330, 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 490 (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 instutition, 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

			Credit
Freshman Year	**F**		**S**
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 240	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		
Swimming, PE 320	1		
Humanities, Social Science, or Natural Science electives			
Sophomore Year	**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
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

	Credit		
Freshman Year	**F**		**S**
Fr Comp, Engl 101	3	or	3
Fund of Speech, SpCm 101	3	or	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		
Swimming, PE 320	1		
Humanities & Social Science electives			
Sophomore Year	**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			

*All skills classes should be completed by the end of the junior year.

Junior Year	**F**		**S**
Junior Comp, Engl 300	3	or	3
Ed Psychology, EPsyc 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	or	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 Anth 421	3	or	3
Senior Year	**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 constuming, 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)F
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) S
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 Ballet, Jazz and Tap 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)

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)

491 Directed Studies 1-5
See HPER 491.

492 Problems in Dance 1-3
See HPER 491.

493 Undergraduate Course Specials 1-5
See HPER 491.

494-495-496 Cooperative Education/Internship/FieldExperience (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

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.

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) FS
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 Instruction 3(2,3) FS
See HSc 463

491 Directed Studies 1-9

492 Problems in Health Education
See HPER 491

493 Undergraduate Course Specials 1-5
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 (AY)

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.

490 Senior Seminar 2 credits
Reports, group discussion. Required of recreation majors. P, senior standing or permission.

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.

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 1-12 3(3,0) FS
See description in College of Arts & Sciences.

Graduate Courses

581-681 Workshops in HPER 1-3
Lectures, conferences, 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) S

742 Psycho-Social Aspects of Sports 2(2,0) S

743 Basic Issues in HPER 2(2,0) S

745 Sports Medicine 2(2,0) S

751 Advanced Evaluation in HPER 3(3,0)

760 Motor Learning & Development 3(2,2)

765 Athletic Profiling (2,1) S

774 Supervision of Health, Physical Education and Recreation 2(2,0)

783 Research Methods in HPER 3(3,0)

790 Thesis in HPER 5-7

791 Theseis Sustaining 1

792 Individual Research & Study in HPER 1-4 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) FS
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) FS
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 Emergency Water Safety 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 Swimming Instructor 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. 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.

323 Lifeguard Training 1
The course focuses on skills and knowledge to properly assume responsibilities of lifeguards at swimming pools and non-surf beaches. P, PE 320, CPR and First Aid Certification.

324 Lifeguard Instructor 1
Certification as a Lifeguard Instructor will qualify an individual to teach basic water safety, emergency water safety and the lifeguard training course. P, PE 323.

342 Intramural & Recreational Sports Administration 2(2,0) F
Organization and administration of intramural sports on elementary, secondary, college and university levels. Program planning, facilities, equipment and financing of intramural sports program. P, sophomore standing.

351 Kinesiology 3(3,0) FS
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) FS
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)
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
332 Tennis, Individualized Fitness
Danc 130 Fundamentals of Dance 1(0,3)

Graduate Courses

560-660 Methods & Materials for Elementary Phys Ed 2(2,0)
581-681 Aquatics Workshop 1-3
730 Physical Education Teacher Education 2(2,0) F
750 Applied Exercise Physiology 3(3,0) F
770 Advanced Administration of Interscholastic Athletics 2(2,0) Su
771 Current Trends in Athletics 3(2,2) Su
772 Seminar: Financial Aspects of Sports Management 2(2,0) F

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 reponsibilities 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. The major emphasis of this course will be the assessment of athletic related injuries and conditions. An additional area to be discussed will be managing an athletic training program.
464 Therapeutic Modalities and Rehabilitation 2(2,1)
This course is designed to have the student develop a sound understanding of the use of therapeutic modalities and exercises in the rehabilitation of the injured athlete. 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
792 Individual Research & Study 1-4 credits FSSu
See HPER 792

Recreation (Recr)

Undergraduate Courses

230 Professional Skills 1(0,2) F
See Professional Skills for Majors
241 Intro to Public Recreation 2(2,0) F
Emphasis on the values of leisure experiences which the participant chooses voluntarily with the expectation of positive, enjoyable satisfactions from that participation. Incorporates the impact of these value choices on the individual and society.
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 2(2,0) F
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, Swimmer Swimming.

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.

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(2,0) S
Individual reports and group discussions on recent research and management developments in recreation; employment opportunities and procedures for employment. Taken before the internship.

485 Undergraduate Course Specials 1-5
See HPER 485

491 Directed Studies 1-9 FSSu
Designed to help students learn about individual crafts and the organization and administration of craft centers. P, consent of the Coordinator of Public Recreation.

492 Problems in Recreation 1-3 FSSu
Practicum in a supervised recreational experience with a strong emphasis on leadership and supervisory responsibilities. Required of Public Recreation majors before the internship. P, consent of the Coordinator of Public Recreation.

494-495-496 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu
Planned and supervised professional experience related to recreation administration which takes place outside the formal classroom with public agencies, governmental units or private business. P, consent of the Coordinator of Public Recreation and 2.4 GPA.

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

	Credit		
Freshman Year	**F**		**S**
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		
Fund of Dance, Dance 130	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
Survey of World Art, ArtH 211 or 212	3		
Humanities, Social Science electives			
Sophomore Year	**F**		**S**
Intramural & Rec Sports Adm, PE/Recr 342	2		
Intro to Sociology, Soc 100	3	or	3
Park and Society, PR 201	3		
Macroeconomics, Econ 201	3	or	3
Tennis & Individual Fitness, PE 332	1	or	1
Swimmer Swimming, PE 121, 100 or other PE elective 200 or above	1	or	1
Gen Psychology, Psyc 101	3	or	3
Intro to Philosophy, Phil 205	4	or	4
Physical Geography, Geog 131	4		
General Chemistry, Chem 110	4	or	4
Hist of W. Civ, Hist 121 or 122	3		
Humanities, Social Science elective			
Junior Year	**F**		**S**
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
Environmental Conservation, WL 210	2	or	2
Camp Adm & Counseling, Recr 370	3		
Business Law I, BAdm 350	3	or	3
Advanced First-Aid-Emergency Care, Hlth 360	2	or	2
Directed Studies/Recreation Crafts, Recr 491	2	or	2
Community Recreation, Recr 440			3
Problems in Recreation, Recr 492	3		3
Suggested Electives			
Senior Year	**F**		**S**
State & Local Government, PolS 210	3		
Stagecraft, Thea 141	3	or	3
Publicity Methods, MCom 313	2	or	2
Sailing and Canoeing, Recr 350	2	or	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

	Credit		
Freshman Year	**F**		**S**
Fr Comp, Engl 101	3	or	3
Foreign Language	4		4
Intro to Public Rec, Recr 241	3		
Rec Activities & Golf, Recr 230	1		
Fund of Dance, Danc 130	1		
Fund of Speech, SpCm 101	3	or	3
Rec Leadership, Recr 360			2
Microcomputer BASIC and Literacy, CSc 112	2		
Individual & the Family, CDFR 141	2	or	2
Music Appreciation, Mus 100	2	or	2
Math Elective	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Survey of Art, ArtH 211 or 212	3		
Humanities, Social Science & Natural Science electives			
Sophomore Year	**F**		**S**
Intramural & Rec Sports Adm, PE/Recr 342	2		
Intro to Sociology, Soc 100	3	or	3
Parks and Society, PR 201	3		
Macroeconomics, Econ 201	3	or	3
Tennis & Individual Fitness, PE 332	1	or	1
Swimmer Swimming, PE 121, 100 or other PE elective 200 or above	1	or	1
Hist of W. Civ., Hist 121 or 122	3		
Gen Psychology, Psyc 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

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 212, Hlth 360, HSC 432, 443, and 463 and nine hours of biological science. All minors must consult the head of the Nursing Department for approval. The requirements for the minor are under revision at this time and changes may result.

Undergraduate Courses

102 Community Health 2(2,0)
Discussion based course with the goal of understanding the philosophy and principles of community health. Emphasis on knowledge, attitudes and behaviors utilized in solving community health problems. Open to all students.

212 Contemporary Health Problems 2(2,0)
Personal health education course which focuses on the health problems facing today's society from birth to death. Emphasis on the knowledge essential in maintaining a healthy lifestyle. Open to all students.

252 Disaster Preparedness 2(2,0) (On sufficient demand)
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 (On sufficient demand)
Workshop of 36 hours in effective methods of teaching home care of the sick. Limited to 14 students. P, consent.

302 Wellness and the Family 2(2,0) (On sufficient demand)
Planning for promotion of family health. Open to all students.

440 Epidemiology 3(3,0) (On sufficient demand)
Basic principles applicable to infectious and non-infectious disease. The edidemiologic methods for understanding the patterns of disease and health. P, junior or senior standing or consent of instructor.

442 Seminar (1-4)
Current research and studies emphasizing Public Health terminology, study of reports, and problems. Consent of instructor.

443 Public Health Science 3(3,0) FS
Study of 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. Junior or senior standing or consent of instructor.

452 Workshop 1-4

463 Methods & Materials in Health Instruction 3(2,3)
Curriculum content and methods in health education. Emphasis on elementary and secondary. Demonstration of teaching strategies. Organization of health/safety education. P, HSc 212 or consent of instructor.

494-495-496 Cooperative Education/Internship/Field Experience 1-12
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 head.

Graduate Courses

533-633 Industrial Hygiene 3(3,0)
Industrial hygiene deals with the scope, objectives, and functions of occupational health programs, examines work related diseases, harmful exposure to chemicals and physical agents which may cause discomfort, stress, inefficiency or disease; emphasis on preventive measures to assure a reasonably healthful work environment.

History (Hist)

College of Arts and Science

Professor Bell, Head; Professors Crain, Funchion, Miller, Myers, Sweeney; Professor Emeritus Volstorff

History courses, in addition to their inherent cultural-intellectual value, are designed to prepare majors for careers in teaching, government service, and history-related occupations, and to give a necessary background for graduate work or professinal training in the law. The Department's offerings are also intended to support the academic needs of students as well as to serve the general education interests of the university community.

The History curriculum is made up primarily of American and European courses. However, work is offered in other areas such as Latin America and the Soviet Union in order to enrich the program.

Majors may choose either the bachelor of arts or the bachelor of science program. In addition to departmental requirements, students must also complete all University and College of Arts and Science core requirements appropriate to their degree. Those who intend to teach in the secondary schools must complete the teacher preparation program (for details contact the Division of Education).

MAJOR REQUIREMENTS: Three of the following four courses - Hist 121, Hist 122, Hist 151, Hist 152; and twenty upper division credits to include Hist 380. Total: 29 credit hours.

MINOR REQUIREMENTS: Three of the following four courses - Hist 121, Hist 122, Hist 151, Hist 152; and nine additional credits of which six must be in upper division courses. Total: 18 credit hours.

Please note the following stipulations: (1) no more than six credits in special problems (Hist 492) and cooperative education (Hist 494, 495, 496) may be counted toward the fulfillment of the major and minor requirements; (2) no grade below a "C" in history courses will be accepted in the 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.

151 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.

152 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.

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 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. Primary consideration given to 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 Western and 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 English History 3(3,0)
British history from the Roman occupation to 1688.

342 English History 3(3,0)
A study of 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 America 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.

365 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.

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.

396 Undergraduate Course Specials: (Topical) 1-5 FSSu
See Arts and Science section.

417 History of Latin America 3(3,0)
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 History of Latin America 3(3,0)
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. 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 1-4
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
Organized around a number of major historical problems and issues for graduate study.

Home Economics Education (HE, HEd)

College of Home Economics

Associate Professor Clark, Head; Professor Anderson; Emeritus Professor Gilbert; 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 Office of Vocational and Technical Education of the South Dakota Department of Education.

Graduates of these majors develop abilities in management, planning, communication, and organization. Graduates are employed in a variety of careers related to education including teaching, Cooperative Extension, business, government, community services, and media.

All majors participate in supervised work experiences: 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 an Extension Agent-Home Economics; home economics journalism majors have an internship including supervised media experience.

All majors are encouraged to belong to AHEA, the American Home Economics Association, and to EJE, the departmental club for majors in Home Economics Education, Extension, and Journalism.

A grade of "C" or above must be earned in required home economics, education, or journalism courses to be eligible for graduation with a major in Home Economics Education, Extension or Journalism. 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, Coping Skills for Consumers (2 cr.); HEd 340, Work, Time and Energy Decisions (3 cr.); HE 442, Family Resource Management Lab (3 cr.); HE 361, Home Equipment (2 cr.).

Home Economics Education

Graduates of this major develop abilities in management, planning, communication, and organization. Graduates are employed in a variety of careers related to education including teaching, Cooperative Extension, business, government, and community services.

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

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Sophomore Year

Human Development & Personality I: Childhood, CDFR 211 3
Experience in Human Relations, CDFR 271 3
Occupational Home Economics Experience, HEd 332 1
Special Topics, Early Experience, HE 293 1
Management in Family & Personal Living, HE 241 3
Fitness and Lifetime Activities, PE 100 2
ID Electives 3
NFS Electives 3
‡Approved General Education Elective 3
‡Approved Humanities Electives 6
‡Approved Natural Science Electives (must be science sequence) 4

32

Junior Year

Human Development & Pesonality 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
Teaching Occupational Home Economics Programs, 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

Senior Year

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
†Electives 4
‡Approved General Education Elective 2

33

†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

Graduates of this major develop abilities in management, planning, communication, and organization. Graduates are employed in a variety of careers related to education including Cooperative Extension, business, government, and community services.

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
Human Development & Personality 1: Childhood, CDFR 211 3
Management in Family & Personal Living, HE 241 3
CSc Elective 2
‡Approved General Education Electives 5
‡Approved Humanities Electives 6
‡Approved Natural Science Electives (must be science sequence) 4

31

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 Psyhcology, EdPsy 302 2
Experiences in Adult Education, HEd 421 2
CDFR Electives 3
Home Economics Electives 6

32

Senior Year

Publicity Methods, MCom 313 2
Family Resource Management Lab, HE 442 3
Practicum in Extension, HEd 497 8
Philosophy & Methods, HEd 411 3
Preparation for Student Teaching & Extension Practicum, HEd 412 5
Home Economics Electives 3
†Electives 9

33

†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 media positions with businesses, government agencies, newspapers, magazines, radio and television, universities and other organizations which require persons with a combined knowledge of media and home economics. The courses provide training in reporting and editing, broadcasting, 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 Internship (MCom 495 or HE 495) 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 (must be science sequence) 6
‡General Education Electives 5

32

Sophomore Year

Newswriting, MCom 210 3
Survey of Nutrition, NFS 221 3
CDFR 211, CDFR 312 or CDFR 313 3
HEd Electives 3
Interior Design Electives 3
Textiles & Clothing Electives 3
‡Humanities Electives 6
‡Social Science Electives 3
Electives 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

Senior Year

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 5-9
†Journalism Electives 8-12
†Electives 6-7

32

†Not more than 38 or less than 30 credits may be taken in journalism.
‡Must be university and department approved.
**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 and Consumer Studies.

Home Economics (HE)

Undergraduate Courses

101 Field Experiences 1(1,0) 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. (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 and financial planning. Sophomore or consent.

293 Special Topics 1-3 FSSu
For freshmen and sophomores needing additional study or experience related to a particular topic not offered as part of a regular class. May be repeated for up to three credits. (1 credit, Special Topics, Early Experience, must be taken by HEd majors as a sophomore - only taught in the Fall.)

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 about advertising, consumer practices affecting cost, analysis of programs for consumer protection, the market structure. Principles of maximization of consumer satisfaction.

442 Family Resource Management Lab 1-3 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.

492 Special Problems 1-3 FS

Problems selected according to students' special needs and interests. Can be 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 Cooperative Education/Internship/Field Experience 1-12 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. Consent of department and instructor.

497 Professional Practicum 1-12 FSSu

Directed experimental learning. Consent of department and instructor.

Graduate Courses

500-600 Practicum in Home Economics Related Occupations 2-6
501-601 Seminar 2(2,0)
573-673 Special Problems 1-4, consent.
700 Research Methods in Home Economics 3(3,0)
701 Seminar in Home Economics 0.5-2
790 Thesis 5-7
791 Thesis Sustaining 1(0,1)
792 Problems in Home Economics 2(2,0)
793 Individual Research and Study 5-7
794 Graduate Internship 5-7

Home Economics Education (HEd)

Undergraduate Courses

101 Career Exploration 1(1,0) FS

Discussion and analysis of selected careers in Home Economics and the profession.

130 Coping Skills for Consumers 2(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 Teaching Occupational Home Economics Programs 2(2,0) F

Subject matter preparation to develop competencies desirable for teaching in occupational programs.

332 Occupational Home Economics Experience 1(0,1) F

A work experience to develop competencies desirable for teaching in occupational programs.

340 Work, Time and Energy Decisions 3(3,0) FS

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 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) F

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. P, 2.5 GPA, EPsy 302.

412 Preparation for Student Teaching & Extension Practicum 5(3,2) S 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, EPsy 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(0,8) S Second 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, HEd 412, a 2.6 GPA and senior standing in home economics.

493 Special Topics in Home Economics Education 1-3 FSSu

For persons needing additional experience or study in a particular aspect of the educator's role. Consent of instructor.

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. Consent of department and instructor.

497 Practicum in Extension 8(0,8) FS

Working under supervision in a county extension office. Exploring 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 extension with both young and adults. Full-time residence in a county seat town. P, HEd 412 and senior standing or consent.

Graduate Courses

573-673 Special Problems 1-4
701 Trends in Home Economics Education 2(2,0)
702 Seminar in Home Economics Education 1-2
711 History and Philosophy of Home Economics 2(2,0)
741 Supervision in Home Economics Education 2(2,0)
743 Special Topics 1-3
751 Curriculum in Home Economics Education 2(2,0)
761 Evaluation in Home Economics Education 2(2,0)

Honors Program (HON)

Allen Branum, Director, Nels Granholm, Co-Director; Robert Pengra, Agriculture and Biological Sciences; Kenneth Hillner, Arts and Science; Gary Omodt, Pharmacy; Delores Kluckman, Home Economics; Gary Steinley, Education; Dan Kemp, 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 Prashar; Professors Emeriti Collins, Martin, Peterson; Associate Professors Passineau; Assistant Professors Schaefer, Smith, Spinski; Instructors Baer, Evers; Research Associate Enevoldsen.

The department offers instruction leading to the Bachelor of Science degree with majors in Horticulture, Landscape Design, and Park Management. Courses are offered in Horticulture (Ho), Landscape Design (La), and Park Management (PR).

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

Freshman Year* **	**F**		**S**
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)		

Sophomore Year* **	**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 316	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	

Junior & Senior Years* **	**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 PASCAL 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; 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.

**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[6]

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.

[6]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.

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.

314 Turf Management 3(2,2) S

Maintenance and culture of turfgrass for lawns, parks, golf courses, athletic fields and special purpose turf. P, PS113.

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.

316 Vegetable Growing 3(2,2) F

Methods used by home gardeners and commercial growers in vegetable production. P, Ho 111 or PS 103.

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	**F**		**S**
Fr Comp, Engl 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		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	**F**		**S**
Intro Physics, Phys 101	4		
Fund of Speech, SpCm 101	3		
Woody Plants, Ho 313	4		
Topographic & Route Surveying, CE 201			3
Gen Psychology, Psyc 101	3		
Drawing I, ArtS 112			3
Architectural Design Drafting, EG 223			3
Macroeconomics Principles, 201	3		
Intro Biology, Bio 153			3
Elective*			3

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	F	S
Junior Comp, Engl 300		3
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 314	3	
Landscape Construction, La 323		3
Herbaceous Plants, Ho 311	3	
History of Arch. & Landscape Arch., La 320		3

Senior Year	F	S
Seminar, Ho 470	1	
Planning Public Grounds, La 324	3	
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 outdoor 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 Hort, Ho 111	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
Parks and Society, 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	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	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	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 Parks and Society 3(3,0)F

Introduction to park and recreation resource managment including fundamentals governming 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, liabiity, 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.

Humanities (Hum)

College of Arts and Science

Professor Alexander, Department of English, coordinator.

Humanities courses enable students 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 inter-college program of Native American culture studies. Purposes are 1) to combine courses taught on this campus into an Indian Studies Program; 2) to encourage the enrollment of Native American students by providing a coordinated program in their culture at this university; 3) to provide an opportunity for all university students to learn about the achievements of Native Americans. Courses now approved for 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 Indian 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.

Interior Design (TCID)

(See Textiles, Clothing and Interior Design)

Journalism And Mass Communication (MCom)

College of Arts and Science

Professor Lee, Head; Professor Van Ommeren; Professor Emeriti Markland, Phillips; Associate Professor Egan; Associate Professors Emeriti Abel, Cline, Laird, Wentzy; Assistant Professors Getz, Lundgren, Perpich; Instructors Griesenbrock, Paulson, Westall.

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.

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 began in 1948 and was reaccredited in 1982.

News-Editorial Sequence. Students who want to be reporters or editors for weekly or daily newspapers, magazines, wire 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 newswriting 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 or science 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. Careers also include broadcasting as farm directors, public relations or advertising with agri-business firms, and 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. 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 has 15 Macintosh workstations for reporting classes. Writing labs have a limit of 15 students in order to give close attention to the student. The editing lab 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 eight Macintosh terminals linked to a hard disk and a LaserWriter to provide state-of-the-art desktop publishing facilities. 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 495, 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, Media and Markets 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		

Sophomore Year	**F**		**S**
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

Junior Year	**F**		**S**
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

Senior Year	**F**		**S**
Advanced Editing, MCom 412	1	or	1
Mass Communication Law, MCom 414	3		
Either Mass Media in Society, MCom 572,			3
or Hist. of Journalism, MCom 417	3		
Journalism Internship, MCom 495 (Internship recommended during summer before senior year).	2-4	or	2-4

Additional Required Credits	**Cr.**
Social Science(From approved courses in at least three fields)	24
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. Students must also have 6 semester credits of courses designated International Studies. Three credits are to be in humanities and three credits in Social Sciences as listed in the College of Arts and Science section.

Curriculum in Arts and Science, Journalism Major, News-Editorial Sequence
Leading to the Bachelor of Science degree

Freshman Year	**F**		**S**
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		

Sophomore Year	**F**		**S**
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.

Additional Required Credits	**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. Students must also have 6 semester credits of courses designated International Studies. Three credits are to be in humanities and three credits in Social Sciences as listed in the College of Arts and Science section.

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.

Junior Year	**F**		**S**
Junior Comp, Engl 300	3	or	3
Radio News Reporting, MCom 333	3	or	3
Television News Reporting, MCom 332	3	or	3
Recommended: Public Affairs Reporting, MCom 316			

Senior Year	**F**		**S**
Radio & TV Production, RTVF 331	3		
Mass Communication Law, MCom 414	3		
Either Mass Media in Society, MCom 572,			3
or History of Journalism, MCom 417	3		
Journalism Internship, MCom 495	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. Courses listed as RTVF count as journalism courses. 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. Students must also have 6 semester credits of courses designated International Studies. Three credits are to be in humanities and three credits in Social Sciences as listed in the College of Arts and Science section.

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

Sophomore Year	**F**		**S**
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

Junior Year	F		S
Junior Comp, Engl 300	3	or	3
Principles of Advertising, MCom 370	3		
Advertising Copy and Layout, MCom 371			3
Media and Markets, MCom 372			3

Senior Year	F		S
Advertising Campaigns, MCom 473	3		
Mass Communication Law, MCom 414	3		
Either Mass Media in Society, MCom 572			3
or History of Journalism, MCom 417	3		
Journalism Internship, MCom 495	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. Students must also have 6 semester credits of courses designated International Studies. Three credits are to be in humanities and three credits in Social Sciences as listed in the College of Arts and Science section.

Curriculum in Agriculture, Agricultural Journalism 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 110	4		
Algebra, Math 111 or Algebra & Trigonometry, Math 113	3-5		
Intro to Sociology, Soc 100			3
Biological Science	3-4		3-4
Intro Physics, Phys 101 or Elementary Physics I, Phys 111 or General Physics I, Phys 211			4-5
Agri Group I elective (See College of Agriculture listing)	3		3

Sophomore Year	F		S
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

Junior Year	F		S
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		
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

Senior Year	F		S
Mass Communication Law, MCom 414	3		
Advanced Reporting, MCom 410	3		
Journ Internship, MCom 495	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

Freshman Year	F		S
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

Sophomore Year	F		S
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

Junior Year	F		S
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	3	or	3
Magazine Writing & Editing, MCom 315	3		

Senior Year	F		S
Advanced Reporting, MCom 410			3
Mass Com Law, MCom 414	3		
Journ Internship, MCom 495	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. All students are required to have 40 semester credits of upper division courses. Students must also have 6 semester credits of courses designated International Studies. Three credits are to be in humanities and three credits in Social Sciences as listed in the College of Arts and Science section.

Courses are listed under the following headings: Mass Communication (MCom); General Communication (GCom); Radio, Television and Film (RTVF) (in Speech section); and Printing (Prtg).

Journalism & Mass Communication (MCom)

Undergraduate Courses

151 Intro to Mass Com 2(2,0) FS
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, desktop publishing, graphics.

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) F
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.
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) FS
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; RTVF 330 for others.
336 Radio News Laboratory 1-3 FS
Gathering, writing, editing and producing daily stories for KESD-FM. P, 333 for majors; RTVF 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 Media and Markets 3(2,3) S
Selection of media and markets in advertising strategy. P, 370 or consent.
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.
473 Advertising Campaigns 3(3,0) F
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.
491 Directed Studies
492 Special Problems in Journalism 1-3 FSSu
P, Senior Standing
493 Undergraduate Course Specials
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

505-605 Theories of Communications 3(3,0) S
Major theories of communication, including media and interpersonal communication.
506-606 Public Opinion and Propaganda 3(3,0) S
Formation and measurement of public opinion; role of the media; propaganda techniques, agencies, theories. P, Senior standing, consent.
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.
610 Seminar in Mass Communications 2(2,0) FS
651 Special Problems in Communications 1-3 FSSu
P, consent.
653 Workshop in Communication 1-3 Su
790 Thesis in Journalism 1-6 FSSu
791 Research Methods in Communications 3(3,0) F
792 Research Methods in Communications 3(3,0) S

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; Professor Emeritus, Phillips; Associate Professor Emeritus Abel; Assistant Professor Lundgren; Instructor Westall

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, computer science and graphic design 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.

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 head 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.

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.

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

Sophomore Year	**F**		**S**
Typography, Prtg 211	3		
Photography, MCom 160	2	or	2
Bindery, Finishing and Distribution Prtg 212			3
Newswriting & 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

Junior Year	**F**		**S**
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

Senior Year	**F**	**S**
*Manufacturing Control, Prtg 413		3
*Estimating, Prtg 411		3
Production Management in Graphic Arts, Prtg 414	3	
Tone and Color Reproduction, Prtg 415		4

Additional Required Credits for degree	**Cr.**
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. Students must also have 6 semester credits of courses designated International Studies. Three credits are to be in humanities and three credits in Social Sciences as listed in the College of Arts and Science section.

Curriculum in Arts and Science, Printing-Education Major
Leading to the Bachelor of Science degree

Freshman & Sophomore Years
Same as Printing Management.

Junior Year	**F**		**S**
Junior Comp, Engl 300	3	or	3
Practicum & Professional Lab Experiences, SeEd 339	2		
Gen Psychology, Psyc 101	3		
Biological Science	3		3
Intro to American Education, EdFn 339			2
Ed Psychology, EPsyc 302			2

Additional Required Credits	**Cr.**
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.

Junior Year	**F**		**S**
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		

Senior Year	**F**		**S**
Mass Com Law, MCom 414	3		
Sr. Research Problems, MCom 490	2	or	2
Printing Internship, Prtg 495	2-4	or	2-4
*Sales, Promotion, and Marketing Prtg 314			3

Additional Required Credits	**Cr.**
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. Students must also have 6 semester credits of courses designated International Studies. Three credits are to be in humanities and three credits in Social Sciences as listed in the College of Arts and Science section.

Undergraduate Courses

111 Basic Presswork 3(2,4) F
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) F
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) S
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, international business and 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 356	3
Spanish Am Civilization, Span 436	2
20th Century Spanish Am Lit, Span 484	3
Directed Study in Spanish, Span 491 (oriented toward Latin America)	1-3
(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 313	3
(LAAS courses)	
Latin Am Cultures (Topical), LAAS 301	3
Latin American Societies (Topical), LAAS 302	3
Directed Studies in Latin Am Cultures, LAAS 491	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
Econ. of the International Sector, Econ 540	3
Current World Prob, PolS 253	3
International Politics, PolS 351	3
International Law & Organizations, PolS 356	3
Political Philosophy, PolS 461	3
Modern Political Theory, PolS 462	3
Cultural Anthropology, Anth 320	3
Gen Anthropology, Anth 200	3
Population Problems, Soc 362	3
Community Development, Soc 540	3
Am Diplomatic History, Hist 467	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, Kemp, Lacher, Monahan, Nielsen; Professors Emeriti Kranzler, Nelson, Trapp, Wente; Associate Professors Ayers, Broschat, Bryn, Clever, Vandever; Assistant Professors Roe, Schmidt, Struck, Yokota; Instructors Gnirk, Gustin, Monsees; Adjunct Assistant Professors Elliott, Johnston.

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 34 semester credits in mathematics while the B.S. major requires 37. 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 or 112 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.

Credit may be earned for both Math 111 and Math 112 or in both Math 111 and 113 if taken in that order. Credit will not be allowed for both Math 112 and and 113 or for both Math 113 and Math 120. Credit will not be allowed for both Math 123 and Math 222.

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
Calculus & Analytic Geometry I, Math 123	5
Foreign Language*	8
Fitness and Lifetime Activities, PE 100	2
Social Science electives**	3
Electives	3
	32

Sophomore Year	
Calculus & Analytic Geometry II, Math 224	4
Calculus & Analytic Geometry III, Math 225	3
Elem Logic & Sets, Math 253	3
Foreign Language*	6
Social Science electives**	6
Humanities electives**	3
Computer Programming (CSc 112, CSc 114, or Math 271)	2-3
Electives	4-5
	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
Directed Studies, Math 491	1
Humanities electives**	3
Electives	21
	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
Calculus & Analytic Geometry I, Math 123	5
Chem 110 or 112	4
Biol Sci electives	6
Fitness and Lifetime Activities, PE 100	2
PASCAL Programming, CSc 114	3
	31

Sophomore Year	
Calculus & Analytic Geometry II, Math 224	4
Calculus & Analytic Geometry III, Math 225	3
FORTRAN Programming, Math 271	3
Elem Logic & Sets, Math 253	3
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
	32

Senior Year

Math Electives (300 level or above)	6
Directed Studies, Math 491	1
Electives	25
	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
Junior Year	
Intro to AmEd, EdFn 339	2
Ed Psyc, EPsyc 302	2
Computers in Education, EdFn 385	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

010 Basic Algebra 3 FSSu

Integers, Rational numbers, signed numbers, absolute values, and basic operations. Solving algebraic equations and inequalities in one variable with applications. Basic operations applied to polynomials, special products and factoring. Algebraic fractions, square roots and radicals.

111 Introductory College 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 112 or 113. P, 1 unit of high school algebra.

112 College Algebra 3(3,0) FS

Basic properties of real numbers. Solutions of linear, quadratic, and rational equations and inequalities. Exponents and radicals, factors, graphing, and real zeros of polynomials. Systems of equations, exponentials, logarithmic, and inverse functions. Other topics selected from sequences, series, and complex numbers. Credit will not be allowed for both Math 112 and 113. P, 1 1/2 units of high school algebra or 111.

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 112 or 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.

123, 224, 225 Calculus & Analytic Geometry 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, recurrance systems, analysis of algorithms and algebras. P 113,271 or CSc 114 or 213.

253 Elementary Logic & Set Theory 3(3,0) FS

Logical connectives, constants, variable, quantifiers, arguments, and proof. Set operations, index sets, relations, functions, cardinality, and mathematical induction. P, 123.

271 FORTRAN Programming 3(3,0) FSSu

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, CSc 114.

313 Modern Algebra 3(3,0) FS

Groups, rings and fields. Homomorphism theorems. P, 224, 253 or consent.

315 Linear Algebra 3(3,0) FS

Vector spaces, linear transformations and matrices. P, 215, 253 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.

327 Calculus of Several Variables 3(3,0) S

Calculus of functions of 2 and 3 variables starting with a review of Partial Derivations and Multiple Integration, and including the Implicit Function Theorems, Jacobians, Improper Integrals, Vector Field Theory, and Stokes' Theorem. P, 215, 225 or consent.

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.
355 Methods of Teaching Mathematics 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 and SeEd 287.
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, CSc 114 or 213.
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, Fermats theorem, Wilson's theorem, quadratic residues, primitive roots, Pell's equations, continued fractions, distribution of primes. P, 224, 253.
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 interated sequences, continuity, uniform continuity, derivatives in Rp, directional derivatives, partial derivatives, Riemann-Stieltjes integral content, integration in Rp, Green's Theorem, improper and infinte integrals, infinite series, power series, M-Test. P, 225, 253.
433 Laplace Transform 3(3,0) (On demand)
Main features of Laplace transform theory. P, 321 or consent.
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

551-651 Intro to Topology 3(3,0) S
A first course in point-set topology, covering the elementary concepts of metric and general topological spaces; closure, interior, boundary, connectedness, compactness, and separation. Special attention is given to continuity of functions.
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 interative methods and boundary value problems for ordinary and partial differential equations. P, 571-671.
700/701 Seminar 1 FS
716 Theory of Algebraic Structures I 3(3,0) F
717 Theory of Algebraic Structures II 3(3,0) S
726 Real Variables I 3(3,0) F
727 Real Variables II 3(3,0) S
728 Complex Variables I 3(3,0) F
729 Complex Variables II 3(3,0) S
731 Ordinary Differential Equations 3(3,0) F
732 Partial Differential Equations 3(3,0) S
784 Applied Probability Theory 3(3,0) F
790 Thesis 5-7 FSSu
791 Thesis Sustaining 1 FSSu
792 Research Paper 2 FSSu
793-794 Advanced Topics 1-3 FSSu
795 Special Problems 1-3 FSSu

Mechanical Engineering (ME)

College of Engineering

Professor H.S. Ghazi, Head; Professors K.D. Christianson, Knofczynski; Associate Professors H. Hamidzadeh, R.P. Mikesell, A. Moutsoglou; Assistant Professor F. Delfanian (on leave); Instructor K. Bassett.

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 the department head, and must total at least 12 credits, including one elective design course.

A minimum of six credits of Humanities and nine credits of Social-Sciences are required and are selected from courses listed in the Humanities and Social-Sciences sections under the Graduation Requirements in this catalog. These courses 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 grade requirements must be met to earn a Bachelor of Science Degree in Mechanical Engineering: a combined average of "C" or better in the Mechanical Engineering courses; a combined average of "C" or better in the Mathematics courses; a minimum grade of "C" in each of the following courses: Math 123, Math 224, Phys 211, ME 311, ME 312 and all EM designated courses.

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

	Credit	
Freshman Year	**F**	**S**
Mathematical Analysis I-II Math 123-224	5	4
General Chem, Chem 112-114	4	3
Fr Comp, Engl 101, or Speech, SpCm 101 (either order)	3	3
Engineering Design Graphics I-II, EG 121-122	2	1
General Physics I, Phys 211		4
Fitness & Lifetime Activities, PE 100	1	1
Orientation for Engineers, GE 110-111	1	1
Electives	2-3	
Sophomore Year	**F**	**S**
Mathematical Analysis III, Math 225	3	
General Physics II, Phys 213	4	
Statics, EM 221	3	
Metal Processing, ES 225	1	
FORTRAN, CSc 213	3	
Engineering Materials, ME 241	3	
Differential Equations, Math 321		3
Dynamics, EM 222		3
Fund. Mechanical Design, ME 240		3
Thermodynamics I, ME 311		3
Intro to Literature, Engl 218		3
Electives		2-3
Junior Year	**F**	**S**
Mechanics of Materials, EM 321	3	
Fluid Mechanics, EM 331	3	
Adv. Eng. Math; Math 331, or Math. Stat., Math 381	3 or	4
Composition, Engl 300	3	
Thermodynamics II, ME 312	3	
Heat Transfer, ME 415		3
Basic Electrical Engineering I-II, EE 305-306	3	3
Kin. & Dyn. of Mach. Elements, ME 321		3
Instrumentation Lab, ME 376		2
Electives		5-6
Senior Year	**F**	**S**
Design of Machine Elements, ME 421	4	
Design of Thermal Systems, ME 418	3	
Vibrations, ME 322	3	
Thermo-Fluids Lab, ME 476	1	
Inspection Trip, ME 480	0	
Automatic Controls, ME 451		3
Mechanical Systems Design, ME 477		3
Electives	5-6	8-9

Technical Electives (12 credits)

ME 341	Metallurgy	3
ME 362	Industrial Engineering	3
ME 411	Environmental Engineering	3
ME 412	Internal Combustion Engines	3
ME 413	Turbomachinery	3
*ME 419	Heating & Air Conditioning Design	3
*ME 428	Machine Design - Case Studies	3
ME 431	Aerodynamics	3
*ME 461	Analysis & Design of Industrial Systems	3
ME 492	Special Problems (on sufficient demand if faculty loads allow)	1-5
*ME 493	SORD (Student Originated Research & Design) Projects	3
ME 493	Special Topics (on sufficient demand if faculty loads allow)	1-5
CE 327	Water Supply Engineering	4
Math 331	Advanced Engineering Math	3
Math 381	Mathematical Statistics	4
Phys 331	Intro to Modern Physics	3
Phys 433	Intro Nuclear Physics	3
Phys 535	Reactor Physics	3

Others on approval.

*Design electives

Undergraduate Courses

240 Fundamentals of Mechanical Design 3(3,0) FS
Introduction to the design process, statement of problem, modeling, research, interaction of system components. Economic, social, environmental and manufacturing constraints. Factor of safety, reliability. Utilization of graphics. Design project. P, EM 221, concurrent ES 225.

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, Chem 114.

311 Thermodynamics I 3(3,0) FS
Thermodynamic properties of gases, vapors and mixtures. Zeroth, First and Second Laws of Thermodynamics. Entropy. Availability and irreversibility. P, Phys 211, Math 225.

312 Thermodynamics II 3(3,0) FS
Thermodynamic power cycles using vapors and gases. Refrigeration cycles. Mixtures and psychrometry. Stoichiometry. Compressible and incompressible flow through nozzles and flow meters. Thermodynamic relations. P, ME 311, Math 321.

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. Introduction to heat transfer. 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. Computer applications. P, CSc 213, EM 222, ME 240, ME 311.

322 Vibrations 3(3,0) FS
Free and forced vibration of single-degree-of-freedom system. Vibration measurement. Vibration transmission and isolation. Multi-degree-of-freedom systems, matrix methods, vibration control and damping treatments. Introduction to continuous systems. P, EM 222, EM 321, Math 321.

341 Metallurgy 3(1,4) F
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, ME 241 and consent.

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) F
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 213, ME 311.

376 Measurements and Instrumentation Lab 2(1,3) FS
Instruments for measuring pressure, temperature, flow, strain, vibration and sound. Experimental data analysis for accuracy, error and uncertainty. P, ME 311, Engl 300 or 303.

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, ME311 or consent.

411 Environmental Engineering 3(3,0) F
Comfort and health requirements for space conditioning. Psychrometrics, steady-flow processes involving air-vapor mixtures. Heating and cooling load calculations. Basic air conditioning systems. Emphasis on systems design approach. P, EM 331, ME 312, concurrent ME 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, ME 312, EM 331.

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, ME 312, EM 331.

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. P, ME 311, EM 331, Math 321.

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, ME 415.

419 Heating and Air Conditioning Design 3(2,2) S
Analysis of heating and air conditioning equipment. Design of heating and air conditioning systems. Economic considerations. Use of computers as design aids. P, senior standing or consent.

421 Design of Machine Elements 4(4,0) FS
Fundamentals of mechanics. Energy methods. Working stresses and failure in materials. Design considerations of basic machine elements - shafts, springs, belts, clutches, brakes, chains, gear, bearings, fasteners and flywheels. Lubrication. Classification of engineering materials. P, ME 321, EM 321 with "C" or better.

428 Machine Design - Case Studies 3(1,5) S
Study of stress and strain as applied to mechanical engineering problems. Residual stresses and dynamic loading. Theories of failure. Design of components that form a complete working system. Design analysis of various current case studies. P, ME 421.

431 Aerodynamics 3(3,0) S
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) S
Modeling of mechanical, electrical, hydraulic and pneumatic systems. Laplace transform and system response. Transfer functions; control systems and frequency response. System analysis using polar, logarithmic and Root locus plots. System compensation. Introduction to nonlinear controls. P, ME 322, concurrent EE 306.

461 Analysis & Design of Industrial Systems 3(3,0) S
Problems in product design and development, marketing, forecasting, capacity evaluation, plant layout, materials handling from standpoint of interrelated and integrated systems. P, 362.

476 Thermo-Fluids Laboratory 1(0,3) FS
Experiments in fluid mechanics, thermodynamics and heat transfer. Single and multi-stage compressors. Heat pumps and air conditioning. Blowers and flow measurements in ducts. P, ME 376, ME 312; EM 331, concurrent with ME 415.

477 Mechanical Systems Design 3(1,5) FS
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 design they have attempted. P, ME 421, Math 321.

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.

490 Seminar 1(1-0)*
Recent research and development in mechanical engineering, related fields. 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

527-627 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, EM 331, Math 331.

540-640 Computer-Aided Design 3(3,0)
The use of digital computer as a design tool. Techniques and algorithms which increase the rationality of the design process. Design principles and optimization theory. General approach to constrained optimization. Probabilistic approaches to design. Computer-aided design to reliability specification. Application of computer graphics to engineering design. The emphasis is on extending the designer's potential and not on automating his/her activities. P, competence in FORTRAN programming and consent.

690 Special Problems 1-5

695 Special Topics 1-3

700/701 Seminar 0-1

703 Thermo-Fluid Energy Systems 3(3,0)

706 Statistical Thermodynamics 3(3,0)

711 Advanced Heat Transfer I 3(3,0)

721 Viscous Flow Theory I 3(3,0)

728 Gas Dynamics II 3(3,0)

731 Advanced Analytical Methods 3(3,0)

735 Modeling & Simulation of Dynamic Systems 3(2,3)

739 Advanced Metallurgy 3(3,0)

741 Advanced Stress Analysis in Mechanical Design 3(3,0)

745 Advanced Machine Design 3(3,0)

761 Intro to Operations Research 3(3,0)

762 Quality Control & Reliability 3(3,0)

763 Topics in Reliability Engineering 3(3,0)

765 System Analysis 3(3,0)

767 Decision Theory 3(3,0)

790 Thesis 5-7 as arranged

791 Thesis Sustaining

792 Research or Design Paper 2 FSSu

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, Moe, Pahl, Wiersma; Associate Professors Durland, Froehlich, Ullery, Werner; Assistant Professors Alcock, Anderson, Bender, Julson, Kelley, Schipull, Stange; Instructor 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

		Credit
Freshman Year	**F**	**S**
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	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
Sophomore Year	**F**	**S**
Chemistry elective (Not Chem 100)	3	
Mathematics of Finance, Math 241		3
Engineering Design Graphics, EG 121	1	
Soils, PS 113		3
Farm Power Units, MA 213	3	
Microcomputer Literacy, CSc 112		2
Principles of Actg I, Actg 210		3
Group I elective*	6	3
Humanities Elective‡		3
Social Science Elective‡	3	
Junior Year	**F**	**S**
Junior Composition, Engl 300**		3
Electricity for Farm and Home, MA 342	3	
Econ 201 or Econ 202	3	
Soil & Water Mechanics, MA 333		3
Elementary Physics I-II, Phys 111-113	4	4
Farm Mach. & Hydral., MA 313		3
Elective & Option courses	4	4
Humanities Elective‡	3	
Communication Elective**		2
Senior Year	**F**	**S**
Farm Building Mechanization, MA 423		3
Processing, Equipment & Agricultural Products, MA 443	3	
Physical Climatology & Meteorology, AE 353		3
Business Law, BAdm 350	3	
Technical elective***	3	
Elective		3
Seminar, AE 471	1	
Elective & option courses	6	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 Sciences 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, BAdm 360	3
Statistical Methods I, Stat 341 or equivalent	3
Business Finance, BAdm 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, Psyc 101	3
Educational Psychology, EPsyc 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 appplied 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, BAdm 310 3
Personal Finance, BAdm 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 Units 3(2,2) FS
Operation and maintenance of large and small spark ignition engines and diesel engines. Proper selection of tractors with respect to: horsepower, fuel efficiency, safety, cost of operation, traction and power train type will be covered. P, Math 111.

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.

273 Micro-Computer Applications in Agriculture 3(2,2) S
Explains basics of micro/transducer/control interfacing as used for farm machinery and equipment. Popular agricultural software, data management for agricultural applications will be explored. Pratical experience in monitoring and controlling agricultural processes, equipment and systems.

313 Farm Machinery and Hydraulics 3(2,2) S
Farm machine selection, operation, and adjustment for efficient operations. Principles of fluid power, hydraulic systems and components, microprocessor and electro-hydraulic and pneumatic operation and controls. P, Physics 101 or 111-113.

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 3(2,2) 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.

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.

492 Special Problems 1-3
Must have approval of adviser and department head.

493 Special Topics 1-4

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 1988)
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 1988)
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 1989)
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 1989)
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 1989)
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 Hillam, Pengra, Sword, Westby; Professors Emeritus Baker, Semeniuk; Associate Professors Kirkbride; Assistant Professors Gibbons, 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), Microbial Genetics (Micr 436) and Immunology (Micr 422).

Completion of 16 cr (to include Micr. 231, and either Micr 332, Micr 436 or Micr 422) can constitute a **minor**.

In addition, Chem 112-114, Chem 326-328 (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		
Freshman Year	**F**		**S**
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
Sophomore Year	**F**		**S**
Soils, PS 113			3
Organic Chemistry, Chem 326-328 (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
Junior Year	**F**		**S**
Elementary Physics, Phys 111-113	4		4
Group I Agriculture electives	3		3
Humanities electives (approved list)	3		3
Microbial Genetics, Micr 436	4		
Microbiology elective			3
Junior Composition, Engl 300			3
Immunology, Micr 422	4		
Social Science elective (approved list)			3
Senior Year	**F**		**S**
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		
Freshman Year	**F**		**S**
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
Sophomore Year	**F**		**S**
Organic Chemistry, Chem 326-328 (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
Junior Year	**F**		**S**
Junior Composition, Engl 300			3
Elementary Physics, Phys 111-112	4		4
Humanities electives (approved list)	3		6
Biochemistry, Chem 260	4		
Microbial Genetics, Micr 436	4		
Microbiology elective			3
Immunology, Micr 422	4		
Electives	1		2
Senior Year	**F**		**S**
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		
Freshman Year	**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		
*Calculus for non-Math Majors, Math 222 (or general elective)			5
Sophomore Year	**F**		**S**
Organic Chemistry, Chem 326-328 (or Organic Chemistry, Chem 120 & Chem elective)	4		4
*Statistical Methods I, Stat 341 (or general elective)	3		
Genetics, Bio 371	3		
General Microbiology, Micr 231	4		
Microbial Physiology, Micr 332			4
Macroeconomics Principles, Econ 201	3		
Introduction to Sociology, Soc 100			3
Communication elective (approved list)	3		
Elective	2		
Junior Year	**F**		**S**
Elementary Physics, Phys 111-113	4		4
Humanities electives (approved list)	3		3
Junior Composition, Engl 300			3
Immunology, Micr 422	4		
Biochemistry, Chem 260	4		
Microbial Genetics, Micr 436	4		
Microbiology elective			3
Social Science elective (approved list)			3
Elective	2		

Senior Year	F	S
Seminar, Micr 440	1	1
Microbiology electives	4	4
*Quantitative Analysis, Chem 232 (or general elective)	4	
*Computer Programming , CSc 112 or CSc 114	3	
Elective (recommend 1-3 credits of Microbiology 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.

414 Anaerobic Microbiology 3(2,3)
Techniques used for the anaerobic cultivation of micro-organisms. 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.

436 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 and Micr 231.

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.

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.)

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 1989)

738 Microbial Metabolism 4(2,4) S (Offered in 1990)

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, Heemstra, Herbert, Hunzinger, Norris, and two non-commissioned officers.

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, 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 members of the Army National Guard and the Army Reserve. A second 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 Advanced Camp 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 textbooks, uniforms and other essential materials are furnished to the student at no cost.

Courses

101-102 Military Science I

101 The Army Officer 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 markmanship. OPTIONAL LABORATORIES include smallbore rifle marksmanship, adventure training such as rappelling, and life saving techniques.*

102 Military Geography and Leadership Tasks 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 a outdoor leadership and tactics exercise.*

201-202 Military Science II

201 Leadership Theory and Application 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 Officer Development and Tactics 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 similiar 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 Military Communication and Human Relations 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 Military Operations and Tactics 3(3**) FS
Application of skills learned in MS 301 with emphasis on leadership and management of personnel and resources in a 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.*

365 American Military History 3(3,0)
Taught by special arrangment through the History Department. Dr. Jerry Sweeney is the instructor.

401-402 Military Science IV

401 Soviet Studies & Military Law 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 Ethics and Professionalism 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 follwed 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.

To be eligible for commissioning, all students must have completed Engl 300 or Engl 303, Hist 365, and a course in the humanities.

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) Have an academic cumulative grade point average of 2.0 or higher.
(6) Complete a University offered Military History course prior to graduation.
(7) Have two years of academic work remaining for a degree.
(8) Sign a written agreement.

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 provided all previous requirements and a cumulative grade point average of 2.0 or higher is maintained.

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. 3-year and 2-year scholarship interviews are conducted during the fall semester in the Military Science Department on campus. 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 by the Department of the Army in the fall for University bound high school students. Applications are available in Room 200, DePuy Military Hall. 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 Department of Military Science, SDSU, Brookings, SD 57007 or call (605) 688-6151. Scholarship students must successfully complete a University offered foreign language course prior to graduation.

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) Northern Warfare training at Fort Greely, Alaska for 3 weeks
(5) Nursing Advanced Camp at selected Army hospitals for 4 weeks
(6) 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; Professor Emeritus P. Royer; Professors Colson, Johnson, Piersel, Walker; Associate Professors H. Berberian, Canaan, McKinney, Vensand; Assistant Professors Lis, Spencer; Instructors A. Berberian, R. Royer; Lecturer Coull

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 and the University 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)	49 hrs.
Music Curriculum:	
Basic Musicianship (Theory & Literature)	31 hrs.
Performance (Applied Music & Ensembles)	14 hrs.
Music Industry	3 hrs.
Senior Recital	0 hrs.
Professional Requirements/Electives	31 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.
Senior Recital	0 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 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		16-17
Sophomore Year	**F**		**S**
Natural Science (see approved list)	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
	16-17		17-18
Junior Year	**F**		**S**
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		16-17
Senior Year	**F**		**S**
Humanities* (Electives)	3		3
Social Science*	3		3
General Electives	4		4
Music Electives	2		2
Orchestration & Arranging, Mus 420	2-3	or	2-3
Recital, Mus 483	0-2		0-2
Applied Music 400	2		2
Music Organizations (if requirement not met)	1-2		1-2
	16-18		16-18

*Must be taken in at least two areas.

Suggested Curriculum in Arts and Science, Music Education Major B.M.E.
Leading to the Bachelor of Music Education 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 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		15-17

Sophomore Year	**F**		**S**
Natural Science (see approved list)	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
	16-19		17-19

Junior Year	**F**		**S**
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

Senior Year	**F**		**S**
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 483	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)

	Credit		
Freshman Year	**F**		**S**
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

Sophomore Year	**F**	**S**
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

Junior Year	**F**		**S**
Junior Comp, Eng 300			3
Social Science*	3	or	3
Humanities*	2	or	2
Physical Science	4	or	4
Accounting	3		
Publicity Methods, MCom 313			2
Counterpoint, Mus 311	2-3		
Forms & Analysis, Mus 313			3
Applied Music	2		2
Music Organization	1		1
General Electives	2		
	16-17		15-17

Senior Year	**F**	**S**
Business Finance, BAdm 310	3	
Physical Science		4
PASCAL Programming CSc 114		3
or		
FORTRAN CSc 213 (prerequisite CSc 112 Microcomputer Basic)		3
Marketing, Econ 353	3	
Orchestration & Arranging, Mus 420	2-3	
Music Literature V, Mus 433		2
Professional Electives	8	8
Senior Recital, Mus 483	0-2	0-2
	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. May be taken twice for credit if content is distinctly different.

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. Rythmic 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) 2-3(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 Rennaissance 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
An eclectric approach to K-8 music education curriculum, methods and materials.

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 is on choral literature, programming, and organization of the choral program in secondary schools.

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.

293 Course Specials Program 5
See description in Arts and Science section.

392-492 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.

483 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.

595-695 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
321-323	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 Violin			
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 page 15). 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 Blazey, Holter, Johnson; Professors Hofland, C. Peterson, E. Peterson; Associate Professors Anderson, Goddard, Hanson, Hegge, Howe, Moriarty, Ritter; Assistant Professors Ayotte, Brotsky, Chappell, Coyne, DeGroot, Doherty, T. Gaspar, Gehrke, Hanna, Iken, Jensen, Joffer, Kropenske, Larson, McBreen, Meyer-Gaspar, Pettigrew, Schroeder, Scott, Wagner; Instructors Adams, Carson, Crawford, Erpenbach, Kiefer, Lutter, Odland, Peters, Schurrer, 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 nursing 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; Prairie Lakes East and West, 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 does 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 Nurs 491 Directed Study, the students are required 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 the student was previously enrolled.
2. A statement regarding reasons for transferring.

These statements must be on file in the Department of Nursing prior to 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

	Credit		
Freshman Year	**F**		**S**
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 recommended)	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
	17		17

Sophomore Year	**F**		**S**
Mammalian Physiology, Zool 325	4		
Human Nutrition, NFS 321	3		
General Microbiology, Micr 231	4		
Human Dev. & Pers. III, CDFR 313	2	or	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	or	2
	16		18

Junior Year	**F**		**S**
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, 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 & Second Care, Nurs 363			3
NP: Childbearing Fam. in Prim & Sec Care, Clin Appn, Nurs 365			3
Elective/Humanities			2
Public Health Science, HSc 443			3
	18		18

Senior Year	**F**		**S**
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		
Elective/Humanities*	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
	17		15

Plan B

For the student who desires a slower pace.
For the student who needs to be gainfully employed.

First Year	**F**		**S**
General Chemistry, Chem 110	4		
Anatomy, Zool 221	3		
Fitness & Lifetime Act., PE 100*	1		1
Math Core* (recommended Algebra, Math 111)	3		
Freshman Composition, Engl 101*	3	or	3
Intro to Organic & Biochem, Chem 111			5
General Psychology, Psyc 101			3
Fundamentals of Speech, SpCm 101*	3	or	3
Elective/Humanities*	1		3
	15		15

Second Year	**F**		**S**
General Microbiology, Micr 231	4	or	4
Mammalian Physiology, Zool 325	4	or	4
Intro to Sociology, Soc 100	3		
Human Dev. & Person. I, CDFR 211	3		
Electives/Humanities*	4		6
Human Dev. & Person. III, CDFR 313	2	or	2
Human Nutrition, NFS 321	3	or	3
Abnormal Behavior, Psyc 451	3	or	3
	16		15

Third Year	**F**		**S**
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	or	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
	17	13

Fourth Year	**F**	**S**
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	
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
	16	14

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
	15

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, 313; NFS 303, 321; Pha 241; Zool 325; HSc 443; Micr 231, 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; completion of 3rd semester of nursing major or consent.

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.

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)

110 Orientation RN Upward Mobility Program 0
Registered Nurse orientation. P, RN, consent.

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.

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(3,0)
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.

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.

490 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.

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 1-4 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.

540-640 Legal & Ethical Accountability in Health Care 2(2,0)
Study of ethical positions and legal factors influencing behavior and decision making in health care. Emphasis on developing a justifiable ethical framework with consequent rights, responsibilities and conflicts. P, senior or graduate students in nursing and other health professionals with instructor's permission.

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.

570-670 Issues in Health Care Delivery 3
Study of the organization and the political, economic and social aspects of international, national and regional health care systems.

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. P, or conc 510-610

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

Associate Professor M. Crews, Head; Professor Beattie; Professors Emerti Colburn, Deethardt, Guild, Shank, Wills; Assistant Professors Bohannon, G. Crews, Krishnan; Instructor Propst

Majors in Nutrition, Food Science and Restaurant Management
Options available in the Nutrition and Food Science major are Dietetics, Nutrition, Food Science and Restaurant Management.

Minors in Nutrition and Food Science

A minor in Nutrition and Food Science requires 16 semester credits of NFS-prefixed courses which include NFS 321 and at least 5 credit hours of courses at the 300 level or higher. 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.

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. 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

Through the program in dietetics, students develop 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. or other ADA approved experience qualifies the student for eligibility to take the registration exam.

Freshman Year

Nutrition & the Family NFS 101 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
General Chemistry, Chem 110 or Chem 112 4
General Chemistry, Chem 114 4
Foods Principles, NFS 141 4
Freshman Comp, Engl 101 3
Fund of Speech, SpCm 101 3
Fitness and Lifetime Activities, PE 100 2
Algebra, Math 111 3

Sophomore Year

Intro to Soc., Soc 100 3
Mammalian Physiology, Zool 325 4
Food Service Purchasing, NFS 371 2
Macroeconomics Principles, Econ 201 3
Gen Microbiology, Micr 231 4
Anatomy, Zool 221 3
Elementary Organic Chemistry, Chem 120 4
Elementary Biochemistry, Chem 361 4
General Psychology, Psyc 101 3
Human Nutrition, NFS 321 3

Junior Year

Intro to Dietetics, NFS 322 5
Quantity Food Production & Service, NFS 381 3
Advanced Food Science, NFS 341 4
Business Management BAdm 360 3
Junior Comp, Engl 300 3
Equipment, Layout and Design, NFS 372 3
Educational Psychology, EPsyc 302 2
Principles of Accounting, Actg 210 3
Community Nutrition, NFS 424 3
Humanities/Electives 4

Senior Year

Institution Organization & Management, NFS 391 3
Advanced Human Nutrition, NFS 422 3
Clinical Nutrition, NFS 423 4
Seminar, NFS 403 2
Equip. Layout & Design, NFS 372 3
Food & Beverage Cost Control, NFS 382 3
Stat'l Methods, Stat 341 3
Computer-Assisted Food Systems Management, NFS 471 3
Electives 5

Suggested electives: (at least 2 credits of electives must be taken from the College of Home Economics)

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.

Well-equipped laboratories enable students to receive practical experience while learning the principles of food science.

Food Science (Science/Technical Curriculum)

Freshman Year

Nutrition & The Family, NFS 101 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 2
Gen Chemistry, Chem 112 4
Foods: Principles, NFS 141 4
Algebra, Math 111 or 113 3-5
Gen Psychology, Psyc 101 3

Sophomore Year

Gen Chemistry, Chem 114 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 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 Processing, NFS 351 3
Electives 5-7

Senior Year
Applied Chemical Instrumentation, Chem 330 3
Advanced Food Science, NFS 341 4
Animal Science Elective 3
Technical Control of Dairy Products II, DS 422 4
Research Problems, NFS 342 3
Advanced Human Nutrition, NFS 422 3
Humanities Electives 6
Electives 4-6

Suggested electives:
Elementary Physics I & II, Phys 111-113, Elementary Physical Chemistry, Chem 340; Computer Programming, CSc 311; Technical Communication, Engl 303; Mammalian Physiology, Zool 325; Anatomy, Zool 221; Macroeconomics Principles, Econ 201.

Food Science (Food Promotion/Advertising Curriculum)

Freshman Year
Nutrition & the Family, NFS 101 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
Fitness and Lifetime Activities, PE 100 2
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 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
Animal Science Elective 3
Dairy Foods, DS 231 3
Gen Psychology, Psyc 101 3
Electives 4

Junior Year
Biochemistry, Chem 361 4
Human Nutrition, NFS 321 3
Principles of Advertising, MCom 370 3
Junior Comp, Engl 300 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 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 8

Suggested electives:
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 the curriculum in Restaurant Management.

The program provides a firm foundation in food preparation and food service management supported by a strong background in business and economics. In addition, students have the opportunity to receive practicum credit for on-the-job work experience.

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.

Freshman Year
Intro to Hospitality Industry, NFS 171 2
Home Economics Core 10
Freshman Comp, Engl 101 3
Fund of Speech, SpCm 101 3
Fitness and Lifetime Activities, PE 100 2
Algebra, Math 111 3
Humanities Electives* 8

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Sophomore Year
Natural Science 8
Foods: Principles, NFS 141 4
Food Service Purchasing, NFS 371 2
Meat, Production to Consumption, AS 241 3
General Psychology, Psyc 101 3
Intro to Sociology, Soc 100 3
Microeconomics Principles, Econ 201 3
Prin of Accounting I, Actg 210 3
Electives** 4

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Junior Year
Equipment, Layout and Design, NFS 372 3
Food and Beverage Cost Control, NFS 382 3
Quantity Food Prod, NFS 381 3
Dairy Foods, DS 231 3
Hospitality Industry Law, NFS 361 or
Business Law, BAdm 350 2-3
Principles of Accounting, Actg. 211 3
Macroeconomic Principles, Econ 202 3
Marketing, Econ 353 3
Business Management, BAdm 360 3
Junior Comp, Engl 300 3
Electives** 2-3

33

Senior Year
Computer Assisted Food Service Management, NFS 471 3
Food Service Operational Mgt, NFS
481 (3 cr. &/or Professional Practicum, NFS 497 5
Money and Banking, Econ 330 3
Labor, Law & Econ, Econ 382 3
Electives** 14

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*Spanish 101 and 102 strongly recommended.
**Must include one course selected from Econ 301, 302, 433 and Stat 341 for Econ Minor.

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 5(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 (BAdm350) 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 361 or consent.

423 Clinical Nutrition 4(4,0) S
Role of nutritional intervention in pathological conditions. P, 422 or concurrent enrollment.

424 Community Nutrition 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.

497 Professional Practicum 1-12 FSSu
Supervised work or clinical experience in deitetics, 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.

660 Maternal and Infant Nutrition 3

662 Sociocultural Aspects of Nutrition 3(3,0)

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)

725 Nutrition and Human Performance 3(3,0)

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)

760 Child Nutrition 3(3,0)

761 Nutrition of the Aged 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 I, Pha 421		4
Biopharmaceutics and Pharmacokinetics, Pha 411		4
Mammalian Physiology, Zool 325		4

Fourth Year	F	S
Organic Medicinals II, Pha 422	4	
Pharmacology I-II, Pha 541-542	5	4
Junior Comp, Engl 300	3	
Prescription Practice, Pha 412		5
Drug Therapy I-II, 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 222, 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.

1. **Community Pharmacy**

	Credits
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, BAdm 350	3
Microcomputer BASIC and Literacy, CSc 112	2

2. **Institutional Pharmacy** (A residency following graduation is highly recommended.)

	Credits
Current Topics, Pha 401	1
Hospital Pharmacy, Pha 554	3
Adverse Drug Reactions, Pha 414	2
Advanced Pharmacokinetics, Pha 440	3
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
Microcomputer BASIC and Literacy, CSc 112	2
Business Law, BAdm 350	3
Accounting, Actg 210	3

3. **Clinical Pharmacy** (Pharm.D. degree is highly recommended.)

	Credits
Current Topics, Pha 401	1
Hospital Pharmacy, Pha 554	3
Advanced Pharmacokinetics, Pha 440	3
Adverse Drug Reactions, Pha 414	2
Microcomputer BASIC and Literacy, CSc 112	3
Statistical Methods, Stat 341	3
Pharmaceutical Research, Pha 455	1-3

4. **Graduate Study**

	Credits
General Chemistry, Chem 114	4
Fundamentals of Organic Chemistry, Chem 326-328	4,8
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 213	3
Pharmaceutical Research, Pha 455	3
Advanced Pharmacokinetics, Pha 440	3

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.

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, 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	

Third Year	F	S	Su
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 I, Pha 421		4	
Biopharmaceutics & Pharmacokinetics, Pha 411		4	
Mammalian Physiology, Zool 325		4	
*MBA Core Courses at SDSU			6-9

Fourth Year	F	S	Su
Organic Medicinals II, 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

Fifth Year	F	S
The Geriatric Patient, Pha 519	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

*MBA Core Courses Available at SDSU	Credits
Economics, Econ 201, 202	3,3
Principles of Accounting I-II, Actg 210, 211	3,3
Business Law I, BAdm 350	3
Pharmacy Management, Pha 552	3
Pharmaceutical Marketing, Pha 425	2
Business Finance, BAdm 310	3
Business Statistics, Stat 341	3

Sixth Year (USD Graduate School of Business)	F	S	Su
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 Chappell, Head; Professors Cascella, Hietbrink, Omodt; Associate Professor Dwivedi, Houglum; Assistant Professor Singh.

Undergraduate Courses

211 Pharmacy I 3(2,3) S
Theory, preparation, and application of pharmaceutical solution dosage forms. P, 2nd year standing in pharmacy, Chem 112, 120.

221 Chemical Properties & Analysis 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, 2nd year standing, Chem 112, 120.

222 Inorganic Medicinals 3(3,0) F
Inorganic compounds having pharmaceutical or medicinal value, stressing chemical properties, physical properties uses, incompatibilities and doses. P, 3rd year standing.

241 Pharmacology 3(3,0) FS
Basics of pharmacology and therapeutics for nurses and others. P, Chem 111, current enrollment in Zool 325.

312 Pharmacy II 4(3,3) F
Theory, preparation, and application of pharmaceutical solid, plastic, and polyphasic dosage forms. P, 3rd year standing.

323 Pharmaceutical Biochemistry 5(4,3) F
Chemistry of living organisms as basis for understanding metabolism and pharmacological action of medicinal preparations. P, 3rd year standing.

331 Pharmacognosy I 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.

332 Pharmacognosy II 4(3,3) S
Continuation of 331. P, Pha 331.

411 Biopharmaceutics and Pharmacokinetcs 4(4,0) 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 I 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 222, 323.

422 Organic Medicinals II 4(4,0) F
Continuation of 421. P, Pha 421, 4th year standing.

440 Advanced Pharmacokinetics 3(3,0) 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, pharmaceutics, 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 I 5(4,3) F
Basic principles of pharmacology and therapeutics. Laboratory illustration (student participation) of drug action. P, 4th year standing.

542 Pharmacology II 4(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

Professor Billow, Head; Professors Emeriti Eidsmoe, Gross; Associate Professor Powers; Assistant Professors Fischer, Halbert, Mort, Van Riper, Wallenberg; 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, 545.

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
Pharmaceutical Services in the hospital setting. P, 4th year standing or consent.

Philosophy and Religion (Phil-Rel)

College of Arts and Science

Professor Norlin, Head; Professors Kedl, Nelson; Assistant Professor Bahr

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.

313 Great Philosophers: (Topical) 2-3(2-3,0) FSSu
Explores the thinking of a selected philosopher. Seeks to understand the ideas behind the philosophers thinking and their implication for the modern world. (May be repeated for a total of 9 hours).

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, Confusianism, 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, Williams; Professors Emeriti Miller, Parker; Associate Professors Leisure, Quist; Assistant Professors Kitterman, Rauber, Schiller, Sippel; Instructors T. Hein, Lawler.

Two main objectives are considered in the organization of course work in the department. First, that the basic courses meet the needs of students in the various colleges of the university who need basic physics. Secondly, the selection 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/Professional Physics, administered in the College of Engineering, is built around a strong core of physics courses complemented by courses from engineering departments and consists of several tracks. The two Engineering Physics tracks are designed to give students the ability to apply new research developments to pressing problems of society. Students interested in industrial employment should consider one of these tracks. Students can chose either the mechanical engineering track or the electrical engineering track as their emphasis. The difference between these two tracks is that required and elective courses either emphasize the mechanical aspects or the electrical aspects of the physics-engineering relationship. Two major areas of employment are applied nuclear physics and condensed matter physics. A graduate with this background may enter employment immediately as an Engineer or continue graduate work in a field such as Nuclear Engineering, Electrical Engineering, Mechanical Engineering or Aerospace Engineering.

The Professional Physics track is a third track parallel to the two Engineering Physics tracks mentioned above. A student can switch from the Professional Physics track to either of the Engineering Physics tracks at any time prior to their fifth semester. Alternatively, a student could switch from one of the Engineering Physics tracks to the Professional Physics curriculum as late as their sixth semester. The required and elective courses in this curriculum lead to a strong physics major suitable for preparation for graduate school and eventually a position in research or university teaching.

The other curriculum leads to a B.S. degree with a physics major in the College of Arts and Science. This program is arranged so that with proper choice of electives a student may emphasize training for one of several careers. One elective area leaves 33 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. A second elective area includes all professional education courses that are required to enter secondary teaching.

To be eligible for graduation with a major in physics, a student must have a 2.0 average or above for all physics courses. An average of 2.0 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 Head of the Physics Department.

Curriculum in Engineering Physics/Professional Physics
128 Semester Credits Required for Graduation

I. Electrical Engineering Track		**Credit**
Freshman Year	**F**	**S**
Math 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	
Fitness & Lifetime Activities, PE 100	1	1
Orientation for Engineers, GE 110-111	1	1
General Physics I, Phys 211		4
Sophomore Year	**F**	**S**
Math Analysis III, Math 225	3	
General Physics II, Phys 213	4	
Introduction to Programming with FORTRAN, CSc 213	3	
Electric Circuits I-II, EE 215-216	3	3
Differential Equations, Math 321		3
Introduction to Modern Physics, Phys 331		3
Macroeconomic Principles, Econ 201		3
*Non-technical Electives	3	3
Junior Year	**F**	**S**
Classical Mechanics, Phys 351	3	
Thermodynamics & Statistical Mechanics, Phys 341	3	
Measurement Theory and Exper. Design, Phys 312	2	
Advanced Engineering Mathematics, Math 331 or Calculus of Several Variables, Math 327	3	
Electronics I-II, EE 320-321	3	3
Electronics Lab I-II, EE 322-323	1	1
Optics, Phys 361		3
Advanced Lab I, Phys 314		1

Junior Comp, Engl 300 or Technical Communications, Engl 303		3
**Technical electives		6

Senior Year	F	S
Quantum Mechanics I, Phys 471	3	
Introductory Nuclear Physics, Phys 433 or Physics of the Solid State, Phys 439	3	
Advanced Lab II, Phys 412	1	
Electromagnetism, Phys 421		3
Senior Design, Phys 464		3
*Non-technical Electives	3	4
**Technical Electives	6	6

*Non-technical electives are provided to strengthen cultural growth and education in the humanistic and social science areas. At least 13 additional credits must be selected from the approved list found in the front of the catalog under Graduation Requirements and should be logical and purposeful selections.

**Technical electives will be selected with the assistance of the student's advisor from courses offered by the Electrical Engineering, Physics, Computer Science, Chemistry, Biology, and Mathematics Departments. Electives must contain a minimum of 6 hours of design content. Complete lists of allowed electives is available in the Physics Department office. Any departures from these lists must be approved by the Head of the Physics Department.

II. Mechanical Engineering Track

Freshman Year	F	Credit S
Math Analysis I-II, Math 123-224	5	4
General Chemistry, Chem 112-114	4	3
Fr. Comp, Engl 101; Fund. of Speech, SpCm 101	3	3
Engineering Design Graphics I, EG 121	2	
Fitness and Lifetime Activities, PE 100	1	1
Orientation for Engineers, GE 110-111	1	1
General Physics I, Phys 211		4

Sophomore Year	F	S
Math Analysis III, Math 225	3	
General Physics II, Phys 213	4	
Intro. to Programming with FORTRAN, CSc 213	3	
Electric Circuits I-II, EE 215-216	3	3
Differential Equations, Math 321		3
Introduction to Modern Physics, Phys 331		3
Statics, EM 221	3	
Metal Processing, ES 225	1	
Fundamentals of Mechanical Design, ME 240		3
*Non-technical Electives		3

Junior Year	F	S
Classical Mechanics, Phys 351	3	
Thermodynamics and Stat. Mechanics, Phys 341	3	
Measurement Theory and Exper. Design, Phys 312	2	
Advanced Engineering Mathematics, Math 331 or Calculus of Several Variables, Math 327	3	
Macroeconomic Principles, Econ 201	3	
Optics, Phys 361		3
Advanced Lab I, Phys 314		1
Fluid Mechanics, EM 331		3
Junior Composition, Engl 300 or Technical Communications, Engl 303		3
*Non-Technical Electives	3	3
**Technical Electives		3

Senior Year	F	S
Quantum Mechanics I, Phys 471	3	
Introductory Nuclear Physics, Phys 433 or Physics of the Solid State, Phys 439	3	
Advanced Lab II, Phys 412	1	
Physics Colloquium, Phys 490		1
Electromagnetism, Phys 421		3
Senior Design, Phys 464		3
*Non-Technical Electives	4	
**Technical Electives	5	8

*Non-technical electives are provided to strengthen cultural growth and education in the humanistic and social science areas. At least 13 additional credits must be selected from the approved list found in the front of the catalog under Graduation Requirements and should be logical and purposeful selections.

**Technical electives will be selected with the assistance of the student's adviser from courses offered by the Mechanical Engineering, Physics, Computer Science, Chemistry, Biology, and Mathematics Departments. Electives must contain a minimum of 6 hours of design content. Complete lists of allowed electives is available in the Physics Department office. Any departures from these lists must be approved by the Head of the Physics Department.

III. Professional Physics Track

Freshman Year	F	Credit S
Math Analysis I-II, Math 123-224	5	4
General Chemistry, Chem 112-114	4	3
Fr Comp, Engl 101; Fund. of Speech, SpCm 101	3	3
Engineering Design Graphics I, EG 121	2	
Fitness and Lifetime Activities, PE 100	1	1
Orientation for Engineers, GE 110-111	1	1
General Physics I, Phys 211		4

Sophomore Year	F	S
Math Analysis III, Math 225	3	
General Physics II, Phys 213	4	
Intro. to Programming with FORTRAN, CSc 213	3	
Electric Circuits I-II, EE 215-216	3	3
Differential Equations, Math 321		3
Introduction to Modern Physics, Phys 331		3
*Non-Technical Electives	3	6

Junior Year	F	S
Classical Mechanics, Phys 351	3	
Thermodynamics and Stat. Mechanics, Phys 341	3	
Measurement Theory and Exper. Design, Phys 312	2	
Advanced Engineering Mathematics, Math 331 or Calculus of Several Variables, Math 327	3	
Macroeconomic Principles, Econ 201	3	
Optics, Phys 361		3
Advanced Lab I, Phys 314		1
Electromagnetism, Phys 421		3
Junior Composition, Engl 300 or Technical Communications, Engl 303		3
*Non-Technical Electives	3	
**Technical Electives		6

Senior Year	F	S
Quantum Mechanics I, Phys 471	3	
Introductory Nuclear Physics, Phys 433	3	
Physics of the Solid State, Phys 439		3
Advanced Lab II, Phys 412	1	
Physics Colloquium, Phys 490		1
Quantum Mechanics II, Phys 473		3
**Technical Electives	9	9

*Non-technical electives are provided to strengthen cultural growth and education in the humanistic and social science areas. At least 12 additional credits must be selected from the approved list found in the front of the catalog under Graduation Requirements and should be logical and purposeful selections.

**Technical electives will be selected with the assistance of the student's adviser from courses offered by the Physics, Computer Science, Chemistry, Biology, and Mathematics Departments. A complete lists of allowed electives is available in the Physics Department office. Any departure from this list must be approved by the Head of the Physics Department.

Curriculum in Arts and Science, Physics Major
Leading to the Bachelor of Science degree
128 Semester Credits Required

Freshman Year	F	S
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	

Sophomore Year	F	S
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 or Intro to Programming with FORTRAN, CSc 213	3		
Technology and Society, GE 231			2
Electives	5		7

Junior Year	**F**	**or**	**S**
Intro to Modern Physics, Phys 331	3		
Junior Composition, Engl 300	3		
Intro to Measurement Theory and Experiment Design, Phys 312	2		
Differential Equations, Math 321	3		
Electives	21		

Senior Year	**F**	**or**	**S**
Philosophy of Science, Phil 331 or Elementary Logic, Phil 235	3		
Physics Colloquium, Phys 490	1		
Electives	28		

Elective Areas of Study

I. General Physics

Phys 351, Phys 371, or Phys 421	3
Additional Physics electives	10
Additional Social Sciences electives from approved list	10
Additional Humanities electives from approved list	6
Additional electives	33

II. Science Teaching

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	7
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
Additional electives	3

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, Phys 111 and 113 or General Physics, Phys 211 and 213 together with Introduction to Modern Physics, Phys 331. The six remaining credit hours can be chosen from all remaining courses in the Physics Department except Phys 101.

Undergraduate Courses

101 Introductory Physics 4(3,2) FS
One-semester course. Concepts, vocabulary and methods of the science. P, Math 111, Math 112, Math 113, 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, Math 112, or Math 113. (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 2(1,3) F
Selected experiments from various branches of physics. Emphasis on precision and analysis of experimental error. P, junior standing in physics.

314 Advanced Laboratory I 1(0,3) S
Selected experiments, primarily in optics. P, concurrent registration in Phys 361 or consent.

331 Introduction to Modern 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) F
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, Phys 331 and Math 225.

351 Classical Mechanics 3(3,0) F
Newton's Laws, motion in one and three dimensions, central forces, harmonic oscillations, non-inertial reference frames, rotations of rigid bodies, and Lagrangian Mechanics. P, Phys 113 or Phys 213 and concurrent registration in Math 321.

361 Optics 3(3,0) S
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, Phys 213 or 113 with consent and Math 225.

412 Advanced Lab II 1(0,3) F
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 III 1(0,3) S
Continuation of 412 into individualized projects. Also, experiments in solid state physics, such as electron spin resonance and diamagnetism. P, Phys 412.

421 Electromagnetism 3(3,0) S
Principles of electricity and magnetism, with applications to dielectric and magnetic materials. Development of Maxwell's equations, and applications. P, Phys 213 and Math 321

433 Introductory Nuclear Physics 3(3,0) F
Radioactivity, nuclear spectra and structure, particle accelerators, fission and fusion, radiation safety, high energy particles. P, Phys 331.

439 Physics of the Solid State 3(3,0) F
Electronic processes with reference to electrical properties of metals, semiconductors and insulators. P, 331 and 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.

471 Quantum Mechanics I 3(3,0) S
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, Phys 331 or consent and Math 321.

473 Quantum Mechanics II 3(3,0) S
Atomic and molecular structure in terms of vector model and quantum mechanics. P, Phys 471.

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 1 semester during the senior year. P, senior standing.

493 Special Topics 1-3 FS
Special problems. Six total credits may be taken with maximum of 3 credits at one time. 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, Phys 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, Phys 433 or consent.

537-637 Science of Solids 3(3,0) S
Topics covered to satisfy student interests in areas such as magnetism, semi-conductors, superconductors, ferroelectrics, and devices based on these aspects of solids. The role of defects in solids and strength of materials may also be included. P, Phys 439 or consent.

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 Schwarzchild solution. P, Phys 421 or consent.

700 Seminar 0-1

743 Statistical Mechanics 3(3,0)

751 Theoretical Mechanics 3(3,0) F

761 Plasma Physics 3(3,0) S

771 Quantum Mechanics 3(3,0)

779 Group Theory in Quantum Mechanics 3(3,0)

790 Thesis 5-7

792 Research or Design Paper 2 FSSu

793 Special Topics 1-3 FS

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, Landscape and Parks, 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, Kohl, Malo, McDaniel, Moore, Reeves, Walgenbach, White; Professors Emeriti P. Carson, Fine, Gardner, Kinch, Semeniuk, Shank, Shubeck; Wells, Westin; Associate Professors Boe, M. Carson, Cholick, P. Evenson, Ferguson, Fixen, Lemme, Smolik, Wicks, Wrage; Assistant Professors Beck, Bonnemann, Carlson, Gallenberg, Geise, Gellner, Gerwing, Hall, Kephart, Pollmann, Rickerl, Schumacher, Stymiest, Twidwell; Instructors Gutormson, Sorensen.

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: (Biology) Chen; (Chemistry) D. Evenson; (Northern Grain Insect Research Laboratory-USDA/ARS) Branson, Dybing, Elliott, Fisher, Gustin, Kieckhefer, Lance, Riedell, Sutter; (North Central Soil Conservation Research Laboratory, Morris, MN-USDA/ARS) Benoit, Lindstrom, Olness; (University of South Dakota) Hoffman.

The primary goal of the department is to prepare you for leadership 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 leading to a career in research, teaching, or extension.

Graduates with training in plant science are sought by agribusiness, private foundations, and federal and state agencies for employment 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 areas of emphasis are offered in the major: (1) Business, (2) Plant Protection, (3) Production, and (4) Science.

The choice of an area of emphasis 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 advisers, to develop a program that can satisfy your needs.

The Department is equipped with modern classroom, laboratory, greenhouse, and field plot facilities. Numerous opportunities are available for part-time employment, scholarships, and work-study programs. The Agronomy and Conservation club offers opportunities 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 ranching; 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.

Freshman Year	F	S
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
Emphasis and Elective Courses**	6	6
	16	16

Sophomore Year	F	S
Soils, PS 113		3
Elementary Org Chem, Chem 120	4	
Principles of Economics I, Econ 201		3
Computer Science 112 or higher (excluding 203)..	2	
Humanities Electives*	3	3
Emphasis and Elective Courses**	8	7
	16	16

Junior Year	F	S
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	
Emphasis and Elective Courses**	10	6
	16	16

Senior Year	F	S
Undergraduate Seminar, PS 490	1	1
Plant Physiology, Bot 427	4	
Statistical Methods I, Stat 341	3	
Entomology Elective (PS 295, 305)		3
Social Science Elective*		3
Emphasis and Elective Couses**	8	9
	16	16

*See approved list, page 15
**See selected emphasis

Production Emphasis

Course	Credits
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 Comm., 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	22-25

Crops Courses	Crop Protection Courses	Soils Courses
Seed Tech, PS 303-2	Regulation and Appl Pesticides, PS 253-3	Soil Geography, PS 310-4
Grain Grading, PS 308-2	Horticultural Insects, PS 295-3	Soil Physics, PS 352-3
Grain & Seed Prod. & Process, PS 312-2	General Entmology, PS 295-3	Soil Conservation, PS 372-2
Forages, PS 313-3	Environ & Plt Health PS 322-2 (not to include Entmology elective)	Soil Chemistry, PS 412-2
World Crops PS 433-3	Diseases of Field Crops, PS 333-3	Soil Microbiology Micro 412-3
Plant Breeding, PS 443-3	Diseases of Hort. Crops, PS334-3	Irrigation, PS 483-3
	Weed Control, PS 343-3 (in soils option)	
	Mycology, PS 453-4	

Business Emphasis

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 Comm., Engl 303 or Pub Methods, MCom 313	3 or 2
Weed Control PS 343	3
Prin of Actg., Actg 210	3
Ag. Marketing, Econ 354	3
Business Administration, BAdm 360	3
Business Electives (see following list)	9
Plant Science Electives (at least one course from each of 3 areas on list***)	10
Unrestricted Electives	13-16

***See production option for list of approved courses in crops, crop production and soils areas.

Business Electives

Prin. of Accounting II	Actg 211-3
Cost Accounting	Actg 320-3
Farm & Ranch Management	AgEc 271-4
Rural Real Estate Appraisal	AgEc 373-3
Production Economics	AgEc 421-3
Grain & Livestock Marketing	AgEc 454-3
Ag Finance	AgEc 478-3
Ag Policy	AgEc 479-3
Livestock Evaluation & Marketing	AS 285-4
Personal Finance	BAdm 280-3
Business Finance	BAdm 310-3
Business Law I	BAdm 350-3
Business Law II	BAdm 351-3
Prin of Economics II	Econ 202-3
Money and Banking	Econ 330-3
Marketing Management	Econ 452-3

Science Emphasis

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
Introductory Physics, Physics 111 and 113	8
Technical Writing or Writing in Science, Engl 303 or 307	2 or 3
Science/Math Electives (courses numbered 200 or higher in Chem or 300 or higher in CSc, Bio, Bot, Micr, AE, and Zool)*	7
Area of Specialization (Crop Science or Soil Science or Entomology or Plant Pathology or Weed Science)**	17
Unrestricted Electives	6-8
	128

*Courses cannot be cross-listed as PS courses or used to meet Area of Emphasis requirements. **10 credits minimum prefixed PS with maximum of 3 credits from 492, 493, 494, 495, or 496 and 7 credits from 300 or higher non-Plant Science courses.

AGRONOMY MINOR: PS 103, 113, 223, 490, plus 6 additional credits of Plant Science courses.

ENTOMOLOGY MINOR: PS 253, 295, 305, Zool 357, plus 3 additional credits of Plant Science courses.

PLANT PATHOLOGY MINOR: PS 223, 333 or 334, 453, or Micro 310, plus 6 additional credits from the following courses: Bio 371, Bot 427, Micr 231, 412, PS 333, and 334.

SOILS MINOR: PS 113, 243, 323, 490, plus 6 additional credits from the following courses: PS 310, 352, 372, 412, or Micro 412.

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 Technology 2(1,2) F
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.

308 Grain Grading 2(1,2) S
Grain grading and field crop and weed identification. Grain market grading and quality determinations. Plant identification of field crops and weeds of major importance in the United States. P, 103 required, and 303 recommended.

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. (cross listed at Geog. 310)

312 Grain & Seed Production & Processing 2(2,0) AY S (Offered in 1990)
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 2 (0,3) F
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 1990)
Plant diseases caused by non-living environmental factors emphasizing variable climatic factors, soil moisture extremes, nutrient deficiences, 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 1989)
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 1989)
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 1(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 or Hort 101.

352 Physical Environment of Soils & Plants 3(2,2) AY S (Offered in 1990)
Physical properties and environment of the earth's surface as related to soil management, plant growth, ecology, and pollution abatement. P, 113 and Math 111.

372 Conservation & Management of Soils 2(2,0) AY F (Offered in 1990)
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, AgEc 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 1989)
Relationship of arthropods (insects, ticks, mites and relatives) to disease in man (public health) with emphasis on the northern Great Plains. Open to upperclassmen. (cross listed as Zool 393)

412 Soil Chemistry 2(2,0) AY S (Offered in 1989)
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) AY F (Offered in 1990)
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) F
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) F AY (Offered in 1990)
Structures, life histories, and classification of fungi. P, Micro 231. Cross-listed with Micro & Bot.

483 Irrigation — Crop & Soil Practices 3(3,0) S AY (Offered in 1990)
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 1-3 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.

*Students are encouraged to enroll in PS 494 or 495 or 496.

Graduate Courses

553-653 Advanced Genetics 3(3,0) AY F (Offered in 1990) Procedures in genetic studies as they relate to molecular and classical genetic applications. P, Bio 371.
700 Special Topics 1-6(1-3 per credit) FSSu
704 Virus & Bacterical Diseases of Plants 4(2,4) AY F (Offered in 1990)
711 Insect Ecology and Biological Control 3(2,2) AY S (Offered in 1989)
713 Host-Plant Pathogen Interactions 3(2,2) AY S (Offered in 1989)
721 Integrated Crop Pest Management 3(3,0) S
723 Insect Physiology 3(2,2) AY S (Offered in 1989)
732 Field Studies in Pedology 2 Su
733 Advanced Soil Genesis 3(2,3) AY S (Offered in 1990)
734 Plant Nematology 3(2,4) AY F (Offered in 1989)
741 Crop Breeding Techniques 1(1,0) AY Su (Offered in 1990)
743 Physical Properties of Soils 3(3,0) AY F (Offered in 1990)
744 Soils and Plant Nutrition 3(3,0) AY S (Offered in 1989)
751 Advances in Plant Pathology 1 AY F (Offered in 1989)
753 Genetics of Plant Disease Resistance 2(2,0) AY S (Offered in 1990)
754 Chemical Properties of Soils 4(4,0) AY F (Offered in 1989)
761 Taxonomy of Insects 3(3,0) AY F (Offered in 1990)
763 Environmental & Physiological Aspects of Crop Production 2(2,0) AY S (Offered in 1989)
771 Principles of Insecticide Use 3(3,0) AY F (Offered in 1989)
773 Cytogenetics 3(2,3) AY F (Offered in 1989)
776 Livestock Insect Pest Management 3 AY F (Offered in 1989)
780 Advanced Special Problems 1 or 2 FSSu
781 Graduate Seminar 1(1,0) FS
783 Crop-Water Relationships 2(2,0) AY F (Offered in 1989)
790 Thesis, MS. As arranged.
791 Thesis Sustaining, MS. As arranged.
890 Thesis, Ph.D. As arranged.
891 Thesis Sustaining, Ph.D. As arranged.

Political Science (PolS)

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: convey the values and traditions of our democratic governmental institutions and processes and encourage students to assert their talents in perserving and nurturing those values and traditions through participation in the body politic; engender critical thinking and a high proficiency in communication skills; serve the other social sciences as a cognate field; provide the student majoring in political science with foundation and advanced courses in the many subdisciplines of political science which, in turn, will contribute to the student's intellectual growth and occupational pursuits

Those who choose to major in political science ordinarily will be preparing for a career in law or public service as an elected governmental official, civil servant, military officer or teacher. Many majors pursue successful careers in business and industry including farming and ranching. Academic advisers will assist in planning 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 PolS 100 or 101 and at least 21 upper division credits (above 300). PolS 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. PolS 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 1-4

An intensive examination of significant political themes, issues, or problems. Topics will include, but are not limited to, the following: Republics and Self-Government; THe Constitution and Civil Liberties; Parties, Elections and Campaigns; Presidential-Congressional Relationships.

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; Instructor Gilliland

The Department offers preprofessional and applied curricula in the Psychology major and also offers a Psychological Services major. Each curiculum 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.; 409, History and Systems of Psychology, 3 cr.; 441, Social Psychology, 3 cr.; 451, Abnormal Behavior, 3 cr; Stat 341, Statistical Methods I, 3 cr. (recommended elective); 490, Psychology Seminar, 1 cr.; 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.); 490, 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.; 441, Social Psychology, 3 cr.; 451, Psychology of Abnormal Behavior, 3 cr.; 490, Psychology Seminar, 1 cr.; 492, Problems in Psychology, 3 cr.; 497, Practicum for Psychological Services, 12 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.

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 psychophysiologic disorders. P, 101 or 102.

490 Psychology Seminar 1(1,0) F
Current employment trends and developments within the profession. Required of all majors. P, senior standing or consent.

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 Psychological Services 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.

Graduate Courses

560-660 Topics in Psychology: (Topical) 2-4
An intensive examination of significant psychological issues, themes, or problems. May be repeated as topic changes for a total of 8 credits. P, 101 or 102.

792 Special Problems in Psychology 1-4 FSSu
P,101 or 102.

Religion (Rel)

(See Philosophy and Religion)

Reserve Officer Training Program

(See Aerospace Studies, Military Science)

Restaurant Management

(See Nutrition and Food Science)

Rural Sociology (Soc) (Anth)

College of Agriculture and Biological Sciences

Professor Satterlee, Head; Professors Faltemier, Hess, Kayongo-Male, Mendelsohn, Wagner; Professors Emeriti Dimit, Sauer; Associate Professors Baer, Stover, Grant, Instructor Awald.

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 opportunites. 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, 490: Seminar in Sociological Theory, and 17 additional electives. Sociology or Anthropology credits to include one of the following: Soc 150, 240, 250, 340, 490: Seminar in Sociological Measurements, 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.	
Total Hours	128

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)	
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, 490: Seminar in Sociological Theory, 490: Seminar in Sociological Measurements, and 17 additional electives	
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.	
Total Hours	128

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, Bio 151-153	6
Major in Sociology	**32**
(Same as BA in Arts and Science)	
General electives. Majors need to consult their adviser for recommended electives to best fit career aspirations	45
Total Hours	128

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.

410 North American Ethnology 3(3,0) (On Demand)
A comparative survey of native North American cultures representative of major cultural areas of North America. Emphasis on traditional cultures using a case-study approach.

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; P, consent of department program coordinator.

Graduate Courses

590-690 Special Problems 1-3 FSSu
P, open to undergraduate and graduate students with sufficient background and consent of instructor.

597-697 Topics in Anthropology 1-3(1-3,0) (On Demand)
Selected topics pertaining to theory and methods in cultural, physical anthropology and archaeology. P, undergraduate/graduate and consent of instructor.

793 Seminar 1-4 FSSu (On demand) P, graduate and consent of instructor.

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 3(3,0) 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.

233 Introduction to Leadership 1(1,0) (On demand)
Learn basic skills and theory necessary to be an effective leader. Areas such as time and conflict management, communication skills, motivation, self-analysis are stressed.

240 Sociology of Rural America 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 3(3,0) 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.

453 Industrial Sociology 3(3,0) S
An investigation of industrial societies with attention given to social trends creating industrialization, the development of organizations, the evolution of work-roles, international relations between industrial and non-industrial nations, and the future of industrial societies.

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 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.

492 Special Problems 1-3 FSSu
P, major or minor and junior or senior standing and prior consent of instructor.
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.

493 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.

495 Internship 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; P, consent of department program coordinator.

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 and consent of instructor.

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 and consent of instructor.

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 and consent of instructor.

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 and consent of instructor.

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 and consent of instructor.

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 and consent of instructor.

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 and consent of instructor.

710 Research Methods 3(3,0) S
711 Qualitative Research Methods 3(3,0) F
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) FSSu
781 Internship in Planning 1-6 FSSu
790 Thesis, M.S. as arranged 1-5
791 Thesis (Sustaining) 1(1,0) FSSu
792 Seminars 1-4 (On demand) FSSu
793 Research Paper in Sociology 1-3 (As arranged)
890 Dissertation, Ph.D. as arranged
891 Dissertation (Sustaining) (1,0) FSSu

Sociology (Soc)

(See Rural Sociology)

Soils

(See Plant Science)

Speech (Sp)

College of Arts and Science

Professor Zivanovic, Head; Professors Emeritus Hoogestraat, Stine; Professors Denton, Ferguson, Johnson, Meyer, Schliessmann, Widvey; Assistant Professors Hefling, Jorgensen, Lampson, Peterson, 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 — Radio, Television, and Film; 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

Opportunities are provided for participation in SDSU's nationally recognized intercollegiate Forensics program. Local, regional, and national participation is sponsored. Activities include debate, public speaking, and oral interpretation in contests, workshops, and public performances. Any regularly enrolled undergraduate student is eligible to participate. 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, language, and hearing services are available to students under the supervision of American Speech-Language-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 (RTVF 144-445, SpCm 281, Thea 135, 145, 195 and 490) 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 (RTVF 144-445, SpCm 281, Thea 135, 145, 195 and 490) 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
Total	**128**

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
Total	**128**

Option B — Theatre

Students seeking Option B, **Theatre**, should complete their **major** as follows: Thea 100, 131, 141, 351, five credits selected from Thea 135, 145, 490; 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 135, 145, 490; 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; RTVF 130; SpCm 101, 315, 322, 330, 334, 335; and sufficient electives to raise the combined total to 36 credits.

Option D — Radio, Television, and Film

Students seeking Option D, **Radio, Television, and Film** should complete their **major** as follows: RTVF 130, 260, 330, 331, 332, 333, 335, 336, 361, and four credits of RTVF 144-445, 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; RTVF 130; SpCm 101 or if advanced placed SpCm 222, 315, 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), Radio, Television, and Film (RTVF), 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 Communication Disorders 3(3,0) S (A.Y.)
Treatment and prevention of speech and language disorders. P, 131.

321 Audiology 4(4,0) S (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 Communication Disorders 3(3,0) S (A.Y.)
Diagnostic tools for Speech and Language Disorders. P, 131.

341 Clinical Practice in Speech Therapy 1-2 FSSu
May be repeated for total of 6 credits. P, consent.

441 Clinical Practice in Audiology 1-2 FSSu
May be repeated for a total of 4 credits. P, consent.

492 Special Problems in Speech Reeducation 1-2 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.

492 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.

Radio, Television, and Film (RTVF)

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.

144-445 Radio, Television, and Film 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, RTVF 130 and consent of instructor.
Section II: Television: P, RTVF 331 and consent of instructor.
Section III: Film: P, RTVF 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**

360 Film Narrative 3(2,3) S
Myths, values and beliefs as expressed in selected films; forms, styles, and directors.

361 Film Production 3(2,3) S (A.Y.)
Production methods as a tool of observation and personal expression, technique of animation, news — documentary, and commercial production.

372 Media and Market 3(2,3) S**

492 Special Problems 1-2 FSSu
Directed research. May be repeated for a total of 6 undergraduate credits. P, consent.

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.

564-664 Film Studies 3(3,0) (A.Y.)
Film art forms, artists and critics. Viewing and making films. Emphasis on major film theories.

762 Special Problems in Radio, TV, or Film 1-2 FSSu
Directed research. May be repeated to a total of 4 graduate credits. P, consent.

792 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 the intercollegiate Forensics program. Activities include debate, oral interpretation, and public speaking. Workshops and public performances may also be included. A minimum of 4 performances is required. May be repeated for a total of 8 credits. P, consent of the Director of Forensics.

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
The oral interpretation of literature in a non-competitive setting. Includes the study of prose, poetry, and drama for oral performance. Includes methods of analysis, interpretation, delivery techniques, and preparation leading to the public oral performance 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.

492 Special Problems 1-2 FSSu
Directed research. May be repeated for a total of 6 undergraduate credits. P, 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.

576-676 Directing Speech Activities 3(3,0) S (A.Y.)
Organizing and directing declamation, dramatic, and forensic programs.

707 Speech/English/Drama for Teachers 1-3

766 Rhetorical Theory 3(3,0) F (A.Y.)

790 Thesis (5-7) FSSu

791 Thesis Sustaining

792 Special Problems in Oral Interpretation 1-2 FSSu
Directed research. May be repeated to a total of 4 graduate credits. P, consent.

794 Special Problems in Public Address 1-2 FSSu
Directed research. May be repeated to a total of 4 graduate credits. P, consent.

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.

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 with Prairie Repertory Theatre Company. May be repeated to a total of 10 credits, but only 5 may be applied to a minor. P, consent.

492 Special Problems 1-2 FSSu
Directed research. May be repeated for a total of 6 undergraduate credits. 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 the classical to the present day.

792 Special Problems 1-2 FSSu
Directed research. May be repeated to a total of 4 graduate credits. P, consent.

Statistics (Stat)

Administrative Committee: Professors Edeburn, Hsia, Kim, Lacher, Monahan, Nielsen, Tucker; Associate Professors Ewing, Evenson, Vandever, Wicks; Instructor Ellingson. Teaching Faculty: Professors Hsia, Kim, Lacher, Monahan, Nielsen; Associate Professors Evenson, Vandever, Wicks; Instructor Ellingson; 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.

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, Math 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 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. P, 341 or 381.

551-651 Interpretation of Statistical Software Output 1
Interpretation of statistical software package(s). P, Stat 641.

761 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.

Technical Communications Minor Program

Dr. Bruce Brandt, English Department, Coordinator

The Technical Communications Minor unites courses from a number of departments into a program which provides in-depth training in the various kinds of communication, from letter writing to formal oral and written reports, which will be needed by anyone pursuing a career in a technical field. The Minor is designed to enrich the academic programs and increase the professional abilities of students in technical fields, and also to be beneficial to students with technical proficiencies who are in non-technical fields.

The Technical Communications Minor will require a minimum of 16 hours.

The following courses are required:

	Credits
CSc 300 Word and Text Processing	3
EG 121 Engineering Design Graphics I	2
Engl 303 Technical Communications	3
Engl 305 Advanced Technical Communications	3
SpCm 301 Oral Technical Communications	3

One additional elective is required, and students may choose from the following list:

	Credits
Engl 307 Writing in the Sciences	2
MCom 313 Publicity Methods	3
MCom 315 Magazine Writing and Editing	3
SpCm 315 Public Speaking	3
SpCm 322 Argumentation	3

Consult departmental listings for course information and prerequisites.

Textiles, Clothing and Interior Design (TC/ID)

College of Home Economics

Professor Evers, Head; Professors Emeriti Lund, Semeniuk, Stoflet; Associate Professors Sivers (Emeritus), Yost; Assistant Professor Lyons, Swedlund; Instructor Hallberg.

Majors in Textiles, Clothing and Interior Design
1) Textiles and Clothing major with an option in Retailing.
2) Interior Design major.

Some courses are offered alternate years while others are offered once a year. Work experience in retail sales and customer services is recommended before the Professional Practicum. To enroll in the Professional Practicum (TC/ID 497) a student must have 90 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	Credits
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. Students may enroll in a 1-2 semester "visiting scholar" program at FIT. The emphasis can be in Apparel Design, Retailing or several others. FIT courses transfer into the SDSU degree if approved prior to taking them. Upon graduation from SDSU the student receives the degree certificate from FIT. Planning should begin in sophomore year. See TCID department head for further information.

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, historical, sociological, and psychological factors.

Retailing Option
The Retailing curriculum is for students interested in careers in the marketing of textiles and apparel products by retail stores 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
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 as a Human Resource, 2 cr.
TC 235 Apparel Design & Manufacturing, 3 cr.
TC 242 Textiles, 3 cr.
ID 310 Interior Design Fabrics, 3 cr.
TC 315 Apparel Design, 3 cr.
TC 350 Dress & Adornment in World Cultures, 3 cr.
TC 372 History of Costume in Western Civilization, 3 cr.
TC 413 Socio-Psychological Aspects of Clothing, 3 cr.
TC/ID Electives, 14 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 or 140, 3 cr.
*G. Natural Science 8-13
Chem 110 or 112 (recommended)
*H. Social Science 9-14
Psyc 101, General Psychology 3 cr.
Soc 100, Introduction to Sociology, 3 cr.
Econ 200, Macroeconomics Principles, 3 cr. (recommended)
History or Anthropology elective, 3 cr.
*I. Humanities 6-11
ArtS 122 Design I, 3 cr.
J. Physical Education 2 cr.
PE 100 Fitness & Lifetime Activities, 2 cr.
K. Electives 14
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 as a Human Resource, 2 cr.
ID 221 Introduction to Interior Design, 3 cr.
TC 235 Apparel Design & Manufacturing, 3 cr.
TC 242 Textiles, 3 cr.
TC 311 Intro. to the Sewing Trade, 2 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 Retailing, 3 cr.
TC 413 Socio-Psychological Aspects of Clothing, 3 cr.
TC 473 Merchandise Planning & Control, 3 cr.
TC 487 Pre-practicum in Textiles and Clothing, 1 cr.
TC 497 Professional Practicum, 7 cr.
TC/ID electives, 7 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 6-11
ArtS 122 Design I, 3 cr.
*G. Mathematics 3
Math 111 or 140, 3 cr.
H. Natural Science 8-13
Chem 110 or Chem 112 (recommended)
I. Social Science (12 cr. required) 9-14
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 52
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 320 Lighting Design, 3 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 487 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 6-11
ArtS 122, Design I, 3 cr.
*G. Mathematics 3
Math 111 or 140, 3 cr.
*H. Natural Science 8-13
Chem 110 or 112 (recommended)
*I. Social Science (12 cr. required) 9-14
Econ 201, Macroeconomics Principles, 3 cr.
Psyc 101, General Psychology, 3 cr.

*For specific courses in the university liberal studies core see Graduation Requirements in this catalog.

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 3
Drafting 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 Design in the American Home** 2(2,0) S
Elements and principles of design as they relate to the selection of home furnishings. Materials and processes of manufacturing related to product quality.

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. Color theory and application.

***310 Interior Design Fabrics** 3(2,2) F88
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) S89
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) F89
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) F88, S90
Study of the professional practices of interior design firms. Preparation of specifications and installation documents. Review of installation procedures. P. ID 221.

320 Lighting Design 3(2,2) S89
Fundamentals of lighting. Preparation of lighting plans and specifications for a variety of interiors and related areas. P, 322.

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 competency.

331 Family Housing 3(3,0) F
An overview of housing in America including historical influence, space planning, energy conservation, and cross cultural aspects.

373 Retailing 3(3,0)
Principles of retailing 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) F89
Historical Backgrounds: from Antiquity through the Renaissance.

425 Historical Backgrounds of Homes & Furnishings II 3(3,0) S90
Historical Backgrounds: from Renaissance to present.

450 Shelter and Families 3(3,0) F, alternate years
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.

487 Pre-practicum in Interior Design and Housing 1(1,0) S
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
Supervised work experience in a cooperating retail design firm or design studio. Provides opportunities for interaction between business, community and the university. P, ID 373, ID 487, 90 sem. cr. 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)
Principles for selection and use of sewing equipment and construction techniques. Sloper production.

171 Clothing as a Human Resource 2(2,0)
Social, psychological and cultural factors affecting dress; aesthetic aspects of clothing and personal appearance, selection and coordination of wardrobe.

235 Apparel Design and Manufacturing 3(3,0)
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
An investigation of fiber, yarn, fabric construction, finishes and coloration methods in relation to specific end use and consumer satisfaction. Textile standards and legislation is reviewed. P, sophomore standing.

311 Introduction to the Sewing Trade 2(2,0)
Survey of apparel production methods. Comparison of construction techniques used in ready-to-wear production, custom-made garments, and home sewn apparel. Alterations and their management in retail settings.

312 Advanced Construction I 2(0,4) alternate years
Advanced problems in clothing construction. Topics of emphasis will vary among pattern-making, tailoring, and dressmaking techniques. P, 112 and 311.

315 Apparel Design 3(1,4)
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)
Social and economic factors that influence fashion demand. History and development of fashion industry. Activities involved in the production, distribution and marketing of fashion goods. P, Econ 201.

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)
Principles of retailing 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 Advanced Construction II 3(0,6) alternate years
Design for sewn-products industry. Management of custom sewing business. Advanced problems in small-scaled production settings. P, 312.

413 Socio-Psychological Aspects of Clothing 3(3,0)
Examination of clothing behavior from sociological, psychological and cultural perspectives.

***443 Advanced Textiles** 3(2,3)
Effects of fabric components on fabric properties and performance. Laboratory problems using research equipment and standard testing practices. P, 242 and Chemistry recommended.

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.

487 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
Planned and supervised work experience in a cooperating retail firm provides opportunity for integration of course work in the occupational setting. P, TC 373, 487, 90 sem. cr. and consent of the department. Minimum GPA 2.2. Recommended before the final semester.

Graduate Courses (TCID)

544-744 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.

592-792 Special Problems in Textiles, Clothing and Interior Design 1-4

743 Current Topics 1-3 cr.

770 Seminar in Textiles, Clothing & Interior Design 1-2

773 Costumes and Textiles Through the Ages 3(3,0) on demand

774 New Develoments in Textiles 3(3,0) on demand

* Require special fees, equipment, supplies or materials.
†Field trips required in these classes may require pro-rated charges to defray transportation costs.

Veterinary Science (Vet)

College of Agriculture and Biological Sciences

Professor Nelson, Head; Professors Francis, Johnson, Kirkbride, Swanson; Associate Professors Benefield, Libal, Vickers; Assistant Professors Janke, Thomson, Zeman; Instructors Leslie-Steen, Stotz; Adjunct Professor Evenson.

Complex systems of livestock farming, ranching, 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 undergraduate and graduate level teaching for auxiliary disciplines.

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 training, and many students complete a major for the 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 academic record and experience. The applicant should be aware of the difficulties involved in being accepted to a College of Veterinary Medicine. Keen competition should be anticipated.

South Dakota currently provides grants to residents enrolled in the professional curricula to pay the differential between resident and non-resident tuition of the school. These grants are administered by the State Board of Regents. The application forms can be obtained by writing to the S.D. Board of Regents, 700 Governors Drive, Pierre, S.D. 57501-2284, or call (605) 773-3455.

Suggested Pre-Veterinary Curriculum

		Credit	
Freshman Year	**F**		**S**
Intro Biology, Bio 151-153	3		3
General Chemistry, Chem 112-114	4		4
Algebra and Trigonometry, Math Analysis I, or Calculus, Math 113, 123, 222	5		
Freshman Composition, Engl 101	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Sophomore Year	**F**		**S**
Intro to Animal Science, AS 101	3		
Animal Nutrition, AS 223			3
Fund of Organic Chemistry, Chem 326-328	4		4
Elementary Physics, Phys 111-113	4		4
General Microbiology, Micr 231			4
Electives	5		2
Junior Year	**F**		**S**
Genetics, Bio 371	3(4)	or	3(4)
Elementary Biochemistry, Chem 361	5		
Intermediate Biochemistry, Chem 461			3
Junior Composition, Engl 300	3	or	3
Electives	6-9		7-11

Senior Year
Electives
Major requirements
Specific requirements for various veterinary colleges

* 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

323 Anatomy & Physiology of Livestock 4(3,3) S
General principles of anatomy and physiology are applied to all animals and avians, as well as humans. Important facets are discussed in relation to application to other disciplines. P, Biochem 361.

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

524-624 Virology 4(3,4) S
Basic course discussing the characterization, structure, and replication of viruses and the pathogenesis of viral disease in man and animals. Laboratory exercises emphasize techniques in virus isolation, characterization, and detection by immunological assays. P, Micr 422 or consent. Cross listed as Micr 524-624.

590-690 Problems in Veterinary Science 1-3 as arranged FS
Consent of Department Head.

723 Systemic Physiology 4(3,3) F (even years)

725 Systemic Physiology 4(3,3) S (odd years)

727 Endocrinology 4(3,3) F (odd years)

729 Principles and Techniques of Electron Microscopy 4(2,4) F

Visual Arts (Art)

College of Arts and Science

Professor Gambill, Head; Professor Edie (Emeritus), Morgan, Professor & Director of South Dakota Art Museum, J. Stuart; Associate Professors Berry (Emerita), Kruse, Spinar, S. Stuart; Assistant Professors Steele, Warrick.

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 and Arts and Science College Requirements.
II. Take Visual Art courses in Art Studio, 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), 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	Figure Drawing	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

ArtH 211	Survey of World Art and Architecture	3
ArtH 212	Western Traditions	3

(These should be taken during the sophomore and junior years.)
Art History Electives 6

C. **Visual Arts Curricula:** recommend beginning in sophomore year.

1. **Graphic Design:**

ArtD 251	Graphic Design I	3
ArtD 350	Graphic Design II	3
ArtD 351	Graphic Design III	3
ArtD 450	Graphic Design IV	3
ArtD 455	Photo-Graphics	3
MCom 160	Basic Photography	2
Prtg 111	Basic Presswork	3
Prtg 213	Reproduction Photography	4
Art Electives		12

The four Graphic Design courses (I-IV) must be taken in sequence. Recommend MCom 160 in sophomore year and Prtg 111 and 213 in sophomore and junior years. ArtH 100 is recommended during freshman year as one of the art history electives.

2. **Art Education:**

ArtS 253	Ceramics I	3
ArtS 241	Sculpture I	3
ArtE 415	Methods of Teaching Art in Public Schools	3

Education Division Requirements and related Education courses 28
Art Electives 6
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 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		12

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)

251 Graphic Design I 3(0,6)
Introduction to visual communications and graphic design theory. Discussion of design ethics and the relationship of the designer to society. No prerequisite required.

350 Graphic Design II 3(0,6)
The exploration of typographic form and theory. Emphasis on both historical and contemporary typographic study. P, ArtD 251 or consent of the instructor.

351 Graphic Design III 3(0,6)
The study of design systems, form, and typography as visual communications. Emphasis on problem solving. P, ArtD 350 or consent of the instructor.

450 Graphic Design IV 3(0,6)
Professional practices and portfolio for the graphic designer. P, ArtD 351, senior in graphic deisgn, or consent of the instructor.

455 Photo-Graphics 3(0,6)
Exploration of photographic processes as a means of graphic communication. P, ArtD 350 or 351, or consent of the instructor.

Art Education (ArtE)

415 Methods of Teaching Art in Public Schools 3(1,4)
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. No prerequisite.

211 Survey of World Art and Architecture 3(3,0) Alternating fall semesters.
Principal periods in the history of major world civilizations up to the 15th century A.D. No prerequisite.

212 Western Traditions in Art and Architecture 3(3,0) Alternating fall semesters.
Principal artistic styles in western culture: Renaissance to present. No prerequisite.

300 Modern Art and Architecture Survey 3(3,0)
Survey of Modern Art and Architecture from its beginnings in the 19th century. P, junior or senior standing. Recommend ArtH 100 or ArtH 212.

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, ArtH 212, or consent.

350 Oriental Art and Architecture 3(3,0)
Survey stressing the art historical monuments of India, China, and Japan. P, ArtH 211, or consent.

420 Seminar, Selected Topics in Art or Design 1(1,0)
Selected topics in Art History, Theory, or Criticism. Topics vary, may be repeated once. *P, junior or senior standing. Recommend ArtH 100 or ArtH 212.

490 Seminar in History or 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.

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)
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 prerequisite required.

211 Figure Drawing 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.

222 Color Theory 3(0,6)
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) F
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)
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) F
Continuation of Ceramics I. Emphasis on wheel throwing, glazing, stacking, and firing. *P, ArtS 253.

370 Weaving 3(0,6)
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)
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)
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 p. 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)
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 undertake.

493 Undergraduate Course Special Program 1-3(0,6)
See Undergraduate Course Special Program p. 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 p. 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 p. 35. P, permission of Department Head.

*Denotes course may be repeated once.

Wildlife and Fisheries Sciences (WL)

College of Agriculture and Biological Sciences

Professor Scalet, Head; Professors Bjugstad, Flake; Professor Emeritus Linder; Associate Professors Berry, Uresk; Assistant Professors Higgins, Jenkins, Keenlyne, Willis.

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. Other employment opportunities are available dependent on elective selection.

Students can also, with our curriculum, 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
Freshman Year	
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
Sophomore Year	
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 232, 361, or 380)	4
Humanities elective	3
Undergraduate Seminar, WL 490	½
Junior Year	
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	2,3 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 requierment are electives

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 and employment information, 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.

420 Wildlife Law and Enforcement 3(2,3) S (odd years)
Evolution of laws relating to fish and wildlife, enforcement of wildlife law, federal versus state jurisdiction, types of violations, native hunting and fishing rights, and other topics. Guest speakers from state, federal, and local law enforcement agencies. P, junior-senior standing.

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.

492 Research Problems 1-3 as arranged FSSu
Individualized instruction on specific research problems. P, consent of instructor.

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 and is associated with federal, state, or private operations.

Graduate Courses

511-611 Limnology 4(2,6) S (even years)
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 Advanced Fisheries Management 3(2,3) F (even years)
Principles and techniques of selected practices for reservoir, pond, and stream fisheries management. P, WL 367, 412, or consent.

515-615 Upland Game Management 3(2,3) S (odd years)
Upland game birds and mammals as components of ecosystems. Effects of farming; industry; social change; technology; and federal, state, and private programs on game and non-game species. Techniques for individual species management. P, WL 411 or consent.

517-617 Big Game Management 3(2,3) S (even years)
Big game life histories and distributions. Relationships of nutrition, reproduction, interspecific competition, and predation to management of big game habitat and harvest. Techniques for research and management of big game. P, WL411 or consent.

519-619 Waterfowl Management 3(2,3) F (odd years)
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, 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.

711 Aquatic Ecology 4(2,6) F (odd years)
713 Animal Population Dynamics 3(2,3) F (even years)
714 Fish Structure and Function 3(2,3) S (odd years)
715 Wildlife Research Design 3(2,3) S (odd years)
716 Aquaculture 3(2,3) S (even years)
790 Thesis in Wildlife 1-7 credits
791 Thesis Sustaining 1
792 Graduate Seminar 1(1,0)
793 Research Problems 1-3

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. 18 hours are required for the minor. In consultation with the Women's Studies Coordinator, students may substitute courses listed as electives for some of the required courses.

Women's Studies Minor

Required Courses

Course	Credit
History of Women in America, Hist 360	3
Sociology of Sex Roles, Soc 3283	3
Feminism and Theology, Rel 331	3
Dynamics of Family Development, CDFR 342	3
Women in American Culture, Hum 213	3
Seminar, Women & Politics, PolS 429	3

Elective Courses

Course	Credit
Seminar Women in the Labor Force, CHRD 592/692	3
Special Studies: Image of Women in Am. Lit, Engl 597/697	3
Course Special: Women in Foreign Language, MFL 394	3
Marriage, Soc 250	2
Work, Time and Energy, HEd 340	3
Women in the Visual Arts, ArtH 412	3
American Women: Roles & Relationships, CDFR 544/644	2
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

University Staff

(as of January 1988)

The number immediately after the title of a member of the staff indicates the year when the person was first employed as a regular member of the university staff, the number following if there is one, the year of appointment to present rank. An asterisk (*) in connection with a name indicates that there has been a break in the member's official connection with the University.

GENERAL ADMINISTRATION

Robert T. Wagner, President, Professor of Rural Sociology, Graduate Faculty, 1970, 1985; B.A., Augustana College, 1954; M.Div., Seabury Western Theological Seminary, 1957; M.Sac.Th., 1970; Ph.D., SDSU, 1972.

Carol J. Peterson, Vice President for Academic Affairs, Professor of Nursing, Graduate Faculty, 1977, 1987; Diploma in Nursing, Methodist Kaler School of Nursing, 1960; B.S., University of Minnesota, 1963; M.Ed., 1964; Ph.D., 1969.

Richard W. Powers, Vice President for Administration, 1986; B.A., Allegheny College, 1958; Ph.D., Indiana University, 1969.

Barbara M. Audley, Director of Lifelong Learning and Outreach, Director of the Summer Session, 1978; B.A., California State University, 1974; D.P.A., Nova University, 1982.

Glen L. Carver, Director of the Physical Plant, 1978.

Dean M. Hofland, Director of Admissions, 1963, 1983; B.S., SDSU, 1958; M.Ed., 1963; Ed.D., University of South Dakota, 1970.

Ranny B. Knutson, Registrar, 1968, 1985; B.A., Huron College, 1968; M.Ed., SDSU, 1973.

Leon A. Raney, Dean of Libraries, Professor of Library Science, Graduate Faculty, 1972, 1975; B.S., University of Central Arkansas, 1960; M.S., Louisiana State University, 1962; Ph.D., Indiana University, 1972.

Michael P. Reger, Dean of Student Affairs, 1979, 1984; B.A., Western Illinois University, 1970; M.S., 1972; Ph.D., Ohio State University, 1983.

Wesley G. Tschetter, Director of Finance, Budget and Personnel, 1982, 1987; B.S., SDSU, 1969; M.B.A., University of South Dakota, 1971.

ACADEMIC DEANS

Edna Page Anderson, Dean of the College of Home Economics, Professor of Home Economics Education, Graduate Faculty, 1978, 1986; B.S., Winthrop College, 1963; M.S., 1966; Ph.D., Pennsylvania State University, 1976.

David A. Bryant, Dean of the College of Agriculture and Biological Sciences, Professor of Animal & Range Sciences, 1987; A.A., Lower Columbia College, 1963; M.S., Texas Technical University, 1967; Ph.D., University of Arizona, 1971.

Ernest L. Buckley, P.E., Dean of the College of Engineering, Professor of Civil Engineering, 1983; B.S., SDSU, 1948; M.S., Kansas State University, 1949; Ph.D., University of Texas, 1972.

Margaret Hegge, Acting Dean of the College of Nursing, Associate Professor of Nursing, Coordinator of Advanced and Continuing Nursing Education, 1969, 1987; B.A., Gustavus Adolphus College, 1969; M.Ed., SDSU, 1972; Ed.D., University of South Dakota, 1983; M.S., University of Minnesota, 1984.

Bernard E. Hietbrink, Dean of College of Pharmacy, Professor of Pharmaceutical Sciences, Graduate Faculty, 1964, 1987; B.S., SDSU, 1958; Ph.D., University of Chicago, 1961.

Darrell Jensen, Dean of the Division of Education, Professor of Education, Graduate Faculty, 1971, 1977; B.S., Northwest Missouri State College, 1959; M.A., Drake University, 1965; Ph.D., University of Iowa, 1971.

Rex C. Myers, Dean of the College of Arts and Science, 1986; B.A., University of Montana, 1967; M.A., 1970; Ph.D., Western State College, 1972.

James O. Pedersen, Dean of General Registration, Professor of Education, 1957, 1983; B.S., SDSU, 1955; M.S., 1962; Ph.D., Purdue University, 1968.

Christopher P. Sword, Dean of the Graduate School, Director of Research, Professor of Microbiology, Graduate Faculty, 1976, 1977; B.S., Loyola University, Los Angeles, 1951; Ph.D., University of California, 1959.

FACULTY, STAFF

Following the Dean of the Graduate School, the faculty are listed alphabetically.

Mary E. Aamot, 4-H Youth Specialist, Assistant Professor of Extension, 1967, 1981; B.A., Mt. Marty College, 1965; M.A., SDSU, 1976.

Wallace G. Aanderud, Professor Emeritus of Economics, Graduate Faculty, 1963, 1985; B.S., North Dakota State University, 1950; M.S., 1960; Ph.D., Oklahoma State University, 1963.

***Abdul A. Abdul-Shafi,** Associate Professor of Civil Engineering, Graduate Faculty, 1958, 1974; B.S., Utah State University, 1953; M.S., University of Missouri, 1955.

Oscar R. Abel, Associate Professor Emeritus of Journalism, 1942, 1973; B.S., SDSU, 1942.

Dwight L. Adams, Professor Emeritus of Military Science, 1962, 1973; B.B.A., University of Georgia, 1959.

Priscilla L. Adams, Instructor in Nursing, 1983; B.S.N., University of Nebraska Medical Center, 1977; M.S.N., 1983.

Ralph Alcock, Assistant Professor of Agricultural Engineering, 1981; B.S., Chelsea College, 1966; M.D.Ag.E., West Scotland Agricultural College, 1967; G. Dip. Ed., West Australian Institute of Technology, 1978; M.S., Rutgers University, 1980.

***Ruth A. Alexander,** Professor and Head of English, Coordinator of General Studies in Humanities, Graduate Faculty, 1952, 1981; B.A., Michigan State University, 1945; M.A., University of Minnesota, 1947; Ph.D., Michigan State University, 1952.

Herbert R. Allen, Professor Emeritus of Economics, Graduate Faculty, 1963, 1987; B.S., Iowa State University, 1950; M.S., 1952; Ph.D., SDSU, 1968.

Debra A. Allyn, Instructor of HPER, 1983; B.S., St. Cloud State University, 1977; M.S., 1982.

Mark Amundsom, Adjunct Professor of Sports Medicine, 1987; B.S., SDSU, 1982; R.P.T., School of Physical Therapy, Mayo Clinic, 1982; M.S., SDSU, 1987.

Gary A. Anderson, Assistant Professor of Agricultural Engineering, 1987; B.S., SDSU, 1975; M.S., Iowa State University, 1985; Ph.D., 1987.

Joanne B. Anderson, Associate Professor of Nursing, 1981; B.S.N., SDSU, 1964; M.S.N., University of Washington, 1974.

R. D. Anderson, Professor Emeritus of General Engineering, 1946, 1973; B.S., SDSU, 1933; M.A., University of Wyoming, 1953.

Alfred S. Andrawis, Instructor in Electrical Engineering, 1981; B.S., Alexandria University, 1974; M.S., SDSU, 1982.

Madeleine Y. Andrawis, Instructor in Electrical Engineering, 1980, 1983; B.S., Cairo University, 1977; M.S., SDSU, 1983.

***Michelle I. Ansorge,** Head Clinical Medicine/Adjunct Assistant Professor of Nursing, 1986, 1987; B.M., University of Iowa, 1977; M.D., 1981.

W. Eugene Arnold, Acting Associate Dean of the College of Agriculture and Biological Sciences, Professor of Plant Science, Graduate Faculty, 1970, 1985; B.S., Oklahoma State University, 1965; Ph.D., North Dakota State University, 1970.

Kay Assam, Instructor in Nursing, 1981; B.A., Augustana College 1978; M.A., University of South Dakota, 1980.

Valerie S. Averill, Area Coordinator, Student Housing, 1986; B.A., Eastern Illinois University, 1981; M.S., 1983.

John C. Awald, Adjunct Instructor of Rural Sociology, 1977; B.A., University of Arizona, 1972; M.A., University of Wisconsin, 1974.

***Clara J. Ayers,** Associate Professor of Mathematics, 1964, 1977; B.S., Minot State College, 1958; M.A., University of Minnesota, 1962.

Sydney Ayotte, Assistant Professor of Nursing, Coordinator of West River RN Upward Mobility Program, 1980, 1983; A.A., Oakland City College, 1963; B.S.N., California State University, 1973; M.S., 1975.

Linda L. Baer, Associate Professor of Rural Sociology, Graduate Faculty, Rural Sociology, 1976, 1987; B.A., Washington State University, 1971; M.A., Colorado State University, 1975; Ph.D., SDSU, 1983.

Norman W. Baer, Instructor of Horticulture, 1975, 1981; B.S., Washington State University, 1969; Ph.D., Colorado State University, 1975.

Rebecca K. Baer, Research Assistant in Chemistry, 1984; B.S., University of Georgia, 1982.

Robert J. Baer, Associate Professor of Dairy Science, 1982, 1987; A.A.S., State University of New York, 1975; B.S., University of Georgia, 1977; M.S., 1979; Ph.D., 1983.

Harold S. Bailey, Vice President for Academic Affairs Emeritus, Distinguished Professor of Higher Education, Graduate Faculty, 1951, 1985; B.S., Massachussetts College of Pharmacy, 1944; M.S., 1948, Ph.D., Purdue University, 1951.

James Bailey, Professor Emeritus of Veterinary Science, 1968, 1986; D.V.M., Iowa State University, 1946.

Philip R. Baker, Professor of Foreign Language, 1973, 1985; B.A., University of Connecticut, 1959; M.A., Middlebury College, 1965; M.A.T., University of Hartford, 1968; Ph.D., Florida State University, 1973.

Roscoe Baker, Professor Emeritus of Microbiology and Dairy Science, Graduate Faculty, 1950, 1982; B.S., Iowa State University, 1942; M.S., 1947; Ph.D., 1950.

Thomas B. Bare, Jr., Information Specialist, Public TV Production, Assistant Professor of Educational Television, 1980, 1982; B.A., West Virginia University, 1964; M.A., Michigan State University, 1966.

Cynthia Barnard, Instructor in Nursing, 1986; B.S., Mount Marty, 1971; M.S.N., University of Nebraska Medical Center, 1984.

Allen R. Barnes, Dean Emeritus of Arts & Science, Regental Professor Emeritus of Foreign Languages, Graduate Faculty, 1961, 1987; B.A., Hastings College, 1948; M.A., University of Idaho, 1951; Ph.D., University of Madrid, Spain, 1953.

Marilyn J. Barnett, Adjunct Instructor of Chemistry, 1982; B.A., College of St. Catherine, 1953; M.S., Wayne State University, 1955.

Emery Bartle, Associate Professor Emeritus of Dairy Science, 1944, 1971; B.S., SDSU, 1926; M.S., 1950.

***Kurt D. Bassett,** Instructor in Mechanical Engineering, 1982, 1983; B.S., SDSU, 1981; M.S., 1983.

Etta W. Bassinger, Adjunct Instructor of Chemistry, 1984; B.S., Northern State College, 1968.

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