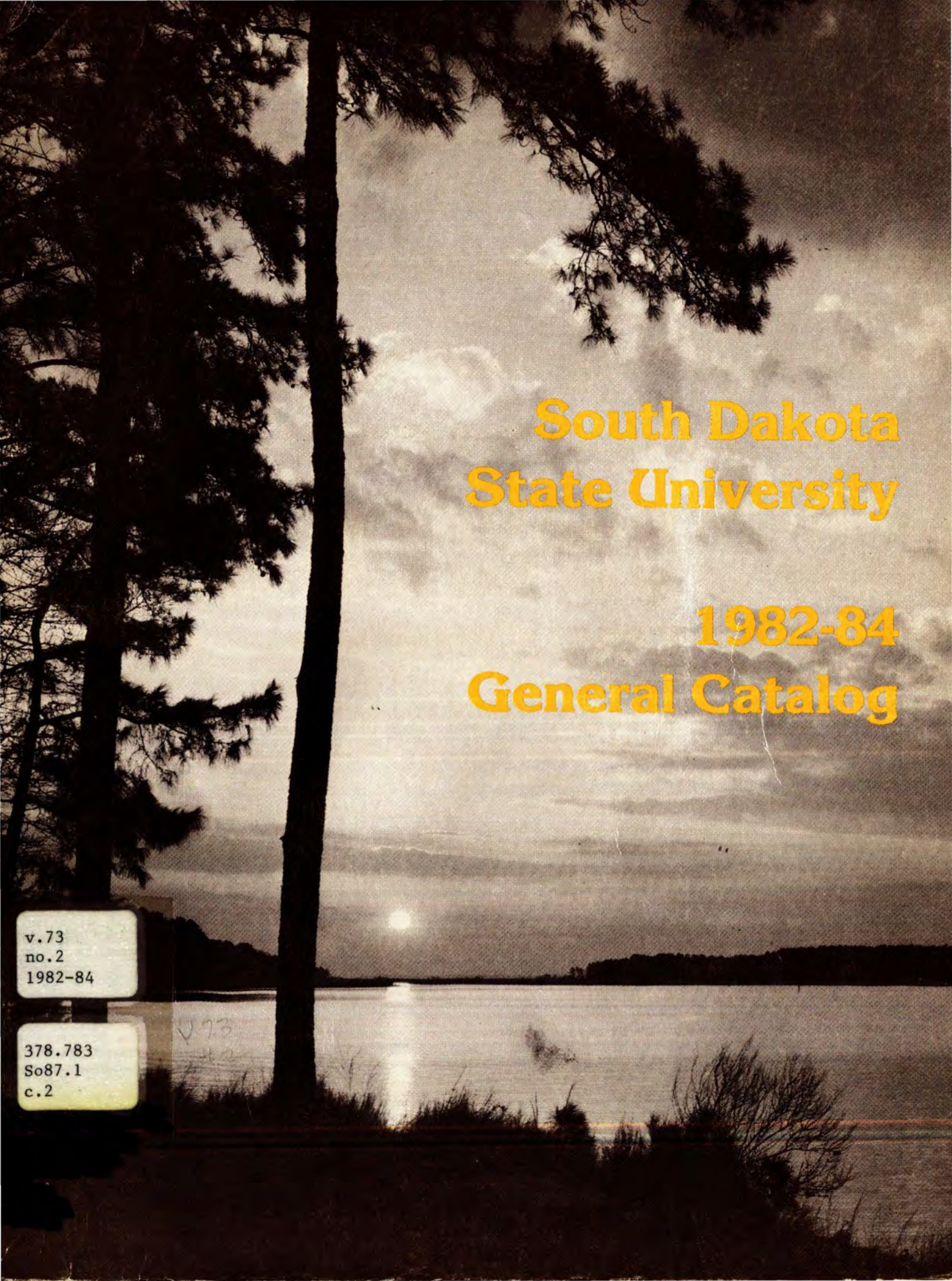

South Dakota State University

1982-84 General Catalog

General Catalog 1982-84

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South Dakota State University Bulletin (USPS 474-180)

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Due to conditions which may arise beyond the control of South Dakota State University, statements in this catalog may be changed during the 1982-83 and 1983-84 school years without notice. In so far as possible, courses listed and approved by the Regents of Education will be offered, but the university reserves the right to modify any statement in accordance with finances and other unforseen conditions.

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

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

1982-1983 University Calendar

1982 Fall Semester

(2 days registration, 73 class days, 5 exam days)

August 23, 24, Monday & Tuesday ..... Registration
August 25, Wednesday ..... Instruction begins
September 6, Monday ..... Labor Day
September 8, Wednesday ..... Monday classes
September 8, Wednesday ..... Last day to add or drop a course and adjust final fees
October 2, Saturday ..... Hobo Day
October 4, Monday ..... Last day to submit graduation card for fall 1982 graduates
October 11, Monday ..... Pioneer Day — A holiday
October 25, Monday ..... Deficiency reports due by 5:00 pm in Registrar's office
November 8, Monday ..... Last day a course may be dropped
November 11, Thursday ..... Veteran's Day — A holiday
November 24, Wednesday ..... Classes close 5:20 pm Thanksgiving recess
November 29, Monday ..... Instruction resumes
December 11, Saturday ..... Graduation, 10:00 am
December 13-17, Monday-Friday ..... Semester exams
December 22, Wednesday ..... Grades due in Registrar's office by 5:00 pm

1983 Spring Semester

(2 days registration, 75 class days, 5 exam days)

January 10-11, Monday & Tuesday ..... Registration
January 12, Wednesday ..... Instruction begins
January 25, Tuesday ..... Last day to add or drop a course and adjust final fees
February 14, Monday ..... President's Day — A holiday
February 17, Thursday ..... Monday classes
February 25, Friday ..... Last day to submit a graduation card for spring 1983 graduates
March 4, Friday ..... Classes close 10:00 pm — Spring Break
March 7, Monday ..... Deficiency reports due by 5:00 pm in Registrar's office
March 14, Monday ..... Instruction resumes
March 28, Tuesday ..... Last day a course may be dropped
March 31, Thursday ..... Classes close at 5:20 pm — Easter recess
April 5, Tuesday ..... Instruction resumes
April 20, Wednesday ..... Monday classes
May 7, Saturday ..... 97th Annual Commencement, 10:00 am
May 9-13, Monday-Friday ..... Semester exams
May 18, Wednesday ..... Grades due in Registrar's office by 5:00 pm

1983 University Summer Session

June 6, Monday — **July 29,** Friday ..... Eight-week session
June 6, Monday ..... Registration
June 7, Tuesday ..... Instruction begins
July 1, Friday ..... Graduation cards due
July 4, Monday ..... Holiday
July 29, Friday ..... Instruction ends

1983-1984 University Calendar

1983 Fall Semester

(2 days registration, 73 class days, 5 exam days)

August 24-25, Wednesday & Thursday ..... Registration
August 26, Friday ..... Instruction begins
September 5, Monday ..... Labor Day — A holiday
September 9, Friday ..... Last day to add or drop a course and adjust final fees
October 5, Wednesday ..... Last day to submit graduation card for fall 1983 graduates
October 10, Monday ..... Pioneer Day — A holiday
October 11, Tuesday ..... Monday classes
October 15, Saturday ..... Hobo Day
October 26, Wednesday ..... Deficiency reports due by 5:00 p.m. in Registrar's office
November 9, Wednesday ..... Last day a course may be dropped
November 11, Friday ..... Veteran's Day — A holiday
November 23, Wednesday ..... Classes close 5:20 p.m. Thanksgiving recess
November 28, Monday ..... Instruction resumes
December 10, Saturday ..... Graduation, 10:00 a.m.
December 14, Wednesday ..... No classes
December 15, 16, 19, 20, 21, Thursday, Friday, Monday, Tuesday, and Wednesday ..... Semester exams
December 23, Friday ..... Grades due in Registrar's office by 5:00 p.m.

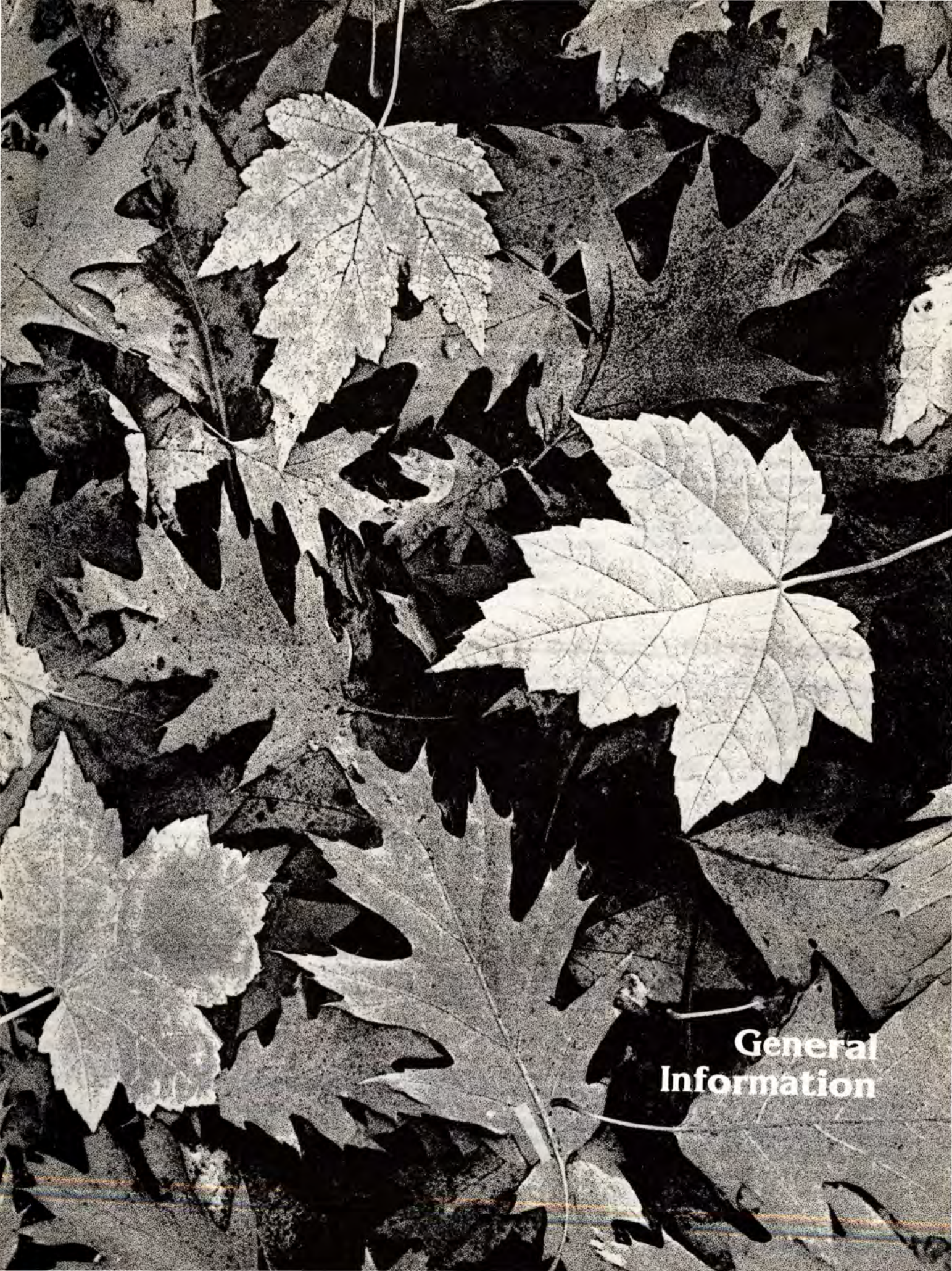
1984 Spring Semester

(2 days registration, 75 class days, 5 exam days)

January 9-10, Monday & Tuesday ..... Registration
January 11, Wednesday ..... Instruction begins
January 24, Tuesday ..... Last day to add or drop a course and adjust final fees
February 13, Monday ..... President's Day — A holiday
February 15, Wednesday ..... Monday classes
February 24, Friday ..... Last day to submit a graduation card for spring 1984 graduates
March 2, Friday ..... Classes close 10:00 p.m. — Spring break
March 5, Monday ..... Deficiency reports due by 5:00 p.m. in Registrar's office
March 12, Monday ..... Instruction resumes
March 27, Tuesday ..... Last day a course may be dropped
April 19, Thursday ..... Classes close at 5:20 p.m. Easter recess
April 24, Tuesday ..... Instruction resumes
April 26, Thursday ..... Monday classes
May 5, Saturday ..... 98th Annual Commencement, 10:00 a.m.
May 7-11, Monday-Friday ..... Semester exams
May 16, Wednesday ..... Grades due in Registrar's office by 5:00 p.m.

1984 University Summer Session

June 4, Monday — **July 27,** Friday ..... Eight-week session
June 4, Monday ..... Registration
June 5, Tuesday ..... Instruction begin
June 29, Friday ..... Graduation cards du
July 4, Wednesday ..... Holida
July 30, Friday ..... Instruction en



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, secretarial science, and other areas.
5. To promote and conduct research in agriculture; engineering; home economics; pharmacy; nursing; teacher education; basic physical, biological, and social sciences, and humanities.
6. To promote and conduct extension educational programs for youth and adults in South Dakota.
7. To provide other services for the welfare of the state.

Historical Sketch

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

The Legislature of 1883 provided for the first building.

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

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

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

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

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

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

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

Organization

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

The Faculty. Consists of the President, the Vice-Presidents, the Deans and other administrative officers, teachers and researchers with rank of instructor or above. The faculty is responsible in general for academic standards and procedures, including recommendation to the Regents of candidates for degrees.

Faculty business is conducted by the Academic Senate, an elected body through which faculty express concerns for the 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 Betty Redfield (Term expires March 31, 1983) ..... Hot Springs
Honorable Bonnie Sivage (Term expires March 31, 1983) ..... Hayes
Honorable Fredric Cozad (Term expires March 31, 1985) ..... Martin
Honorable William J. Srstka, Jr. (Term expires March 31, 1985) ..... Pierre
Honorable Michelle Tapken (Term expires March 31, 1985) ..... Yankton
Honorable Howard C. Levi (Term expires October 8, 1985) ..... Mina Lake
Honorable Dennis McFarland (Term expires March 31, 1987) ..... Sioux Falls
Honorable Marge Mortimer (Term expires March 31, 1987) ..... Belle Fourche
Honorable Howard Owens (Term expires March 31, 1987) ..... Sturgis
Jeffrey Hiemstra, Student Regent
Honorable Gordon Foster, Executive Director ..... Pierre

General Administration

Sherwood O. Berg, Ph.D., President
Harold S. Bailey, Jr., Ph.D., Vice President for Academic Affairs
Gary A. Thibodeau, Ph.D., Vice President for Administration
Barbara Audley, B.A., Director, Continuing Adult Education
Wesley A. Bugg, B.S., Director of Finance
Charles F. Cecil, M.A., Assistant to the President
Glen Carver, Director of Physical Plant
Vincent O. Heer, M.S., Director of Admissions, and High School Relations
Harvey E. Johnson, M.Ed., Registrar
James O. Pedersen, Ph.D., Dean of Student Services
Leon Raney, Ph.D., Dean of Libraries
Robert T. Wagner, Ph.D., Assistant to the Vice President for Academic Affairs, and Chairman, Council on Continuing Education

Academic Deans

Allen R. Barnes, Ph.D., Dean, College of Arts and Science
Delwyn Dearborn, Ph.D., Dean, College of Agriculture and Biological Sciences
Ardyce Gilbert, Ph.D., Dean, College of Home Economics
Raymond Hopponen, Ph.D., Dean, College of Pharmacy
Darrell Jensen, Ph.D., Dean, Division of Education
Arnold Menning, Ph.D., Dean, College of General Registration
Carol J. Peterson, Ph.D., Dean, College of Nursing
Junis O. Storry, Ph.D., Dean, College of Engineering
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 relationship to this code.

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

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

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

1. Respects the brotherhood of many by following the principle of doing to others as he or she would have them do to him or her.
2. Supports the dignity of fellow human beings in his or her own and alien cultures by respecting their social amenities, rights, abilities, and racial, religious and cultural attributes.

Objectives of the Research Program

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

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

Research Institutes

The University Research and Instructional Program is also carried on through four institutional programs: Institute of Irrigation Technology, Institue of Social Sciences for Rural-Urban Research and Planning, Remote Sensing Institute, and Water Resources Institute. For further information, consult the director of the institute involved.

The Agricultural Experiment Station

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

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

This new knowledge is effectively used in the campus classroom and in extension education programs throughout the State. Courses in the College of Agriculture and Biological Sciences and in the College of Home Economics are especially strengthened by this new knowledge. State and area extension specialists in Agriculture and Home Economics, plus counties have immediate access to this information for their educational efforts.

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

Research may be grouped in the following subject matter areas; crops and soils, community and public affairs, animal health, fertilizers, garden and orchard, home and consumer, water resources and irrigation, forestry, livestock, 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

Hollis D. Hall, associate dean, College of Agriculture and Biological Sciences; director, Cooperative Extension Service

This is the off-campus teaching 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 county extension agents, county home economists 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 60 years by SDSU in cooperation with the U.S. Department of Agriculture and county governments.

Thirty-eight percent of the funds supporting Cooperative Extension educational programs are appropriations to SDSU by the Legislature, 46 percent come from Federal appropriations and 15 percent from counties.

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

1. To provide non-formal education on improving the natural resource management on producing and marketing food, and fiber and on maintaining environmental quality.
2. To provide non-formal education on improving the quality of family living and human nutrition.
3. To provide non-formal education opportunities for youth through 4-H and other youth activities.
4. To provide non-formal education on developing communities for better living.

The professional 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 Agriculture and Home Economics, Natural Resources, and the Social Sciences.

University Affiliations and Accreditations

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

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

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

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

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

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

The Chemistry department is accredited by the American Chemical Society.

The University Counseling Center is fully accredited by the International Association of Counseling Services.

The coordinated undergraduate program in dietetics has been awarded developmental accreditation status by the American Dietetics 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 Accredition of Teacher Education.

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

The University also holds membership in the American Council on Education, the National Education Association, the American Association of University Women, the American Association of Colleges of Pharmacy, the American Society for Engineering Education, the Association of Accredited Schools and Departments of Journalism, the American Library Association, 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.

Academic 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. Those seeking readmission or those who have been enrolled at other institutions under the control of the S.D. Board of Regents do not pay the $15 application fee.

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

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

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

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

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

Application deadlines are August 1 for the fall semester and December 1 for the spring. **Foreign students** must apply earlier: June 1 to be considered for fall admission, November 1 for spring admission. Notify the foreign student advisor for application procedures and forms.

The university reserves the right to defer admission of 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, Box 2201, SDSU, Brookings, SD 57007. Phone: (605) 688-4121.

Admission Requirements

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

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

High School Students or Current Graduates

(1) **High school degree or equivalent before enrollment as a full-time student is required.** (You can be considered for admission following completion of your junior year in high school.)

(2) **Complete the American College Test.** (Applicants two or more years beyond high school are exempt from this requirement.) High school students are encouraged to complete the ACT late in their junior year or early in their senior year.

(3) **South Dakota residents** — You will be admitted if you rank in the upper one-half of your high school class OR if you complete the ACT with a composite score of 21 or above.

(4) **Reciprocity approved Minnesota residents** — You will be considered for admission under South Dakota resident admission requirements.

(5) **Out-of-state students** — You will be admitted if you rank in the upper one-half of your high school class OR if you complete the ACT with a composite score of 22 or above.

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

Unqualified candidates — Those who do not meet the above requirements should contact the Office of Admissions for special application details. Twenty-five underqualified students can be admitted each fall. Regular and supplemental applications are required by April 1. Underqualified candidates for junior college programs (1-2 years) will also be considered for special admission if they provide supplemental information demonstrating potential for success in college.

Transfer Students

You are considered a transfer student if you have enrolled for any college level coursework, whether full-time or part-time, since graduation from high school.

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).

(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 credit may satisfy college curriculum and university graduation requirements if grades are C or above and if course content is comparable. Acceptance of credit from a junior college will normally be limited to 64 semester credits. College or university accreditation shall be determined in accord with American Association of College Registrars and Admissions Officers publication. The acceptance of transfer credit from non-accredited colleges will be provisional and subject to validation by testing or subsequent course work.

Former Students

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

Certificate or Examination

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

Special Students

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

Students With a Break in Education

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

Admission with Advanced Placement

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

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

Foreign Students

SDSU is dedicated to providing educational opportunities for foreign students. To facilitate admission, you should complete a preliminary application. You should make arrangements to take the TOEFL (Test of English as a Foreign Language) and have results sent to SDSU. Information on world wide test center locations and registration is available from American Embassy, Consulate, or TOEFL, Box 899, Princeton, NJ 08541, U.S.A. Upon receipt of a preliminary information form and TOEFL results the Foreign Student Advisor Office will contact you with further information and instructions.

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

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

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

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

Correspondence Credit

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

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

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

Policy for Transfer of Undergraduate Credit

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 the accepting institution. Course credits are acceptable for transfer if completed with a passing grade.
   - A. Academic courses will be transferred as meeting graduation requirements if the courses parallel requirements for the degree or if the courses meet electives required for the degree. Credit will not be given for duplication of courses.
   - B. Remedial courses, vocational courses, orientation, life experience, and high school level courses are not accepted for transfer credit. No transfer credit is granted for General Educational Development Tests. Where vocational courses are applicable to an individual's degree program, credit may be accepted upon the approval of the Dean of the college in which the student is enrolled.
   - C. Credit earned for college level courses by examination, extension, correspondence, USAFI, etc. will be evaluated and accepted for transfer if equivalent to courses at and consistent with the policies of the accepting institution.
   - D. When a course has been repeated for credit, the last grade earned will be used in the evaluation of the acceptance of credit.
   - E. Transfer credit for work at a junior or community college (2 year) may not exceed one-half of the hours required for completion of the baccalaureate degree at the accepting institution. 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 the accepting institution.
3. General educational requirements successfully completed at the sending institution within the South Dakota higher education system will be accepted towards meeting these requirements for similar degree programs at the accepting institution within the system.
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 system of the receiving institution. Each institution may establish grade-point average requirements for graduation, honors, and academic standing based upon the work of the student at the receiving institution in addition to the cumulative credit and grade requirements. If a grade of F or the equivalent was received in a course otherwise transferable within this policy, the cumulative grade point average shall be calculated incorporating the "F" grade.
5. The President or his designee is responsible for insuring that regential 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

Definition and Clarification of Fees and Refunds

Application Fee — Non-refundable charge assessed all applicants for admission unless you have attended another S.D. public college or university.

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

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

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

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

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

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

Tuition, Living and Other Expenses

All charges listed are subject to change pending Regents action

	Resident	Non-Resident
Tuition — undergraduate on-campus per semester credit	$ 24.48	$ 54.00
graduate on-campus per semester credit	$ 36.75	$ 69.30
Instructional Fee per credit	.75	
University Student Fee — per semester per credit, (limit 12)	7.80	
Board, per semester		
Plan 1	$289.00	
Plan 2	$314.00	
Plan 3	$332.00	
Plan 4	$350.00	
Plan 5	$368.00	
Plan 6	$386.00	
Plan 7	$404.00	
Resident Hall Rent, per semester (includes phone)		
All halls (double room)	$326.00	
Single occupancy	$461.00	
Books and supplies (estimate), per semester	$150.00	

TYPICAL EDUCATION EXPENSES (ONE SEMESTER) FULL TIME UNDERGRADUATE

Tuition — 16 credits	$391.68	$864.00
University Student Fee — health service, Union, Student Association, Instructional	$105.60	
Books and supplies	$150.00	
Board (average plan)	$350.00	
Residence hall rent (including Telephone charge)	$326.00	
	$1,328.28	$1,795.60

INITIAL PAYMENTS REQUIRED FOR NEWLY ENROLLING STUDENTS:

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

Registration day each student makes a partial payment of charges ranging from $25 to $850 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.

Student Housing and Food Service

Residence Halls at SDSU are living and learning centers where you are challenged to develop as individuals, as well as to study and to meet other students. The Director of Housing, assisted by a central staff, seven Residence Hall Directors, and 16-18 Resident Assistants in each hall, administers programs, staff, and facilities. The housing staff will assist you with questions regarding nearly any area of the University. Each hall has a desk which contains a variety of equipment for check out. Complete information and policies are printed in Residence Hall Information, a book distributed with contracts as well as in each residence hall room when you check in. Normally students reside in residence halls for two years. The Central Housing Office is located in Wecota 115. The telephone number is 605-688-5148.

Residence Halls — Normally, if you are not married and your parents or guardians are not Brookings residents, you are required to enter housing agreements with the university. Currently, students who have completed four (4) semesters of full-time enrollment at an institution of post high school education or who are two years beyond high school are excused from this requirement. University residence hall facilities rent for $652 to $922 per academic year. Usually, two students are assigned to each room. Students who do not reside in on-campus university facilities may seek assistance from the student association off-campus assistance office.

Residence Hall Advanced Payment — An application for housing is not processed until you have been admitted to the university and have submitted a $50 Advance Housing Payment. The $50 payment will appear as a credit on your final fee slip. Refunds will be made only if written cancellations are received prior to July 1 for fall semester and December 1 for spring semester.

Family Student Housing — 80 one-bedroom apartments and 8 two-bedroom apartments are available for rent on the campus. Rent for one-bedroom unfurnished apartments range from $97 to $129 a month. Rent for the two-bedroom unfurnished apartments is $152 a month. Unfurnished apartments do include refrigerator, stove, and all the utilities. Some furniture items are available for rent at a nominal charge. Admission to the university is required before you can be placed on a waiting list or an assignment made. Contact the Student Housing office for more information.

Food Service

All students living in residence halls participate in university food service. Other students may contract food services at established rates.

Residency Requirements

Qualifications for residency for tuition purposes may be obtained by writing this Admission 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.

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
FY 1983

Student's Actual Attendance From First Day of Schedules 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 the remaining financial aid programs awarded subject to Federal funding. You must reapply for financial aid every academic year. Also, financial aid transcripts are required for all postsecondary school transfer students.

Students must maintain satisfactory progress as defined by the SDSU Financial Aid office and remain in academic good standing to receive financial aid.

I. Scholarships

A special application must be returned to the Financial Aid office by January 15th to be considered for general SDSU scholarships. Over 850 scholarships are awarded annually to SDSU students through most departments based on academic achievement and talent performance. Scholarship recipients are notified in April with limited supplemental scholarships awarded during the summer and the school year.

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

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

Agriculture: B. L. Brage, Associate Dean, College of Agriculture and Biological Sciences, SDSU.

4-H: County agents or Joseph McAullife, Program Leader, SDSU.

Air Force ROTC: Professor of Aerospace Studies, SDSU.

Army ROTC: Professor of Military Science, SDSU.

Athletics: Harry Forsyth, Director of Athletics, SDSU.

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

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

II. State Incentive Grant

III. Basic "Pell" Grants

IV. Supplemental Educational Opportunity Grants

V. Health Profession Loans (Pharmacy)

VI. National Direct Student Loans

VII. Work Study Program

VIII. Nursing Student Loans

IX. Nursing Scholarships

X. Guaranteed Bank Loan

XI. Student Employment

XII. Veterans

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

XIII. Serviceman's Opportunity College (SOC)

South Dakota State University is a member of the SOC network and accepts the need to strengthen off-duty educational opportunities for men and women in the military services. SDSU offers a wide spectrum of programs designed to assist in fulfilling service personnel educational needs. For further information, contact the Admission office or Veteran's Service Officer.

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

SDSU is approved for processing a state program which provides 50% free tuition for national guard students who are eligible. 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 194 major fields or options in six colleges providing over 1700 individual classes specializing and preparing students for countless career opportunities.

Graduation Requirements

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

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

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

Note: No given course may satisfy more than one of these requirements.

A. The General Degree Requirements

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

2. A ratio of at least two grade points per credit hour for courses passed. (Graduation ratio of 2.0). In computing the graduation ratio, all courses for which a grade of A, B, C, D, or E has been earned are used. Students who transfer from another institution must

earn a minimum graduation ratio of 2.0 for the courses taken at South Dakota State University. If a course is repeated, only the last grade received will be computed.

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.

4. Completion of all college and major field requirements.

B. Physical Education

Satisfactory completion of two semesters of PE 100, Fitness and Lifetime Activities (with no duplication of activities) for those entering South Dakota State University as freshman (less than 30 credits). Military service does not fulfill this requirement.

C. The Communications Requirement

1. The written communication requirement: You must complete 6 credits in English, English 101 or 191 the freshman year, and English 300 (for Engineering students, English 300 or 303) for the junior year.

You may exempt English 101 or 191, 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.

You may exempt English 300 by 1) presenting evidence of prior exemption from a second semester of English Composition by an accredited institution, or 2) an acceptable score in the subject CLEP test in English Composition. The form or letter certifying exemption must be signed by the chairman of the institution's English Department and copies must be sent to your advisor, the college dean and the university registrar.

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.

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 **six credit hours** of humanities with the required hours from at least two disciplines.

Humanities

The humanities are broadly defined as courses concerned with the understanding and expression of man's ideas, creative processes and critical human encounters. To encourage and facilitate selection of courses from all aspects, the approved courses are listed in two groups. Those in Section One deal primarily with ideas and attitudes expressed in words while those in Section Two deal primarily with thoughts and feelings expressed through the arts. Students are encouraged to take courses from each section to fulfill their humanities requirement.

Section One

English: All courses **except** 101 or 191, Freshman Composition; 300, Junior Composition; 303, Advanced Composition; 308, Teaching of English; 383, Creative Writing.

Foreign Languages: French 101-102, Introduction to French Language and Culture; German 101-102, First Year German; Spanish 101-102, First Year Spanish.

Honors Colloquim: 100 and 200.

Humanities: All courses.

Philosophy and Religion: All courses.

Section Two

Art: ArtD 112, Lettering; ArtH, All courses; ArtS 112, Drawing II; 113, Drawing I; 122, Design II; 123, Design I; 231, Painting I; 253, Ceramics I; 270, Textile Design; 281, Printmaking I; 370, Weaving; 430, Watercolor.

Dance: All Courses

Interior Design: 211, Art in Today's Home; 424, Historical Backgrounds of Home and Furnishings.

Music: All general, music education, applied and ensemble courses; All 100 level theory courses; All music literature courses except 435.

Nutrition and Food Science: 111, Food and Man.

Recreation: 241, Introduction to Public Recreation.

Speech: All theatre courses; MCom 260, Introduction to Film; 460, Film Narrative; SpDm 330, Oral Interpretation; 360, Indian Oratory and Drama; 442, Advanced Oral Interpretation.

Textiles and Clothing: 372, History of Costume.

Area II, Understanding our Physical and Biological Environment

Satisfactory completion of **eight semester hours** of natural science from at least two disciplines. At least one course must be a laboratory course.

Natural Sciences

The natural sciences include mathematics and the biological and physical sciences that deal with matter, energy, and their interrelationships and transformations. Students are encouraged to select courses from each category.

Biological Sciences

Animal Science: 101, Introduction to Animal Science; 212, Livestock Evaluation; 219, Livestock Management; 223, Animal Nutrition; 241, Meat and Meat Processing.

Biology: 151, Biology; 153, Biology; 271, Heredity and Society; 373, Evolution; 383, Bioethics; 445, Histological Techniques,

Botany: 201, Plant Kingdom.

Dairy Science: 130, Elements of Dairying; 221, Technical Control of Dairy Products.

Entomology: 105, Introduction to Entomology; 191, Household Pest Control; 293, Crop and Livestock Insects; 295, Horticultural Insects; 391, Insect Control Methods; 393, Medical Entomology.

Forestry: 131, General Forestry; 231, Dendrology; 232, Forest Ecology; 331, Farm Forestry.

Horticulture: 111, General Horticulture; 311, Herbaceous Plants; 312, Plant Propagation; 313, Woody Plants.

Microbiology: 231, General Microbiology.

Plant Science: 103, Crop Production; 223, Principles of Plant Pathology I; 233, Weed Control; 253, Field Application and Regulation of Pesticides; 303, Seed and Grain Technology; 312, Grain and Seed Production and Processing: 313, Forage Crops and Pasture Management; 322, Environment and Plant Management; 333, Principles of Plant Pathology II; 453, Mycology.

Range Science: 200, Practical Range Management; 300, Principles of Range Management.

Wildlife and Fisheries Science: 210, Environmental Conservation; 363, Ornithology; 367, Ichthyology.

Zoology: All courses **except** 325, Mamalian Physiology and 383, Embryology.

Physical Sciences

Agricultural Engineering: 353, Physical Climatology and Meteorology.

Biology: 353, Introduction to Oceanography

Chemistry: 100, Chemistry and Mankind; 107, Elementary Glassblowing; 110, General Chemistry; 111, Introductory Organic and Biochemistry; 112, General Chemistry; 114, General Chemistry; 120, Elementary Organic Chemistry; 270, Chemical Calculations.

Geography: 131, Physical Geography; 132, Physical Geography; 210, World Regional Geography; 337, Atmospheric Sciences; 338, Astrogeography; 339, The Earth's Landforms; 396, Course Special — Oceans.

Mathematics: 101, Survey of Mathematics; 111, Algebra; 113, College Algebra and Trigonometry; 120, Plane Trigonometry; 123, Math Analysis I; 143, Finite Mathematics; 222, Calculus for Non-Math Majors; 241, Mathematics of Finance; 271, Computer Programming and Data Processing; 353, Elementary Logic and Set Theory.

Nutrition and Food Science: 141, Foods: Principals.

Physics: 101, Introductory Physics; 103, Descriptive Astronomy; 111, Elementary Physics I; 211, General Physics I.

Plant Science: 113, Soils; 243, Geology.

Area III, Understanding our Social Environment

Satisfactory completion of **nine 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.

Agricultural Economics: 354, Agricultural Marketing and Prices; 479, Agricultural Policy.

Anthropology: 200, General Anthropology; 220, Cultural Anthropology; 421, Indians of North America.

Business Administration: 280, Personal Finance; 350, Business Law I; 351, Business Law II.

Child Development & Family Relations: 101, Family Development; 141, Individual and the Family; 211, Human Development and Personality I: Childhood; 443, Problems in Family Relations and Child Development.

Computer Science: 203, Computers and Society.

Economics: 201, Macroeconomics Principles; 202, Microeconomics Principles; 391, Consumers and the Market.

General Engineering: 231, History of Technology.

Geography: 200, Introduction to Human Geography; 210, World Regional Geography; 212, Geography of North America; 219, Geography of South Dakota; 313, Geography of Latin America; 314, Geography of the U.S.S.R.; 315, Geography of Europe; 316, Geography of Asia; 317, Geography of Africa; 351, Economic Geography; 363, Rural Geography; 425, Population Geography; 447, Geography of the Future; 461, Urban Geography; 476, Historical Geography of South Dakota.

History: All courses **except** 381, Field Experience, 393, Directed Studies; 396, Undergraduate Course Specials; 480, Field Experience and Internship and 492, Special Problems.

Home Economics: 241, Management in Family and Personal Living; 391, Consumers and Market.

Honors: 300, Colloquium in Social Sciences.

Political Science: All courses **except** 368, Introduction to Research Methods; 481, Field Experience; 483, Directed Studies; 492, Seminar and 496, Undergraduate Course Specials.

Psychology: All courses **except** 303, Experiments in Psychology; 356, Psychological Assessment; 401, Psychology Seminar; 488, Practicum for Psychology Technicians; 496, Undergraduate Course Specials and 497, Field Work in Psychology.

Sociology: All courses **except** 471, Social Work Skills and Methods.

College and Major Field Requirements

Completion of courses outlined under the college and major field curricula to the satisfaction of the head of the major department and college dean. Regular full-time students in continuous attendance have the right to graduate under the catalog curriculum in effect when they entered; however, necessary substitutions and additional courses may be required to meet the standards of the major field at the time of graduation.

Student Responsibility

Each student is responsible for satisfying requirements for graduation as listed under over-all university, college and major field requirements. This shall include notifying the Registrar's Office in event any course, other than failed course, is repeated. If a student has questions concerning the proper satisfaction of specific requirements he or she should consult with the dean, major adviser or the registrar.

Foreign Language Policy

Entering students with appropriate backgrounds are permitted to sit for placement examinations, and are placed according to the results of such examinations. Credit will be granted for the exempted portion of the course sequence only if the student completes successfully at least one semester in the language concerned at SDSU. The same course may not be used to meet both the humanities and the foreign language concerned at SDSU. The same course may not be used to meet both the humanities and the foreign language requirement for the B.A. degree.

Class Attendance Policy

1. Attendance will be the responsibility of the student.
2. Whether regular attendance is required will be left to the instructor who must specify requirements at the beginning of the term.
3. The faculty will honor absences approved by university officials where individuals or groups are absent in the interest of the university.
4. Any other absence including sickness is a matter between the student and the instructor.
5. Attendance Records and Reports — instructors should keep attendance as a means of detecting illness, absence from campus, or other matters of importance. Instructors should report to Student Services when several unaccounted for or consecutive absences occur. Additional reports should be made for continued absences until the instructor knows that the cause has been determined and reported. Instructors report total absences for each D or F grade submitted.

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, a student must carry 12 semester credits. You will not be permitted to register in more than 20 semester credits the first term. Registration in more than 20 semester credits in subsequent terms is permitted only when the previous semester's work shows high achievement.

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

University Withdrawals

Those finding it necessary to withdraw from the university are urged to consult with a faculty advisor to work out the best vocational plan possible. You must contact Student Services, Administration Building. Those who leave the university without obtaining an official withdrawal will be reported as having failed the semester's work. Refunds are made only on the basis of the date of official withdrawal (see page 10 of this catalog). The last date to withdraw from this university is two weeks (14 days) before the end of the semester. After that date you may officially withdraw only with the permission of the Vice-President for Academic Affairs.

Trip Regulations

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

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

Certificate of Completion

Offered for the satisfactory completion of work in prescribed areas in the colleges. See Section on general personal studies page 45.

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 continuing education.

Auditing a Course

Registration as an auditor in a course may be permitted. No credits are given. The audit fee is the established tuition rate, The Fee will be waived for all personnel on university contract upon proper authorization at time of registration.

Auditing courses by graduate and undergraduate students must be a matter of record. **Registration for audit will be accomplished only after registration day by add slip procedure.** A report of Satisfactory (E) and Unsatisfactory (F) will be given in each course audited, the basis for the grade to be agreed upon by the instructor and the auditor. Audit courses are counted as part of 20 hour rule for overloads except where prohibited by organization regulations.

Elective Work

Electives are offered so students may develop special talents or interests. The choice of subjects is left to the student, provided the selections made are consistent with the academic standards of the university. Electives used to meet the humanities, social science and natural science degree requirements must be chosen from the approved list.

The dean of the college in which the degree is sought must approve registration in an elective if the subject is counted toward the degree.

Elective courses are offered upon sufficient demand.

Drop-Add Procedure

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

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

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

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

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

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

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

Intercollege Transfer

To transfer from one college to another within the university, you need an "Inter College Transfer" from the Student Services Office, or the Career-Academic Planning Center.

Grading System

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

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

The quality of work is indicated by the following marks:

A — Exceptional — 4.0 grade points; B — Superior — 3.0; C — Average — 2.0; D — Passing (lowest passing mark) — 1.0; E — Satisfactory — 2.0; (not counted in GPA); F — Failure. (You must repeat the subject in a regular class to get a passing mark. Repeating the course will not remove the failure from your permanent record). G — Withdrawal with no grade; H — Withdrawal with failure; X — Grade not reported by instructor. Value same as "F" until removed. I — Incomplete, is a report indicating a) that for some good reason beyond the student's control, work in a subject has not been completed, and b) that the work which has been completed was of a passing grade, and that it is deemed practical for the student to complete the subject without repeating it in a regular class. It is your responsibility to make arrangements with the instructor for meeting the requirements of the course for removal of the incomplete within one year. 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.

Any grade reported to the Registrar may be changed by recommendation of the instructor and permission of the college dean.

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

Military, 1 credit; grade A; grade points 4.

Mathematics, 5 credits; grade B; grade points 15.

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

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

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

Total credits — 17; total grade points — 38.

GPA = 38 divided by 17 = 2.235

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

Repeating a Course to Raise the Grade. If you repeat any course, the new grade replaces the former grade in computing the graduation ratio, but both will remain on your record and count in the cumulative grade point average. You must notify the Registrar's Office when a non-fail course is repeated. Credits and grade points earned for the old grade cannot be counted toward graduation.

Pass-Fail System. You may enroll in up to 12 credits, but not more than one course per semester of pass-fail elective courses.

1. These credits must be outside your major and may not serve to satisfy university, college, or departmental core curriculum requirements.
2. **Registration for pass-fail electives will be accomplished only after registration day by add slip procedure.** Add slip should carry notation "pass-fail

elective."

3. The course must be satisfied in the normal manner — you are responsible for attending class, taking exams, completing assignments.
4. Grades may direct that a mid-term deficiency report be sent and may result in a final grade of "E" (satisfactory) or "F" (fail).
5. The grade received will be recorded on your permanent record but will not count in the computation of the semester or the cumulative grade point average. If the course is passed, the credits and two times the number of grade points will be counted for graduation.
6. You may change from pass-fail elective to credit or vice versa during the two week add period.

Academic Performance Requirements

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

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

A. Probation — At the end of the first semester in which you do not meet the requirements, you will be placed on "scholastic probation." You will not be permitted to serve on faculty-student committees. The dean may require you to carry a reduced load for the next semester.

B. Refused — You will be "refused" upon failure to meet requirements at the end of the probationary semester. Readmission may be possible on a "scholastic probation" status, upon application for readmission, after one semester of nonattendance. If you have been on a refused status twice, you will not ordinarily be permitted to reenroll.

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

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

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

Examination for University Credit

If you have studied a subject independently or have done work of college level for which you are unable to get a transcript acceptable to this institution, you may take a special examination to establish credit under the conditions specified below:

1. Consult the head of the department concerned who will conduct a preliminary survey of the work in which you claim to be prepared, and determine if an examination is warranted, what topics it should cover and what credit may be expected. Laboratory courses or mixed lecture-laboratory courses must have the consent of the instructor in addition.

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

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

4. If credit is accepted by examination the permanent record will show: course name — credit by examination, with an E grade for (a) credits. Course equivalent credit (a) and two grade points per credit will be allowed toward graduation. No entry will be made on the record if the examination is failed. The examination results will not be figured in calculation of either the semester or the cumulative grade point averages.

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

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

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

8. Credit may also be received in certain subjects through the College Level Examination Program (CLEP), the Proficiency Examination Program (PEP), the Advanced Placement Program (APP) or through local standardized tests in Foreign Language and Mathematics. A fee is charged for administration of the CLEP, PEP, and APP tests. For information about credit through any of these programs contact the Testing office in room 323 in the Administration building.

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

Class Rank

1. Sophomore rank requires 30 semester credits toward graduation.

2. Junior rank requires 62 semester credits toward graduation.

3. Senior rank requires 95 semester credits toward graduation.

Graduation Honors

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

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

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

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

Honors shall be of three degrees:

With Highest Honor — grade point avearge 3.80 or above.

With High Honor — gradepoint average 3.60 to 3.799.

With Honor — grade point average 3.4 to 3.599.

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

Available Majors, Minors and Options

Preprofessional areas of study

Key to colleges administering individual curriculums

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

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

The Summer Session

Barbara M. Audley, Director

SDSU offers a wide range of courses and degree programs during the summer months as well as numerous special workshops, short courses, evening offerings, and non-credit programs. Summer programming is offered May through July and is characterized by innovation and responsiveness to your needs. Classes are comfortably sized and more time is available for individual attention from the faculty member. Participants need not be regularly matriculated at SDSU but may be admitted as special students through completion of one short form.

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

Continuing Education Community Service

Barbara M. Audley, Director

Continuing Education/Community Service is the division of the University which serves both the off-campus and the nontraditional student. The goal of continuing education is often described as "life-long learning" and involves providing credit and non-credit learning experiences to students located throughout South Dakota. Other activities include short courses, workshops, conferences and seminars, either for credit, continuing education units (CEU's) or non-credit.

Individuals and groups interested in holding conferences or meetings at the University should contact the Division of Continuing Education/Community Service which will make local arrangements for facilities, financing and obtaining qualified instructors/speakers.

Consulting and technical assistance to communities as well as business and industry is another contribution of SDSU to the social and economic development of the state. Contact Continuing Education/Community Service for information and assistance.

Academic standards and policies governing off-campus courses will be 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.

Continuing Education/Community Service is unique in the field of education in that it is designed to be self-supporting, both for credit courses and non-credit conferences, seminars, short courses and workshops. Tuition for the 1982-83 academic year is $33 per semester hour undergraduate and $41 per semester graduate. Audit cost is the same as tuition. In addition, a delivery fee may be charged to cover unusual costs associated with a specific offering.

For further information and a copy of current publications, please contact the Continuing Education/Community Service Office, PC 201, 688-5193.

The Graduate School

Christopher P. Sword, Dean

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

The Graduate Faculty is composed of the President, Vice President for Academic Affairs, Graduate Dean, academic deans, heads of departments in which graduate courses are given, and other faculty chosen on the basis of their background and experience. Graduate Faculty members are authorized to teacher graduate level courses and to serve as advisers to graduate students or on advisory examining committees.

Graduate Credit for Seniors

A senior within 15 credits of completing the undergraduate curriculum with a grade point average of 2.5 or a junior-senior grade point average of 3.0 may receive credit for graduate courses in addition to the courses necessary to complete undergraduate work. Course load may not exceed 18 credits. Courses must be designated for graduate credit at the time of registration. Forms requesting permission to register for these courses are available at the Graduate office. Permission to take courses for graduate credit while a senior does not constitute admission to the Graduate School.

Admission to the Graduate School

For information regarding admission to the Graduate School, departments offering graduate instruction, graduate courses available, as well as information on graduate fellowships and assistantships, write the Dean of the Graduate School for the latest Graduate Bulletin.

Campus Services to Assist the University Community

Student Services Division

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

Admissions — Questions concerning enrollment information, admission and transfer evaluation should be directed to Admission office, room 200, Administration building, telephone number 688-4121.

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

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

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

SDSU is also approved for processing a state program which provides 50% free tuition for national guard students who are eligible. If you have questions concerning this program, please contact the Veterans Service office.

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

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

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

Counseling Service — The staff will work with you in one-to-one sessions and groups on matters of personal-emotional growth and vocational choice. Call 688-6146, or stop in at West Hall room 101, for information on the following programs and services: counseling; personal, emotional and vocational programs; human sexuality; Help phone; human relations training; test anxiety management; structured groups (i.e. pairing, assertiveness, relaxation). The Center is accredited by the International Association of Counseling Services.

Health Service

All usual outpatient services including laboratory work are provided plus limited infirmary care. More extensive care, diagnosis and hospitalization will be arranged by referral. Your activity fee will cover most outpatient care costs. A supplemental hospitalization accident and sickness insurance program is available at registration. The Health Service is located on the second floor of West Hall and is open to you from 7:00 a.m. Monday until 7:00 a.m. Saturday when school is in session. On weekends during the semester you may go to the Brookings Hospital emergency room and receive partial reimbursement from Health Service.

You may call 688-4157 for further information or to arrange an appointment.

Career Planning and Placement Services

Planning for the type of career you want after graduation should begin the moment you sign up for your first class at SDSU. The office in West Hall has vocational testing, career development programs and job market information to help you plan early so we can better help you find a job later.

University Student Union

This is the focal point for your activities. In addition to housing the S.A. Bookstore, cafeteria, and meeting rooms, the union includes a ballroom, coffee house, student association and publications offices, craft center, game room, outing center, University Cultural Entertainment office and Ticket office. Phone 688-6127 for information or 688-4022 for central scheduling.

Cultural-Entertainment Office

The University Cultural Entertainment office is responsible for coordinating programs sponsored by the Student Union Council, University Cultural Entertainment Committee, Harding Distinguished Lecture Committee, and Fine Arts Committee. Whether it's program information or season tickets, this office can provide it. Both the Ticket office and the University Cultura Entertainment Coordinator are located in th Student Union, 688-6173.

Academic Support Services

Instructional Media

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

Instructional media services are located in 4 facilities and include a film library, photo lab, equipment distribution and production center, closed circuit television, the Dial Access Center, and computer instructional services.

The film library and photo lab are located in Pugsley Hall 101. The film library boasts of a film collection of approximately 2500 films and a large collection of slides, filmstrips, and audio tapes.

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

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

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

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

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

The Computer Uses in Education Committee is advisory to the Assistant to the Vice President for Academic Affairs in matters of policy and use of the Terminal Center. Questions about use may be directed to the supervisor of the Center and/or the committee chair.

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

Hilton M. Briggs Library

The SDSU library, named for President Emeritus Hilton M. Briggs, moved into a new three level, 4 million dollar building in the summer of 1977. The library collections consist of more than 325,000 bound volumes, 285,000 government documents, and additional holdings of microfilm, microcards, microfiche, maps, newspapers, and pamphlet materials. More than 3,100 different periodical titles are received currently. Book and periodical holdings are available on open stacks for the use of patrons during the 95 hours per week the library is open.

Cooperative Education Program

The University's Cooperative Education program provides the student an opportunity to integrate classroom study with planned and supervised professional work experience which takes place outside of the formal classroom and is related to the student's field of study. Work experience usually takes place off campus and is provided through periods of employment with cooperating business, industrial, and governmental agencies.

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

Program requirements vary from one academic department to another. Requirements to be considered usually include year in school, grade point average, and academic courses completed. Academic credit is generally awarded through a 494 course number; however, the amount of credit granted varies from one department to another.

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

Detailed information is available from the Cooperative Education office in the Administration building.

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.

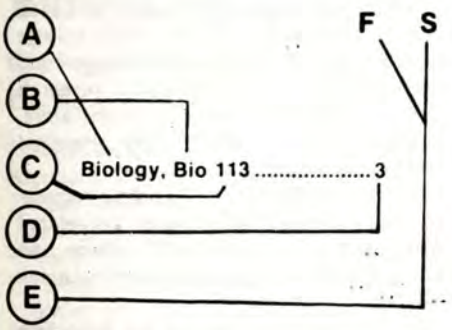
Complete details concerning disciplinary procedures and regulations pertaining to residence halls, parking and traffic, student organizations and activities will be found in the Student Policies Manual.

Copies of the manual are available at the President's office, each Dean's office, the Student Union, the Residence Halls, and the Student Services 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 113 under the Biology Department.

C Course number. The first digit of the three-digit number indicates the level of instruction, as follows:

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 the two 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

113 Biology 3 (1, 4) FSSu

Concepts of modern biology as they are related to living organisms.
Emphasis on molecular and cellular organization of living organisms.

1 Course number.

2 Course name.

3 Number of semester credits assigned to the course.

4 The first number inside the parenthesis indicates the number of recitation hours per week and the second number is the number of laboratory hours per week that the course requires.

5 Semesters in which the course is taught. F = Fall; S = Spring; Su = Summer.

6 A brief description of the course. This section will also include other information affecting your enrollment in the course. A course description might include, for instance: "P, Math 333." This means that Math 333 is a prerequisite and must be taken before enrollment in this course. Other information included in various course descriptions would be: "Alternate years," "Not open to majors," "May be repeated for a total of six credits," etc.

Miscellaneous Abbreviations

dmin, administration
dv, advanced
g, Agriculture
m, American
Y, alternate years
, and
hem, chemistry
omp, composition
lev, 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 an opportunity through programs for those who do not find it advisable or possible to enter a regular four-year college curriculum to obtain some college education and at least a part of the college experience.

The one-year program can be arranged in certain areas of your interests.

The program, if approved by the department head and the college dean and completed by you will lead to certification.

The two-year Associate Degree program is primarily concerned with the application of established scientific knowledge and technical skills gained from laboratory experience and related classroom studies.

The core requirements for Associate Degree programs are as follows:

	credit
Major field	16
Minor field	12
Constants:	
English	3
Speech	3
Physical Education	2
Science, Math or Language	6
Electives (minimum)	22
Total Credit (minimum)	64
Graduation Ratio	1.9

These requirements meet the basic elements of the Associate Degree. The major field may be set up to meet your individual needs with the major department head. The approval of the minor department head is necessary in some programs before the degree is granted. Individual study outlines are set up for all terminal programs including those outlined in this catalog.

Minor fields of study are recommended in the core requirements, but are not required of all Associate Degree candidates.

Where the outlined course is completed as recommended, the minor field of study is omitted.

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.

Associate Degree Programs in Engineering

Facilities at the Engineering College make it possible to offer programs in Drafting, Surveying, Manufacturing Technology, and Pre-Architecture. Two-year programs are planned whereby existing college courses are selected which will make you most qualified for the work you select. The types of courses that are recommended for you are technical in content and include laboratory work in the practical application of scientific data. Subject areas include basic communications, graphics, sciences, surveying and shops, etc., which results in making you more marketable immediately after the early college years for specific jobs such as engineering aids, draftspersons, surveyors, research assistants, inspectors, production operators, and other positions where basic practical knowledge is essential.

After completion of the two-year requirement, you may then enter industrial or related employment or continue with college and obtain a degree in engineering or other areas of study.

Since all courses taken for the Associate Degree are college credit courses, most or possibly all of the courses taken can be used to satisfy requirements for graduation with a Bachelor's degree in other areas, or as may be the case in engineering, these courses provide an added background, breadth, and experience in practical fields which become very useful.

The specific course requirements for respective programs follow.

Drafting

College of Engineering

L.G. Skubic, Program Coordinator

Freshman Year	**F**	**S**
Algebra, Math 111 or 113	3(5)	
Plane Trigonometry, Math 120 or 113		3(5)
Fr. Comp, Engl 101 or 191; and Speech, SpCm 101	3	3
Engineering Design Graphics I-II, EG 121, 122	2	2
Machine Shop, ES 121, or ES 225, 222	2(1)	2
Welding, ES 131 or ES 235	2(1)	
Design I, ArtS 123 or ArtS 113	3	
Drawing I, ArtS 113 or ArtS 123		3
Fitness & Lifetime Activities, PE 100	1	1
Engineering Orientation, GE 110	0	
Electives	x	x
Sophomore Year		
Elementary Physics I-II, Phys 111, 113	4	4
Machine Tool Drawing, EG 233	3	
Architectural Design Drafting, EG 223		3
Electronics for Everyone, EE 120	2	
Prin. of Econ, Econ 201		3
Computer Programming CSc 112, 212 or 271		1(4)
Materials, CE 211 or 216, or ME 241 or EE 265	2(3)	
Technical Sketching, EG 231		1
Elementary Surveying, CE 106	3	
Electives	x	x

Suggested Electives

Humanities; Social Sciences electives; Calculus (Calculus for Non-Math Majors), Math 222; Continuation of regular Math sequences; Continuation of CSc sequences; General Chemistry, Chem 110, 120; Engineering Materials, ME 241; Electrical Materials; EE 265; Materials, CE 216; Graphic Mechanisms, EG 234; Shop ES 241; Cartography, Geog 383; Special Problems, GE 290, 1-3 credits. Special Topics GE 270, Creative Design in Ag. Eng., AE 202.

Manufacturing Technology

College of Engineering

L.G. Skubic, Program Coordinator

Freshman Year	**F**	**S**
Algebra, Math 111 or Math 113	3(5)	
Plane Trigonometry, Math 120 or 113		3(5)
Fr. Comp, Engl 101 or 191 & Speech, SpCm 101	3	3
Engineering Design Graphics I-II, 121, 122	2	2
Machine Shop, ES 121 or 225, 222	2(1)	2

Welding, ES 131 or 235, 232	2(1)	2
Fitness & Lifetime Activities, PE 100	1	1
Orientation for Engineers, GE 110.	0	
Electives	x	x
Sophomore Year	**F**	**S**
Elementary Physics I-II, Phys 111, 113	4	4
Machine Shop Problems, ES 223		1
Welding & Metallurgy, ES 233, Welding, ES 232	2	
or ME 241	2(3)	
Technical Sketching, EG 231		1
Graphical Mechanisms, EG 234 or Creative Design in AE, AE 202, or Machine and Tool Dwg, EG 233	3 or	2
Computer Programming CSc 271; or CSc 212; or Calculus, Math 222		4(5)
Macroeconomics Principles, Econ 201	3	
Materials, CE 211 or 216, or ME 241, EE 265	2(3)	
Computer Programming, CSc 112 or 212	1	
Electronics for Everyone, EE 120	2	
Electives	x	x

Suggested Electives

Humanities; Social Science electives; Calculus (Calculus for Non-Math majors), Math 222; Continuation of regular Math sequences; Continuation of CSc sequences; General Chemistry, Chem 110, 120; Engineering Materials, ME 241; Electrical Materials, ME 241 Electrical Materials EE 265; Farm Power and Machinery, MA 213; Materials, CE 216; Woodworking, IAE 191; Shop ES 241; Special Problems, GE 290, 1-3 credits; Cabinet Making, IAE 494, 2 credits. Special Topics, GE 270.

Surveying

College of Engineering

C.A. Tiltrum, Program Coordinator

Freshman Year	**F**	**S**
Algebra & Trigonometry, Math 111 & 120	3	3
or Algebra & Trigonometry, Math 113	(5)	
Fr Comp, Engl 101 or Speech, SpCm 101	3	
Engineering Design Graphics I-II, EG 121-122	2	2
Machine Shop, ES 121 or Welding, ES 131		2
Physical Geography, Geog 131	4	
Elementary Surveying, CE 106		3
Orientation for Engineers, GE 110	0	
Fitness & Lifetime Activities, PE 100	1	1
Physical Geography, Geog 131	4	
Geology, PS 243		3
Electives	4	2
Sophomore Year		
Elementary Physics I-II, Phys 111-113	4	4
Engineering Surveys, CE 208	3	
Materials of Construction, CE 211 or CE 216	2 or	3
Macroeconomics Principles, Econ 201	3	
Money & Banking, Econ 330		3
Fund of Speech, SpCm 101 or Fr Comp, Engl 101	3	
Photo Interpretation & Photogrammetry, CE 306		3
Land Surveying, CE 307	3	
Electives	2	3

Suggested Electives

Humanities; Social Science electives; Computer Programming and Data Processing, Math 271; Calculus (Math for Non-Math Majors), Math 222; Continuation of regular Math sequences; Computer Programming, CSc 212; Continuation of Computer Programming sequences; General Chemistry, Chem 110, 120; Technical Sketching; EG 231; Architectural Design Drafting, EG 223; Special Problems, GE 290. Cartography, Geog 383.

Aviation Education (Avia)

College of Arts and Science

Ralph Lindsay, Coordinator

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

270 Introduction to Aviation 3(3,0) FSSu

Aerodynamics, principles of flying, civil air regulation, meteorology, radio and navigation.

272 Intermediate Flight Training 2 FSSu

Pre solo time and dual cross-country requirements completed. Preflight and post-flight briefings held with each flight. P, Avia 270. Fee $400.

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 $400.

Secretarial Science (OEd) (Office Education)

Division of Education

Associate Professor Schultz, Assistant Professors Madson, Pylman

Minor in the Bachelor of Science or Bachelor of Arts degree. Secretarial Science may be selected as a minor in either degree. Courses for the minor should be selected upon consultation with an advisor in the secretarial science section. A total of 16 credits is required for the minor. Those planning to qualify to teach secretarial science of business subjects in high school should take 24 credits, and consult an advisor in the secretarial section.

Associate Degree program. Designed to prepare you for office clerical secretarial and/or information (data and word) processing positions. The program consists of a background in general education courses and specific Office Education courses.

Programs to fit individual needs may be arranged with the student's advisor.

Curricula for A.A. Degree
Secretarial Option

Freshman Year	F	S
Fr. Comp., Eng 101 or 191	3 or	3
Intermediate Typewriting, OEd 112	2	
Advanced Typewriting, OEd 213		2
Office Machines, OEd 132		2
Business Mathematics, OEd 120.	3	
Shorthand I-II, OEd 121-122	4	4
Fund. of Speech, SpCm 101	3 or	3
Fitness & Lifetime Act., PE 100	1	1
Science, Mathematics, or Language	3-4	3-4
Sophomore Year		
Office Procedures, OEd 242	3	
Shorthand III, OEd 223	4	
Secretarial Practices, OEd 243		3
General Psychology, Psyc 101	3 or	3
Business Correspondence, OEd 246		2
Intro Data Processing, OEd 252		3
Plus 6 credits of the following:		
Shorthand IV, OEd 224		4
Word Processing, OEd 298	2 or	2
Data Entry, OEd 134	2 or	2
Accounting, Actg 210	3 or	3
Cooperative Education/Office Practicum, OEd 294	1-6 or	1-6
Business Law, BAd 350	3 or	3
Advanced Machine Transcription	2 or	2
Electives to Total	64	
Graduation Ratio	1.9	

Curricula for A.A. Degree
Data Processing Option

Freshman Year

Same as Secretarial Option except substitute Intro Data Processing and Data Entry for Shorthand I & II

Sophomore Year	F	S
Office Procedures, OEd 242	3	
Secretarial Practices, OEd 243		3
Business Correspondence, OEd 246		2
Advanced Machine Transcription OEd 133	2 or	2
Word Processing, OEd 298	2 or	2
General Psychology, Psyc 101	3 or	3
Plus 6 credits of the following:		
Accounting, Actg 210	3 or	3
Business Law, BAd 350	3 or	3
Personal Finance, BAd 280	3 or	3
Shorthand I-II-III, OEd 121, 122, 223	4	4
Cooperative Education/Office Practicum, OEd 294	1-6 or	1-6
Computer Programming — See Computer Science Curriculum		
Principles of Economics, Econ 201	3 or	3
Electives to Total	64	
Graduation Ratio	1.9	

One-Year Clerical Program

	F	S
Freshman Composition, Eng. 101 & 191	3 or	3
Intermediate Typing, OEd 112	2	
Advanced Typing, OEd 213		2
Office Machines, OEd 132		2
Fundamentals of Speech, SpCom 101	3 or	3
Physical Education, PE 100	1	1
Business Correspondence, OEd 146		2
Business Mathematics, OEd 120.	3	
Plus 6 credits of the following:		
Shorthand I, II, OEd 121, 122	4 or	4
Office Procedures, OEd 242	3 or	3
Advanced Machine Transcription, OEd 133	2 or	2
Data Entry, OEd 134	2 or	2
Word Processing, OEd 298	2 or	2
Cooperative Education/Office Practicum, OEd 294	1-6 or	1-6
Principles of Accounting, Econ 201	3 or	3
Introduction to Data Processing, OEd 252		3
Business Law I, BAd 350	3 or	3
Electives to Total	32	
Graduation Ratio	1.9	

Undergraduate Courses

111 Beginning Typewriting 2(0,5) F
Only for those with no previous instruction in typing.

112 Intermediate Typewriting 2(0,5) F
Typewriting of business letters, manuscripts, tabular matter and documents. P, 111 or equivalent.

120 Business Mathematics (3) S
Use of the electronic calculator to solve common business problems. Includes payroll, simple and compound interest, pricing, financial statements, percentage, income tax and metric units.

121 Shorthand I 4(3,2) F
Gregg Shorthand, Diamond Jubilee Series. Presentation of shorthand theory as well as beginning procedures necessary for speed and transcription. This course is preferably available to those with no previous shorthand instruction.

122 Shorthand II 4(3,2) S
Review of theory; dictation and transcription. P, 121 or one year of previous shorthand instruction.

132 Office Machines 2(1,3) F
Stencil, spirit, offset, photo-copy and IBM transcribing machines; kinds and uses, operation. P, ability to type.

133 Advanced Machine Transcription (1,2) S
Development of proficiency in operation of dictating and transcribing machines. Development of a knowledge of business vocabulary with rules of grammar, punctuation and spelling as applied to business documents. Student will develop expertise in word processing skills. P, 132 or equivalent.

134 Data Entry 2(1,3) FS
Operation of Data entry equipment. Development of basic understanding of relationship to computing equipment. P, ability to type.

213 Advanced Typewriting 2(0,5) S
Increasing speed and accuracy. Business forms, correspondence production, statistical reports, legal papers. P, 112 or equivalent.

223 Shorthand III 4(3,2) F
Emphasis on transcribing mailable copy, utilizing shorthand dictation for speed and accuracy, grammar, spelling and punctuation typing. P, 122 or equivalent.

224 Shorthand IV 4(3,2) S
Emphasis on dictation for speed and accuracy. Continuing the development of producing mailable copy transcription. P, 122 or equivalent.

242 Office Procedure 3(2,3) F
Special emphasis on filing. Production work in the individual student's special interest area of medical, legal, or general office work with specialized vocabulary. P, 213 or consent of instructor.

243 Secretarial Practices 3(2,3) S
Office procedures, duties, ethics and responsibilities of a secretary are emphasized; office organization and management. P, 213, or consent.

246 Business Correspondence 2(2,0) FS
Business letter writing, organization of correspondence, resumes, letters of application. P, freshman English.

252 Introduction to Data Processing 3(3,0) FS
Survey of computer history and potentialities. Acquaintance with basic principles, terminology, equipment and applications.

294 Cooperative Education/Office Practicum 1-6 FSSu

Planned and supervised professional experience related to Secretarial Science which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

298 Word Processing 2(1,2) FS

Operation of IBM Memory Typewriter. Development of basic understanding of word processing concepts in the modern business office including terminology, job descriptions, employment paths, and workflow.

Printing

Department of Journalism and Mass Communication

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

Curriculum for Associate Degree in Printing

First Year	**F**		**S**
Fr. Comp, Engl 100, 101 or 191 ..	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 Printing, Prtg 112	3		
Composing Machines, Prtg 113 ...			3
Algebra, Math 111 or 112			3
Computers & Society, CSc 203 ...	2		
Second Year			
Typography, Prtg 211	3		
Photography, MCom 160 or 261..	2		
Press & Bindery, Prtg 212	2		
Production & Pricing, Prtg 214			2
Newswriting & Reporting, MCom 210	3	or	3
Lithography, Prtg 213			4
Physical Science			4
Electives to complete 65 credit hours			

General Agriculture

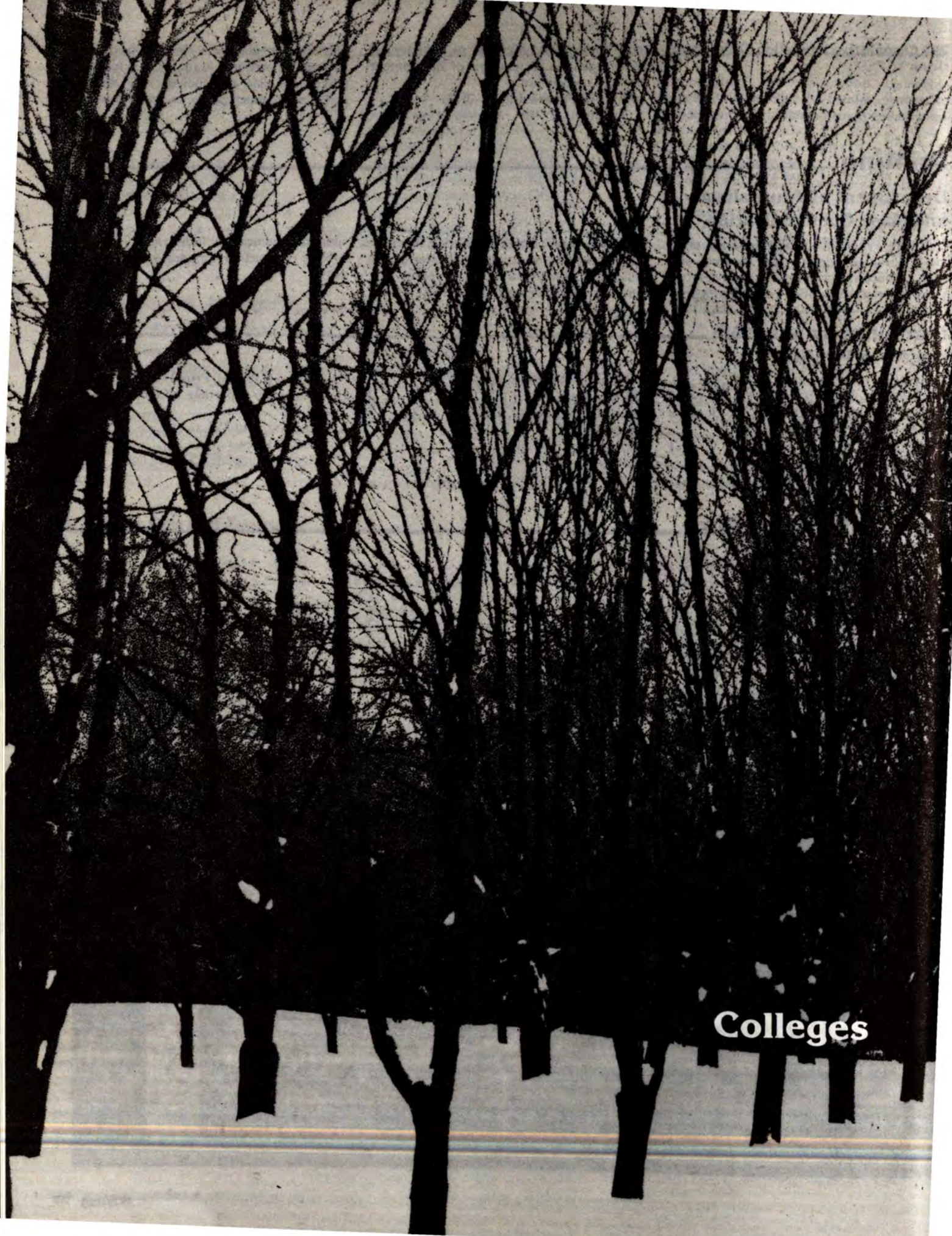
College of Agriculture and Biological Sciences

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

	Credits
English	3
Physical Education	2
Speech	3
Science and/or mathematics	6
Major field*	16
General electives	34
Total	64
Graduation ratio	1.9

*All major courses need not be in one department although this is one possibility. For instance, a major could be general agriculture and therefore, include any agricultural field.

The first two years of the general agriculture program make up an example that fits the definition of a two-year Associate degree program. Examples may include Environmental Management and other more specific majors within the College of Agriculture and Biological Sciences. Check with the department for their major requirements.


Colleges

Agriculture & Biological Sciences

Delwyn D. Dearborn, Dean; B.L. Brage, Associate Dean

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

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

Agriculture includes technical, professional, and business occupations dealing with producing, processing, and distributing farm products. The agricultural teachers, agricultural researchers, men and women who produce and supply the farmer with 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, Microbiology, and Wildlife and Fisheries Sciences. One also must realize that biological science is an integral part of all departments that deal with plant and animal sciences. Many future biology teachers, wildlife biologists, plant and animal physiologists and geneticists will find the program in biological sciences a fruitful one to follow.

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

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

Freshmen may enter these curricula without specifying a major. You, however, should make your major and option choice by the last semester of the sophomore year. The purposes, objectives, and requirements of various majors and options are outlined in the discussions under the various departments. If at any time you desire a change in major and/or option, you should report to the associate dean of resident instruction for adviser reassignment.

You must complete a minimum of 25 semester credit hours in courses numbered 300 or above to qualify for the B.S. degree. Mathematical Analysis 224-225 may be counted toward the total.

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

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

Agriculture and Biological Sciences Curricula

Core Curriculum in Agriculture

Leading to the Bachelor of Science degree

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 Science
Biology	Biological Science	Biology
Botany	Agriculture	Biology
Crop Science	Agriculture	Plant Science
Dairy Manufacturing	Agriculture	Dairy Science
	Biological Science	Dairy Science
Dairy Production	Agriculture	Dairy Science
Entomology	Agriculture	Plant Science
Environmental Mgmt	Biological Science	Biology
General Agriculture	Agriculture	Dir. of Resident Instruction
Horticulture	Agriculture	Horticulture-Forestry
Landscape Design	Agriculture	Horticulture-Forestry
Mechanized Agriculture	Agriculture	Ag Engineering
Microbiology	Agriculture	Microbiology
	Biological Science	Microbiology
Park Management	Agriculture	Horticulture-Forestry
Pest Management	Agriculture	Plant Science
Plant Pathology	Agriculture	Plant Science
Pre-Forestry		Horticulture-Forestry
Pre-Veterinary Science		Veterinary Science
Range Science	Agriculture	Animal Science
Rural Sociology	Agriculture	Rural Sociology
Soil Science	Agriculture	Plant Science
Wildlife & Fisheries Sci.	Biological Science	Wildlife & Fisheries Science
Zoology	Agriculture	Biology

Course	F	S
Fitness & Lifetime Activities, PE 100		2
Communications		11
Fr. Comp, Engl 101 or 191 & 300	6	
Fund. of Speech, SpCm 101	3	
Communications elective†	2	
Social Science	9	
Intro. to Sociology, Soc 100	3	
Macroeconomics Principles, Econ 201	3	
Social Science Elective*	3	
Humanities electives*		6
Science & Mathematics		17
4 credits chemistry, excluding Chem 100††		4
Algebra, Math 111 or Algebra & Trigonometry, Math 113	3 or 5	
Introductory Physics, Phys 101 or Elementary Physics, Phys 111 or Gen Physics, Phys 112	4	
Biological Science‡	3	
Science &/or Math electives to total 17 hours§		
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: Advanced Exposition, 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; Public Speaking, SpCm 315; Discussion, SpCm 334; Parliamentary Procedure, SpCm 335.
*See approved listing.
††Those students following Microbiology, Entomology, Pre-Veterinary Science, Soil Science or Zoology majors must take Chem 112.
‡ Students must choose courses from the Departments of Biology, Microbiology, the fields of Entomology and Zoology, Plant Pathology and 300 level courses in Wildlife and Fisheries Sciences (Ornithology, WL 363; Ichthyology, WL 367) unless specified in the departmental requirements.
§Most department curricula will have specific requirements in this area, but for those which do not, the courses should be selected from the fields of Biology, Botany, Chemistry, Entomology, Geology, Mathematics, Microbiology, Physics, Plant Pathology, Zoology and Wildlife and Fisheries Sciences (Ornithology, WL 363 and Ichthyology, WL 367). Courses in Group I which are of a basic nature, Ent 105, PS 223, cannot be counted toward this requirement unless they are over and above the 12 credit minimum for Group I courses.

Group I Courses in Agriculture

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

Course	Credit
Intro to Animal Science, AS 101	3
Livestock Management, AS 219 or Animal Nutrition, AS 223	3
Poultry Management, AS 366	3
Elements of Dairying DS 130	3
Dairy Foods, DS 231	3
Farm & Ranch Management AgEc 271	4
Intro to Entomology, Ent 105 or Crop & Livestock Insects, Ent 293; or Horticultural Insects, Ent 295; or Insect Control Methods, Ent 391;	3
Gen Horticulture, Ho 111	3
Gen Forestry, F 131; or Forest Ecology, F 232; or Farm Forestry, F 331	2 or 3
Park Admin & Organization, PR 201	3
Landscape Design, La 321	3
Ag Mechanics, MS 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
Practical Range Management, Rang 200	3
Environmental Conservation, WL 210	2

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

Business Option

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

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

*The business electives must be chosen from the following courses: Principles of Accounting II, Actg 211; Personal Finance, B-Ad 280; Business Finance, B-Ad 310; Business Law, I B-Ad 350; Business Law, II, B-Ad 351; Money and Banking, Econ 330; Marketing, Econ 353; Agricultural Marketing, AgEc 354; Marketing Management, Econ 452; Statistical Methods, Stat 341 or equivalent.

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†	9

†Courses must be selected from at least 2 of the following areas: Biology, Botany, Entomology, Microbiology, Plant Pathlology, Wildlife and Fisheries Science 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 county 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

Fitness & Lifetime Activities, PE 100		2
Communications		11
Fr. Comp, Engl 101 or 191, & 300	6	
Fund of Speech, SpCm 101	3	
Communications elective†	2 or	3
Social Science		9
Intro. to Sociology, Soc 100	3	
Macroeconomics Principles, Econ 201	3	
Social Science elective*	3	
Humanities electives*		6
Biological Science		13
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: Advanced Exposition, 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; 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 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 or 191	3	
Fitness & Lifetime Activities, PE 100	1	1
Crop Production, PS 103		3
Algebra, Math 111, or Algebra & Trigonometry, Math 113	3 or	5
Intro. to Animal Science, AS 101	3	
Free electives	9	9
Sophomore Year	**F**	**S**
Gen. Chem, Chem 110 or 112	4	
Farm & Ranch Management, AgEc 271	3	
Fund. of Speech, SpCm 101		3
Entomology elective		3
Macroeconomics Principles, Econ 201	3	
Soils, PS 113	3	
Plant Pathology, PS 223		3
Free electives	3	7
Junior Year	**F**	**S**
Junior Comp, Engl 300		3
Animal Nutrition, AS 223	3	
Intro Biology, Bio 151-153	3	3
Elementary Organic Chem, Chem 120	4	
Gen. Microbiology, Micr 231		3
Intro. to Sociology, Soc 100		3
Social Science Elective*	3	
Free electives (300 level or above)	3	4
Senior Year	**S**	**F**
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 315, 334, 335.
†† To be chosen from the fields of mathematics, statistics, computer science, accounting, or business.

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 Science	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 Science	3(3,0) S (Alt. Yrs.)
553-653	Advanced Genetics	Plant Science	3(3,0) S (Alt. Yrs.)
573-673	Cytogenetics	Plant Science or Biology	3(2,3) F (Alt. Yrs.)
	Graduate Courses		
600-700	Special Topics, for example:		
	Advanced Plant Breeding	Plant Science	
	Advanced Animal Breeding	Animal Science	
	Biometrical Genetics	Plant Science	
	Chromosome Analysis	Biology	
	Developmental Genetics	Biology	
	Human Genetics	Biology	
780	Advanced Special Prob, for example: Lab problems with Drosophila & Neurospora	Plant Science & Biology	
	Applied Genetic Problems	All departments	

*Description given under appropriate department.

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

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

Activities

Both nationally known agricultural fraternities, Alpha Gamma Rho and Farmhouse, are organized on campus and provide living accommodations. Students may pledge any time after the freshman year. During the second 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 SDS 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.

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; Geographny of Latin America, Geog 313; Geography of the USSR, Geog 314; Geography of Europe, Geog 315; Geography of Asia, Geog 316; Geography of Africa, Geog 317; Geography of Ag, Geog 352, World History, Hist 101-102; History of Russia, Hist 345; History of Latin America, Hist 417-418; Am Diplomatic History, Hist 467-468; Intro to Spanish America & Oriental Culture, Hum 213; Nutrition & Man, NFS 111; Human Nutrition, NFS 321; Current World Problems, PolS 253; International Politics, PolS 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

Allen Barnes, Dean; Edward Hogan, Associate Dean

In addition to offering major programs leading to the Bachelor of Arts, the Bachelor of Science and the Bachelor of Music Education degrees in a number of academic and professional fields, the college provides a wide range of "service" courses for students enrolled in the other colleges at SDSU. These courses provide educational prerequisites to the more technical curriculums as well as the general and cultural background for leadership in all fields. Professional schools are placing more emphasis on the liberal arts than has been the case in former years: It is therefore increasingly important that a well-balanced program of general and liberal education be made available to all students.

Organization of the College

The Departments in the College of Arts and Science are organized into broad, general areas of the humanities, social and natural sciences, fine arts and professional. They include Art, Chemistry, English, Foreign Languages, Geography, Health, Physical Education and Recreation, History, Journalism and Mass Communication, Music, Philosophy and Religion, Political Science, Psychology, Speech, Military Science and Aerospace Studies. All majors in the Department of Mathematics are enrolled in the College of Arts and Science although it is administered by the College of Engineering. Many students also enroll in the College of Arts and Science who major in social and natural science disciplines not administered by the college.

Goals

The primary goals of the college are to help you obtain a liberal education; to provide the opportunity to gain an understanding of today's world as an outgrowth of yesterday's and a forerunner of tomorrow's; to provide an opportunity to develop an informed and constructively critical approach to life and the problems of the day.

A liberal education is directed toward a way of life in which one is . . .

. . . Inquiring: vigorously interested in the world in which one lives and understanding of the peoples among whom one lives:

. . . Tolerant: open to ideas whether attractive or not ... trained in the means of gaining more knowledge.

. . . Objective: able to discriminate between that which is honest and good and that which is fraudulent and mean.

. . . Responsible: personally working for the advancement of learning and the improvement of the human condition.

. . . Accomplished: able to communicate effectively, to explain or propound ideas one has evaluated.

. . . Cultured: compellingly interested in and appreciative of the arts.

The Goals of the Student — should be the same as those of the college, but must of necessity also be stated in measurable terms, such as courses and credits and degrees. It is therefore obvious, that students will move toward these goals by varying routes. All students, nevertheless, will become acquainted along the way with the same basic fields of knowledge:

- Communication, language, symbolic systems
- The physical and biological sciences
- The human condition — the social sciences and humanities
- Artistic expression — the fine arts

The graduate should have deepened understanding and sharpened abilities so that as an educated person and an enlightened citizen he/she will:

. . . Understand and respect the integrity of the searching, scholarly investigations on which the advancement of knowledge and the widening of perspective are based.

. . . be prepared to continue study and increase knowledge, whether through continued formal training or through informal reading and self study.

. . . be able to acquire additional specialized training toward professional and vocational objectives.

Advising and Non-Instructional

The college provides many guides toward planning educational programs, both the procedural guides and the counsel of advisers. You are also urged to take advantage of the college's extracurricular educational opportunities such as lectures, concerts, the theatre, art shows, creative writing for the literary and visual arts magazines, oakwood (English and Art Departments), and The Observer (Journalism and Mass Communications Department), participation in physical education skills, foreign language conversation clubs, and departmental organizations.

College of Arts and Science Activities

Dramatics and Forensics

State University Theatre presents a program of major and minor productions each year, and during the summer a season of plays in repertory at its summer home, Prairie Village, Madison, S.D. and credit may be earned.

Forensics: A program of local, regional and national participation in debate, extempore speaking, and oratory is sponsored by the Department of Speech.

Intramural Recreation, Sports Clubs, and Intercollegiate Athletics

The intramural activities office supervises the following clubs: archery, badminton, bowling, dance, fencing, ice hockey, judo, karate, scuba diving, soccer, syncopated swimming and weightlifting.

Intercollegiate athletics for women and men are conducted by the Department of Health, Physical Education and Recreation for all students.

Music Organizations

Concert Choir and Chamber Singers: perform at university events and tours. May obtain credit, audition for membership required.

Jackrabbit Marching Band: provides half-time entertainment for home football games. The "Pride of the Dakotas" has made several half-time appearances at Viking professional football games. May obtain credit, audition for membership required.

The Jazz Bands: A course in jazz techniques and improvisation is made available each semester to all participants involved in the jazz program. Two jazz bands perform in concert several times yearly and sponsor the SDSU Jazz Festival. May obtain credit, audition for membership required.

Orchestra (Civic — University): The SDSU — Civic Symphony draws its personnel from university students (both music and non-music areas), high school students and faculty, townspeople, and people from the surrounding communities. The orchestra presents full concert seasons for the university and Brookings community. Performances include outstanding soloists, standard orchestra repertoire, and significant contemporary works. May obtain credit, audition for membership required.

Symphonic and Concert Bands: Individual auditions are held in November for membership. Each group presents a winter and spring concert, as well as music for various formal assemblies. May receive credit.

The Clarinet Chair and Brass Quintet members are chosen from the major performing bands. May obtain credit.

The Big Blue Brass: The 35 members brass ensemble performs at all home basketball games. Membership is made up of the best brass and percussion musicians on campus. This group performs special musical arrangements written specifically for them. May obtain credit, audition for membership required.

Dakota Debs: A marching group for athletic events.

Oratoria Chorus: The 200-voice chorus performs major choral works with the symphony orchestra. Must audition with the choral director. May obtain credit.

Statesmen: Singing both contemporary and classical music, the 80-voice group provides singing and fellowship for members. Those with interest and ability to sing may join. May obtain credit, audition for membership required.

Publications

The South Dakota Observer and *oakwood*

Military Organizations

Angel Flight: Honorary women's auxiliary to Arnold Air Society. (M & W)

Army Rifle Club: Its goal is to develop safe, highly competent, competitive, small-bore rifle shooters through professional marksmanship instruction and training.

Arnold Air Society: Professional, honorary organization supporting aerospace power.

Association of the U.S. Army, General W.E. DePuy Company: National association designed to inform the civilian community of army activities and promote patriotism in both military and civilian life.

Coteau Rangers: A counter-guerilla unit which provides advanced ROTC Cadets further training and experience.

Pershingettes: Precision drill team auxiliary to Pershing Rifles.

Pershing Rifles: National Honorary Society designed to maintain the highest ideals of the military profession.

Scabbard and Blade: Unites the military departments on-campus and develops the qualities of good and efficient officers.

Society of Military Engineers: National society composed of civilians and military engineers, meeting for the purpose of building better relations between the civilian and military engineering professions.

Honor Organizations

Alpha Epsilon Rho: Professional fraternity dedicated to excellence in broadcasting.

Alpha Lambda Delta: National society for men and women which honors high scholastic achievement during the first year of college.

Alpha Psi Omega: Requires experience in theater productions and a 2.0 grade point.

Delta Phi Delta: National honor society in art.

Gamma Theta Upsilon: International honor society in geography.

Kappa Delta Pi: Recognizes outstanding contributions to education. Must be a junior majoring in education with a 3.0 GPA to join.

Kappa Tau Alpha: Recognizes scholarship in journalism.

Phi Epsilon Kappa: National professional fraternity of men in physical education, health, and recreation.

Phi Kappa Phi: All-University national honor society.

Phi Lambda Upsilon: Promotes high scholarship original investigation in all branches of chemistry.

Pi Kappa Delta: National honorary debate fraternity designed for students with oratory, extemporaneous speaking or debate achievement. Must have one year of collegiate tournament experiences. Credit may be earned.

Psi Chi: Recognized scholarship in the field of psychology.

Mortar Board, Sigma Lambda Sigma Chapter: Encourages scholarship, leadership and character development for senior women and men.

Sigma Delta Chi: Society for Professional Journalists.

Student National Education Association

Men and Women in communications: National fraternity for men and women in journalism and communications.

Departmental Organizations

Alpha Kappa Delta (Sociology)
Amateur Radio Club
American Chemical Society
Microbiology Club
Biological Science Club
Clinical Technology Society
Economics Club
English Club
French Club
Geography Club
History Club
Modern Language Club
Physical Education Club: For physical education majors.
Physics Club
Spanish Club

Alternatives and Options

If you feel the standard approach to a university education is restrictive, the college offers a number of special options and alternatives. Purpose is to broaden your perspectives, to assist you in making practical applications of theoretical knowledge, and to enable you to participate in formulating a portion of your college work. They are also designed to maintain an on-going relevance in your education.

Non-Major Program

Associate Dean Hogan,
committee chairman

You can also pursue either the B.A. or B.S. degree without a major. This allows you as much flexibility as possible.

Purpose of this program is to extend your perspectives and directions and to offer you additional challenges not permitted within the restrictions and limitations of a major program. It is for those students interested in exploring a variety of intellectual and academic areas over an extended period of time. The time factor is vital. It is generally understood that only freshmen and sophomores will have time to enroll in this program.

The university core and the college core are non-major requirements. If you are interested in pursuing this program, consult the associate dean.

This program is designed for the student who feels the need for a broad spectrum of courses to prepare for a career such as those in the business world, the military, or any area which may not require a specific major. Before pursuing the non-major program, you should assume responsibility for knowing what problems may result after graduation. For example, graduate schools and professional occupations may require a specific major or concentration of courses for admission.

The program is administered by a committee of three faculty members, appointed by the dean, chosen from the areas of humanities, social sciences, and natural sciences.

European Area Studies Minor

Dr. Gordon Tolle, Coordinator
Political Science Department

European Studies is an all-university area study program that combines the insights of many disciplines as they are focused on Europe. Primarily these areas include language and literature, history, art, philosophy, music, sociology, economics, political science, geography, health science, professional education, family studies, and organizational studies. For additional information see European Area Studies Minor section, page 95-96.

Indian Area Studies Minor

Dr. Jack Marken, Coordinator,
Department of English

An intercollege program of Native American culture studies. Purposes are 1) draw together courses already taught on this campus into an Indian Studies Program; 2) encourage the enrollment of Native American students by providing a coordinated program in their culture at this university; 3)

provide an opportunity for all university students to learn about the achievements of the American Indian.

For courses already approved for acceptance in the minor see Indian Area Studies Section page 117.

Latin American Area Studies Program

Dr. Merritt Bates, Coordinator,
Foreign Language Department

This is an all-university program that is vocationally oriented. For example, a student declares a first major (agronomy, nursing, music, etc.) and combines it with the Latin American Area Studies Program which provides a second area of concentration. The program enables the student to graduate in four years. It is intended to expand the employment possibilities as well as the humanistic and cultural perspectives of the student in both technical and non-technical university programs. For a detailed description, refer to curriculum in Latin American Area Studies section.

The Directed Studies Program

Directed study in selected topics may be repeated for credit. A maximum of 9 credits is applicable toward the B.A. and B.S. degrees granted by the College of Arts and Science. A directed studies program usually arises from a student's interest in a theme, a field of knowledge or a need to acquire a particular skill which a faculty member is competent but which the interest area is not covered by the regular courses. Subject matter covered varies greatly; therefore, it is planned and implemented jointly by you and the instructor with departmental administrator approval.

The Cooperative Education, Field Experience & Internship Program

Either may be repeated for credit. A maximum of 12 credits is applicable toward the B.A. and B.S. degrees granted by the College of Arts and Science — Prerequisite junior standing or special approval. In an era in which individual needs are receiving greater attention, and in which the educational value of knowledge gained off-campus is increasingly recognized, this program allows and encourages the intermingling of university and community experiences in a unique and important manner. You have the opportunity to become involved in an off-campus cooperative education or internship activity which promises to contribute significantly to your education. You 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 is planned and method of evaluation and grading established by an instructor in consultation with you and under the general supervision of the departmental administrator. The project requires approval of the departmental faculty and the

Arts and Science Curricula

Major and Minor Fields	Options	Department Administering
Art (B.A., B.S.)	Art Education Commercial Art Fine Art	Art
Aerospace Studies Minor (B.A., B.S.)		Aerospace Studies (Air ROTC)
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 (B.A., B.S.) General Economics (B.A., B.S.) Teaching Option	Economics
English (B.A.)	English Education	English
Entomology (B.S.)		Plant Science
European Area Studies Minor (B.A., B.S.) Composite Foreign Language (B.A., B.S.) Individual Foreign Language (B.S., B.A.) French German Spanish	All University program Teaching Option	Foreign Language
Geography (B.A., B.S.)	Environmental Management Urban & Regional Planning Technical Geog-Science Technical Geog-F.Lang.	Geography
History (B.A., B.S.)	Teaching Option	History
Indian Area Studies Minor (B.A., B.S.)	All University Program	
Journalism (B.A., B.S.) Broadcast Journalism News-Editorial	 Science and Technical Writing (B.S.)	Journalism & Mass Communication
Latin American Area Studies (B.A., B.S.)	All University Program	
Mathematics (B.A., B.S.)	Teaching Option	Mathematics
Microbiology (B.S.)		Microbiology
Military Science Minor (B.A., B.S.)		Military Science (Army ROTC)
Music Major (B.A., B.S.) Music Education (B.M.E.)	Choral Instrumental	Music
Non-major (B.A., B.S.)		Arts & Science, Associate Dean & Committee
Health, Physical Education, & Recreation (B.A., B.S.) Physical Therapy (B.S.) Public Recreation (B.A., B.S.) Dance Education Minor (B.A., B.S.) Health Education Minor Athletic Training Minor (B.S.)	Athletic Coaching Elementary Physical Education Concentration Teaching Option Adult Fitness and Cardiac Rehabilitation	Health, Phys Ed & Recreation
Philosophy Minor (B.A., B.S.)		Philosophy & Religion
Physics (B.S.)	Professional Science Teaching General	Physics
Plant Pathology (B.S.)		Plant Science

Political Science (B.A., B.S.)	Teaching Pre-Law Public Administration Law Enforcement General	Political Science
Printing-Education (B.S.) Printing-Journalism (B.S.) Printing-Management (B.S.)		Journalism & Mass Communication
Psychology (B.A., B.S.) Psychological Technician (B.A., B.S.)	Applied Pre-Professional	Psychology Psychology
Religion (B.A., B.S.)		
Restaurant Management (B.A., B.S.)		Nutrition & Food Science
Sociology (B.A., B.S.)	General Teaching Social Work Human Services Law Enforcement	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

Associate Dean. Grades may be based on either the A-F or E-F systems. Upon project termination, copies of the final examination, report, or other evaluation are placed in your file.

The Honors Program

Dr. Jerry Yarbrough, Coordinator,
English Department

This is an all university program. Its main purpose is to stimulate scholarship. For a detailed description refer to the Honors Section of this catalog.

Women's Studies Minor

Dr. Ruth Alexander, Adviser
English Dept.

Provides a coordinated selection of courses offered by participating departments that enable you to construct a program involving the study of women in relation to your own major discipline. It also provides courses that you may elect to increase your understanding of the roles, function and problems of women in American society. May be of particular interest to non-traditional students. For additional details refer to the Women's Studies section, page 168-169.

The Proficiency Testing Program

Offers credit by examination to students who are in a position to fulfill certain requirements. Consult the associate dean of the College of Arts and Science.

The Unpenalized Elective Program

If you feel the need for freedom from the pressure of grades, you may take up to 12 credits of unpenalized electives under the 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. This program creates a vehicle to permit such flexibility and participation. 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 departmental administrators and the associate dean will exercise these supervisory duties. In such cases the **Special** will be cross listed. The project requires the approval of the faculty of the department or departments affected and the associate dean of the College of Arts and Science.

Living and Study Abroad

Dr. David Crain and Michael Funchion,
Co-Coordinators, History Department

Living and study abroad before completing work for the bachelor's degree is both rewarding and stimulating. Information on available programs may be obtained from the counselor on living and study abroad. Opportunities currently include departmental sponsored study tours, experiment in international living coordinated by Prof. Mary Alice Spencer, Music Department, Junior year abroad, special problems, field experience, and directed individual study courses. If you intend to live and study abroad you should determine prior to departure how much credit, if any, will be granted. In the case of department-sponsored tours or courses, you must obtain authorization from the department concerned. In the case of other programs, the counselor on living and study abroad will recommend the amount of credit, if any, to be granted. This recommendation must be aproved by your major departmental administrator and the associate dean of the college of arts and science.

Humanities Course Specials

Dr. Ruth Alexander, coordinator
General Studies in the Humanities
(English Department)

Hum 213, Women in American Culture, 3 credits; Hum 215, Ethnic Literature, 3 credits; Chem 100, Chemistry & Mankind, 4 credits, Geog 447, Geography of the Future (Futurology), 3 credits.

Preprofessional Curricula (Dentistry, Law, Medicine, Etc.)

If you wish to qualify for admission to the professional schools of medicine, dentistry, law and other schools that require pre-professional education you may register in the College of Arts and Science. You should declare a major; for example, Chemistry in Medicine or Political Science in Law, SDSU is fully accredited so transfer credits are accepted at face value.

Courses required by practically all of these schools are available and every assistance is given to you to assure meeting the course requirements of the professional school selected. The Dental Aptitude test is administered each year and arrangements are made for you to take the professional aptitude tests in Law and Medicine.

For additional information see the General Registration section.

College of Arts & Science Degree Requirements

Bachelor of Arts Degree

	Semester Hours
Fr. Comp, Engl 100, 101, or 191	3
Junior Comp, Eng 300	3
Fund of Speech, SpCm 101	3
Fitness & Lifetime Activities, PE 100 (2 semesters)	2
Foreign Languages	

You may fulfill all or part of the foreign language requirement through proficiency testing

(placement). Refer to Foreign Languages section.
Foreign Language requirement 14
Humanities (from approved list) 12
(To be taken from at least two areas with different course prefixes. All foreign language courses may fulfill the college portion of the humanities requirement.)
Mathematics (any math course) 3
Natural Science (from approved list), (To be taken from at least two areas with different course prefixes). One course with laboratory is required 8
Social Science (from approved list) (To be taken from at least two areas with different course prefixes) 12

Bachelor of Music Education Degree	**Semester Hours**
Fr. Comp, Engl 100, 101, or 191	3
Jr. Comp, Engl 300	3
Fund of Speech, SpCm 101	3
Fitness & Lifetime Activities, PE 100 (2 semesters)	2
Mathematics	3
Humanities (Foreign Language recommended) (To be taken from at least 2 areas with different course prefixes)	6-8
Natural Science (from approved list) (To be taken from at least two areas with different course prefixes. One course with laboratory is required.)	8
Social Science, Psychology 101 (3 credits), Anthropology 421 (3 credits), or History 368 (3 credits)	9
Social Science elective (credits from approved list) (To be taken from at least two areas with different course prefixes.)	
Music Curriculum: Basic Musicianship (Theory & Literature)	32
Performance (Applied Music & Ensembles)	21
Senior Recital	0
Music Methods & Pedagogy	12
Professional Education	26

Bachelor of Science Degree	**Semester Hours**
Fr Comp, Engl 100, 101, or 191	3
Junior Comp, Engl 300	3
Fund of Speech, SpCm 101	3
Fitness & Lifetime Activities, PE 100 (2 semesters)	2
Humanities (from approved list) (To be taken from at least two areas with different course prefixes)	8
Mathematics (any math course)	3
Natural Science (from approved list) (Laboratory required in 1 course)	
Biological Science	6
Physical Science	8
Social Science (from approved list; taken from at least 2 areas with different course prefixes)	12

General Arts & Science Requirements

Twenty-three hours are required from approved Division of Education courses for prospective teachers.

The College of Arts and Science requires at least **40 semester credits** of the **128 total** for graduation be upper division (300 and above) credit. This is to assure a minimum of 40 credits in junior and senior level courses. In evaluating transcripts from other colleges and universities, you are given the level of credit according to what was actually earned at the other institution. For example a junior level course may be transferred in as a sophomore course at SDSU but upper division credit allowed; conversely, a sophomore course may be transferred in as a junior level course and upper division credit not allowed. The college does not accept D's transferred from other institutions.

Applicable courses taken in the major subject may be used to fulfill core requirements for Humanities, Social Science, and Natural Science and Mathematics. Applicable courses are those listed in the catalog as meeting the Humanities, Social Science, and Natural Science and Mathematics requirements of the university.

Minimum credits required for a degree is 128 hours in all areas of Arts and Science.

All general university-wide requirements must be met to qualify for the Bachelor of Arts or Bachelor of Science degree in the College of Arts and Science. In addition, the following special requirements have been established:

A. Major Fields

Subject to the approval of the dean and the department concerned, you must select a field of concentration (major) by your junior year. A minor is not required for graduation. It is recommended, however, that persons wishing to teach in secondary schools prepare themselves to meet the teacher certification requirements in one or two related fields.

After the choice of a major has been approved, you should refer to the curriculum concerned and follow that program closely. You should also be fully cognizant of the minimum requirements for the degrees, namely the group requirements in the humanities, social and natural sciences, as well as the 40 hours required in 300 courses or above. The curriculum printed in the catalog at the time you enrolled in college will normally be the curriculum required for graduation. Students transferring from other colleges of the university should complete the curriculum in force at the time of transfer. Note: Under no circumstances will duplicate credit be given for Math 113 and 120 or for Chemistry 100-110 and 112 or for Physics 115-111-113 and 211-213.

B. Quality of Work

Upon the recommendation of the dean and the department administrator, you may be required to change your major if the quality of work is considered unsatisfactory. For purposes of interpreting this regulation, less than a "C" average in courses in the major will be regarded as unsatisfactory.

C. Elective Courses

Elective courses completed in the junior and senior years should normally be selected from those numbered 300 or above.

In the curricula outlined on the following pages there are frequently found statements such as "Elective in Economics" or "Elective in Humanities." Although you may select from a wide range of courses the selected ones must be for as many credits in the field as is indicated.

D. Unpenalized Electives (Pass-Fail System)

If you are following the B.A. and B.S. curricula in the College of Arts and Science you have the option of enrolling in up to 12 credits of unpenalized electives. (See Unpenalized Electives on pages 15, and 36.)

E. Preparation for High School Teaching

If you plan to teach in high school you should start taking professional education courses in the first semester of your junior year if you expect to complete the teacher certification requirements by the time degree requirements are met.

Before being admitted to the education sequence you must apply for admission to the supervisor of student teaching. To be admitted to the education sequence you must have a minimum 2.2 grade-point average as well as meet certain other requirements stipulated by the department. (See Education Division for further details.)

Note: Career opportunity information in these fields may be obtained from the department administrator or the dean.

Education

Darrell Jensen, Dean

Education (Ed)

Division of Education

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

Agriculture, Art, Biology & Botany, Chemistry, Economics, English, Foreign Language — French, German, & Spanish, Geography, Health & Physical Education, 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 Vocational Education and Division of Vocational and Technical Education. The latter office administers vocational education under the provisions of the Vocational Education Amendments of 1976, providing federal aid for such work.

Organization of the Division of Education

The division is headed by a dean who is also the chairperson of the Teacher Education Policy Advisory Committee which assists in advising and coordinating the teacher preparation program. Other members of the committee are the vice president for academic affairs, the dean of the College of Arts and Science, the dean of the College of Agriculture, the dean of the College of Home Economics, the head of Home Economics Education, the head of Health, Physical Education & Recreation, and the supervisor of Agricultural Education.

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 1974. Also the division has been approved by the S.D. Division of Elementary and Secondary Education. (DESE) The last visit of the state agency and the granting of approval occurred during the spring of 1980. The division is accredited by the North Central Association of Colleges and Secondary Schools, the most recent accreditation completed in April 1975.

Objectives

The objectives for the division are to:

1. Prepare you for the teaching profession in secondary schools.
2. Provide for the continuing growth of teachers, school administrators, and other school service personnel through summer school sessions and extension courses.
3. Provide course work at the graduate level especially designed for school administrators, counselors, classroom teachers, specialized school workers, and related occupations.
4. Cooperate with the S.D. Division of Elementary and Secondary Education in public school curriculum revision, in-service education, and educational research.
5. Function as a center of educational research and as a source of information for public schools and agencies of the state.
6. Cooperate with professional education organizations in advancing the welfare of education in the state.
7. Organize and conduct conferences and workshops for the improvement of education in South Dakota.
8. 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 and Quality of Work

Students desiring admission into professional courses in education for the purpose of earning a teaching certificate must file an application in the division upon registration and attendance in their first course in education. A teacher education committee will respond to requests for waiver of admission standards.

Students entering the teacher education program must meet the following qualifications;

1. Minimum all-university GPA of 2.0 for admission to the education curriculum. (Students enrolling in a student teaching course must have an all-university G.P.A. of 2.2).
2. Acceptable college entrance test scores.
3. Recommended by department in which the student is majoring prior to student teaching.

Preparation for Teaching

The candidate should have personal qualities appropriate for the teaching profession. It is also essential that the candidate have an adequate general education background, usually attained in the first two years of college. The candidate should major in the subject he/she expects to teach and should complete the necessary education and psychology courses.

The SD Division of Elementary and Secondary Education (DESE), in issuing the teacher certificates, reviews subject matter background and professional education courses taken by the candidate.

Teaching majors and minors are generally chosen from college majors and minors. The education and psychology courses do not count as a major or minor but are require-

ments 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. Teachers may expect to teach in more than one area of specialization. Their major and minors can serve this purpose. For example, in science they should plan their preparation for all usual subjects in science rather than in just one special science, or in social studies they 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 be prepared for directing one or several extra-class activities.

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

Fields— Prospective teachers prepare themselves in one or more of the fields listed on this page.

You should have completed 24 semester hours of academic preparation to teach in most subject matter areas. The minimum amount of preparation in any particular subject varies from 8 to 12 semester hours, depending upon certification requirements. For example in social studies, the student must have completed 24 semester hours of preparation with a minimum of 8 semester hours in any specific subject taught.

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 to teach Social Studies in the State of South Dakota requires 24 semester hours of credit in the Social Science areas, with at least 8 semester hours in each subject taught.

You must have an emphasis in one or both of the following:

American History — Hist. 241, 252, elective	8
American Government — PolS 100, 102, 210	9

You may then choose the remainder of the 24 semester hours requirement from the following:

American History area or Political Science area shown above	8
Methods of Teaching Social Studies (strongly recommended for teaching minors) SeED 495	2
Economics — Econ 201, 202, elective	8
Geography — Geog 131 or 132, 200, elective	9
Psychology — Electives	8
Sociology — Soc 150, 301 and 310	8
World History — Hist 121, 122, electives	8

Language Arts Minor

Fr & Junior Comp, Engl 100, 101, or 191 & 300	6
English electives	7
Fund of Speech, SpCm 101	3
Speech electives	3
Newswriting & Reporting, J210	3
Journalism elective	2

General Science Minor*

Biology, Bio 151 & Bio elective	3
Intro Physics, Phys 101	4
Gen Chem, Chem 110	4
12 hours electives from Natural Science Core Courses excluding Mathematics	13

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 DESE and the North Central Accrediting Association.

Those planning to teach should consult the dean of the division, division staff members, and advisors in college major and minor

Engineering Curricula

Major & Minor Fields	Options/Areas of Emphasis	Dept. Administering
Agricultural Engineering	Electric Power & Processing Environmental Management Power & Machinery Structures & Environment Water Resources Engineering	Ag Engineering
Civil Engineering	Environmental Sanitary Engr. Highway Engineering Hydraulics Engineering Foundations Engineering Structural Engineering	Civil Engineering
Computer Science		Computer Science
Electrical Engineering	Bioengineering Communications and Advanced Electronics Computers — Data Processing Systems Power Systems Remote Sensing	Electrical Engineering
Engineering Physics		Physics
Mechanical Engineering	Aeronautics Environmental Engineering Heat-Power Engineering Industrial Engineering Machine Design Nuclear Engineering Thermal Engineering	Mechanical Engineering

departments early in the junior year for more detailed interpretations of these regulations.

Teaching Certificates

Teaching certificates in SD are issued by DESE. The secondary certificate qualifies the holder to teach subjects in grades 7-12. The certificate states the subjects or subject groups in which the teacher may teach.

Placement Service

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

Graduate Study in Education

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

(1) Agricultural Education
(2) Educational Administration
(3) Counseling, Guidance and Personnel Services
(4) Teacher Education

For further information consult the graduate bulletin.

For a statement of specific requirements for the different administrator's certificates, the student should write the Division of Elementary and Secondary Education or consult with the dean of the Division of Education.

Education Curriculum for Teachers of Academic Subjects

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
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
Senior Year	**F**		**S**
First Half of Semester:			
Ed Measurements, EdER 415	2	or	2
Methods of Teaching in Sec Schools, SeEd 400	3	or	3
Prin of Guidance, CGPS 410	2	or	2
Audio Visual Methods & Materials, SeEd 405	2	or	2
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

Junis O. Storry, Dean

Four-year curricula leading to the Bachelor of Science degree are offered in: **Agricultural Engineering, Civil Engineering, Electrical Engineering, Engineering Physics, Mechanical Engineering.**

The first semester is the same for all curricula, and is concerned primarily with fundamental courses common to all branches of engineering. Actually, you can use the first year to learn something about various fields of engineering by counsel, observation, and experience.

You will have an adviser from one of the engineering departments who will assist in planning course work, and who will cooperate in the general university counseling and orientation program.

The second semester and the second year contain many fundamental courses common to all engineering, but a few special courses are introduced. It is desirable that you select a curriculum when enrolling for the second semester although it is possible to select or change a curriculum during or at the end of the second year without causing serious inconvenience.

During the last two years, special courses offer opportunities for you to (1) acquire an understanding of fundamental principles, and (2) become familiar with the applications of these principles to practical problems in your chosen field. Problem work and laboratory work are essential features of such courses.

Each curriculum devotes considerable time to communications skills, humanities, and social sciences which should broaden your interests and background and so prepare you for working with people as well as machines.

Inspection trips are arranged to acquaint you with current practice.

If you wish to complete one of these curricula in four years (eight semesters) you should present high school credits for 3½ years of mathematics including two years of algebra, one year of geometry, and one-half year of trigonometry. If you have not had the second year of algebra or trigonometry you may still enroll in engineering, but you should realize that it will undoubtedly take more than eight semesters to complete the program for the B.S. degree. If you have mathematics deficiencies you are urged to attend summer school before enrolling in the fall semester of your freshman year, or you may attend late summer school sessions if you intend to graduate within a normal four year period.

Other Programs

The College of Engineering is in an ideal position to offer a pre-architectural program for students who have interests in architecture. Architects must have knowledge of building design, materials, structural elements, mechanical and electrical equipment, acoustics, and illumination. These areas are all covered in the fields of Civil, Electrical, and Mechanical Engineering.

The engineering staff is therefore well qualified to serve as advisers for architectural students. Staff members are familiar with architectural programs that are offered at other schools and some have had close association with architects or architectural firms. The first and second year architecture curriculums can be very similar to the engineers' curriculums.

Advisers will help you plan sequences of courses which will prepare you for transfer to any specific college of architecture or a general, broader, program of study can be arranged that will allow transfer to any college.

Cooperative Education/Internship/ Field Experience in Engineering

This program provides you with an opportunity to integrate classroom study with planned and supervised professional work experience which takes place outside of the formal classroom and is related to your field of study. The experience usually takes place off campus and is provided through periods of employment with cooperating business, industrial, educational and governmental agencies.

Academic credit for participation in this program is available through a 494 course offered in each engineering department. You may enroll for 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.

Participation in this program will significantly contribute to your education and professional development.

Activities

Engineering students are encouraged to participate in activities of the following student chapters of national professional engineering socieites: ASAE, ASCE, ASME, IEEE, SEP. Physics Engineering students are also invited to join the Mathematics Club and the Society of American Military Engineers. Outstanding students are invited to join local chapters of the national engineering honor societies: Alpha Epsilon, Chi Epsilon, Eta Kappa Nu, Pi Tau Sigma, Sigma Pi Sigma, Tau Beta Pi; and the university national honor societies, Phi Kappa Phi.

Approved Humanities and Social Science Electives

Engineering students must satisfy all core requirements. You are urged especially to note the requirements for Humanities and Social Sciences and the approved lists of courses. Refer to the section on Academic requirements in this catalog for details.

General Registration

Arnold J. Menning, Dean

Students enrolling in the College of General Registration have elected to explore their abilities, interests and educational alternatives before declaring a major. More than 200 majors, minors and options are available and assistance is provided in making a choice of major and career. Undeclared majors, pre-professional students and those who simply want to take a variety of courses constitute the bulk of the enrollment in General Registration.

No-Preference

The college allows you to begin General Registration 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. Courses of study are scheduled according to the results of adviser planning and evaluation sessions. Emphasis is also directed toward enabling you to develop skills to explore career areas and arrive at a major choice.

You may review the proposed freshman year schedules 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 courses taken under the elective portion of the program. Many general registration students indicate their interests in the form of a choice between social science-oriented programs and science-oriented programs.

Undecided students enrolled in general registration should maintain at least a "C" grade average in freshman and sophomore subjects. This is important in gaining admittance to one of the other colleges. Students are permitted to enroll in the College of General Registration for two academic years.

Suggested Program No-Preference
Social Science Oriented
Freshman Year

Fr Comp, Engl 101, 191 or Fund of Speech, SpCm 101	6
Biological or Physical Science	6-8
Social Sciences	6
Fitness & Lifetime Activities PE 100	2
Career Exploration and Interest Areas	8-12

Suggested Program No-Preference
Science Oriented
Freshman Year

Fr Comp, Eng 101 or 191 and Fund of Speech, SpCm 101	6
Mathematics, Math 113, Algebra & Trigonometry, or Math 123, Mathematical Analysis I	5
Fitness & Lifetime Activities, PE 100	2
Chemistry, 112-114	8
Career Exploration & Interest Areas	6-8

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 register in the College of General Registration. Several hundred pre-professional students are enrolled in General Registration, and numerous students enrolled in other colleges of the university 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 a number of 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 General Registration dean's office.

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. The chiropractor cannot function in an academic microcosm, and through training, must learn to successfully handle interpersonal relations.

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 or 191 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
Sophomore 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

*Two semesters of organic chemistry will be required for admission to chiropractic colleges after fall 1981.

Complete 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 if admitted before fall 1981. 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 office of the dean of General Registration. 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 college 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, 191 or Fund of Speech, SpCm 101	3	or	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	or	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 entering into law school 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 to prepare for entry into 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, the new 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 utilize 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 senior year as an undergraduate. 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 catalogs.

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. Students seeking to enter the medical field should, during high school, take the basic sciences offered to meet the requirements for admission to an accredited college. Although most medical schools require a minimum of three years of college study, today most students admitted to medical school either have a bachelor's degree or are within a few hours of securing that 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 interest-

ed 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. The number of SDSU students who have been successful in gaining admission to medical schools have been twice as good as the national average in recent years.

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, 191 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
Embryology, Zool 383	4		
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; 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 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.

Freshman year	**F**		**S**
Fr Comp, Engl 101, 191 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

Students planning to attend SDSU for the sophomore year should carefully consult the catalog of the mortuary school to which they intend to transfer. Listed below is a suggested program for the sophomore year.

Sophomore Year	**F**	**S**
Accounting, Actg 210-211 Prin of Actg I & II	3	3
Math, Math 111, Algebra, or Math 113, Algebra & 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.

SDSU students are most frequently admitted to optometry schools in Illinois, California or Oregon. 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, 191 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
Physiological Psychology, Psych 311	3	

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

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

General Personal Studies

A number of General Personal Studies Programs may be arranged if you wish only one or two years of basic college education. Major emphasis for the programs is usually in communications, sciences or social studies. A combination of subject matter courses from these general education fields can be arranged, based on interest and probable need. Because of the variety of combinations available these are not outlined in detail. A student classified in General Personal Studies would not be required to meet specific university curriculum requirements. Should you later decide to enroll in a degree program at the university, you would then plan the remaining program of study to meet the degree and other university course requirements. Persons seeking additional information regarding General Personal Studies opportunities should consult with the dean of General Registration in Room 318, Administration Building.

Home Economics

Ardyce Gilbert, Dean

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

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

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

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

Department of Child Development and Family Relations

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

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

Department of Home Economics Education

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

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

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

Home Economics Journalism is for the student who is interested in journalism positions with newspapers, magazines, radio, television and other organizations which require persons with a combined knowledge of journalism and home economics.

Department of Nutrition and Food Science

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

Graduates may qualify as a Registered Dietitian through the 1) coordinated undergraduate program or the 2) 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

The Department of Textiles, Clothing and Interior Design offer curricula for those interested in careers in business and industries involving Textiles and Clothing or Interior Design.

Internships or professional practicum provide experiences in the business world, and prepares graduates as department buyers and managers or as independent business operators.

The major in Textiles and Clothing includes two options: 1) Apparel Design and 2) Retailing.

Curriculum

Those enrolled in Home Economics will complete the University core curriculum requirements, i.e. English Composition, 6 cr; Speech, 3 cr.; Social Science, 9 cr.; Humanities, 6 cr.; Mathematics, 3 cr.; Natural Science, 8 cr.; and Physical Education, 2 cr.

In addition, you will take courses designed to provide a perspective of the interdependence of the areas which directly influence

Home Economics Curricula

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

the family, i.e. family development, nutrition, housing, clothing and managing family resources.

Credits to complete the 128 credits required for graduation in each professional option are specified by the department administering the program.

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
NFS 111 Food and Man
NFS 171 Introduction to Hospitality Industry
TCID 171 Clothing Selection
TCID 221 Introduction to Interior Design

Undergraduate Honors Program

Second semester freshmen of unusual scholastic ability who wish to prepare for graduate study in their area of interest may plan, with the staff, a specialized program of undergraduate study leading to a Bachelor of Science degree.

Graduate Program in Home Economics

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

Nursing

Carol J. Peterson, Dean

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

1. Provide opportunities for selected men and women: a. to obtain baccalaureate education in the profession of nursing; b. to obtain baccalaureate education in the profession of health science in the areas of public health administration, sanitation, environmental health, and health education; c. to learn about health and health care while pursuing other majors in the University.
2. Offer undergraduate curricula which provide sound foundations for further study in advanced education.
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.
6. Provide expertise (knowledge and skill) to the state in an effort to solve problems related to health, health care, and general well being via
   a. participation in voluntary and professional organizations.
   b. consultation to individuals, agencies, and/or institutions.
   c. direct problem solving.
   d. participation in or conduct of research.
   e. continuing education programs.
7. Provide graduate education in nursing.
8. Encourage and facilitate research in nursing, health care, and preventative health.

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

Department of Nursing

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

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

Department of Health Science

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

Department of Continuing Education

The Department of Continuing Education in cooperation with other departments of the university and groups in the state offers courses and workshops for nurses and personnel in health-related disciplines.

Continuing education is organized within the College of Nursing to provide state-wide services to health personnel by offering off-campus and on-campus credit and non-credit courses in response to requests. Academic standards and policies governing off-campus credit courses are identical to the on-campus instructional programs. Classes meet the same number of hours as on-campus. A minimum enrollment of fifteen students per credit course is required to cover expenses of instruction.

A nurse resource library is a "library-by-mail" system for R.N.s and L.P.N.s, offering a selection of books and independent study packets.

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

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

Pharmacy

Raymond E. Hopponen, Dean

As one of the health professions, pharmacy is vitally concerned with public health and safety. Specifically, it is concerned with all activities associated with preparation, distribution and control of drugs and medicines. The aim of the College of Pharmacy is to qualify its graduates to assume their professional responsibilities as members of the profession most directly concerned with these activities. As society grows more complex, problems of providing proper medical services also grow more complex. This requires that pharmacy students must not only be provided with sound scientific and professional training but also be given opportunity to gain as much liberal education as possible to better understand the society which they serve.

The College of Pharmacy offers a five-year plan of study leading to the degree of Bachelor of Science in Pharmacy. The plan of study is designed to prepare you for the professional practice of pharmacy. In addition, by proper selection of elective courses you may also prepare for graduate study in pharmacy, pharmaceutical chemistry, pharmacognosy or pharmacology. Those considering graduate study should consult their adviser about elective choices. You may be allowed to substitute course work preparatory to graduate study for some required economics courses. Those interested in the retail or commercial fields of pharmacy may also better prepare themselves by electing additional work in business administration.

Graduates of the College of Pharmacy are eligible to apply for licensing in any state. In general, licensing as a pharmacist requires graduation from an accredited College of Pharmacy, a certified period of supervised experience and successful completion of a series of examinations administered by the Board of Pharmacy of the individual state. These requirements vary slightly from state to state. Students interested in practicing in a particular state should contact the Board of Pharmacy of that state for information concerning requirements.

The College is accredited by the American Council on Pharmaceutical Education.

Graduate Study

Pharmacy offers many challenging and rewarding careers which require additional study at the graduate level. Students who might be interested in teaching or research should discuss their plans with an adviser.

Professional Organizations

Membership in the student branch of the American Pharmaceutical Association is open to all students in the college. Purpose of the organization is to give you a better appreciation of the scope and aims of your profession. It also provides an opportunity to develop leadership potential and to meet with other pharmacy students.

College of Pharmacy Regulations

Students in the College of Pharmacy are governed in large measure by the regulations which apply to all students at SDSU. Therefore, you should be familiar with material in the general information section of the catalog. In addition to the all-university rules and regulations, the College of Pharmacy has some requirements specifically for pharmacy students.

Overall university requirements for graduation stipulate that you obtain an average of two grade points for each credit hour passed. In addition, you must earn at least two grade points for each credit hour in College of Pharmacy courses. In order to keep students who may be having academic difficulties aware of their situation, the college has instituted a set of "pharmacy probationary" standards. You will be placed on "pharmacy probation" whenever your cumulative average in pharmacy courses drops below 2.0. You will remain on "pharmacy probation" as long as the cumulative average in pharmacy courses remains below 2.0. If the semester grade point average of a pharmacy student on such probation drops below 2.0 he/she will be placed on refused status from the College of Pharmacy, you may not graduate while on pharmacy probation. It should be noted that this procedure applies only to pharmacy subjects and does not affect your standing in the university which is still governed by all-university regulations. A minimum of 164 credit hours of acceptable course work must be presented for graduation. You may transfer a maximum of six (6) credits of pharmacy prefixed courses from another college of Pharmacy on approval of the Dean. Exceptions must be approved by the faculty.

Curriculum

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

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

You must ordinarily expect to spend four years in residence in order to complete the professional portion of the curriculum. Variations from the pattern may be permitted by faculty action. The first year (pre-professional portion of the curriculum) may be completed at any recognized junior college or four year college. Course work should be selected carefully to ensure that it will apply toward graduation from the College of Pharmacy. All students seeking admission to the second year must have completed Chemistry 112, Mathematics 113, and Biology 151 or their equivalents and possess an overall gradepoint average of at least 2.0. Completion of the Pharmacy College Admission Test is also required of all candidates for the second year class. Details are available from the college office.

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.

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 211-221 and 313.

4th year standing — completion of, Pharmacy 312, 314, 323, 332, 411, 421 and Zoology 325;

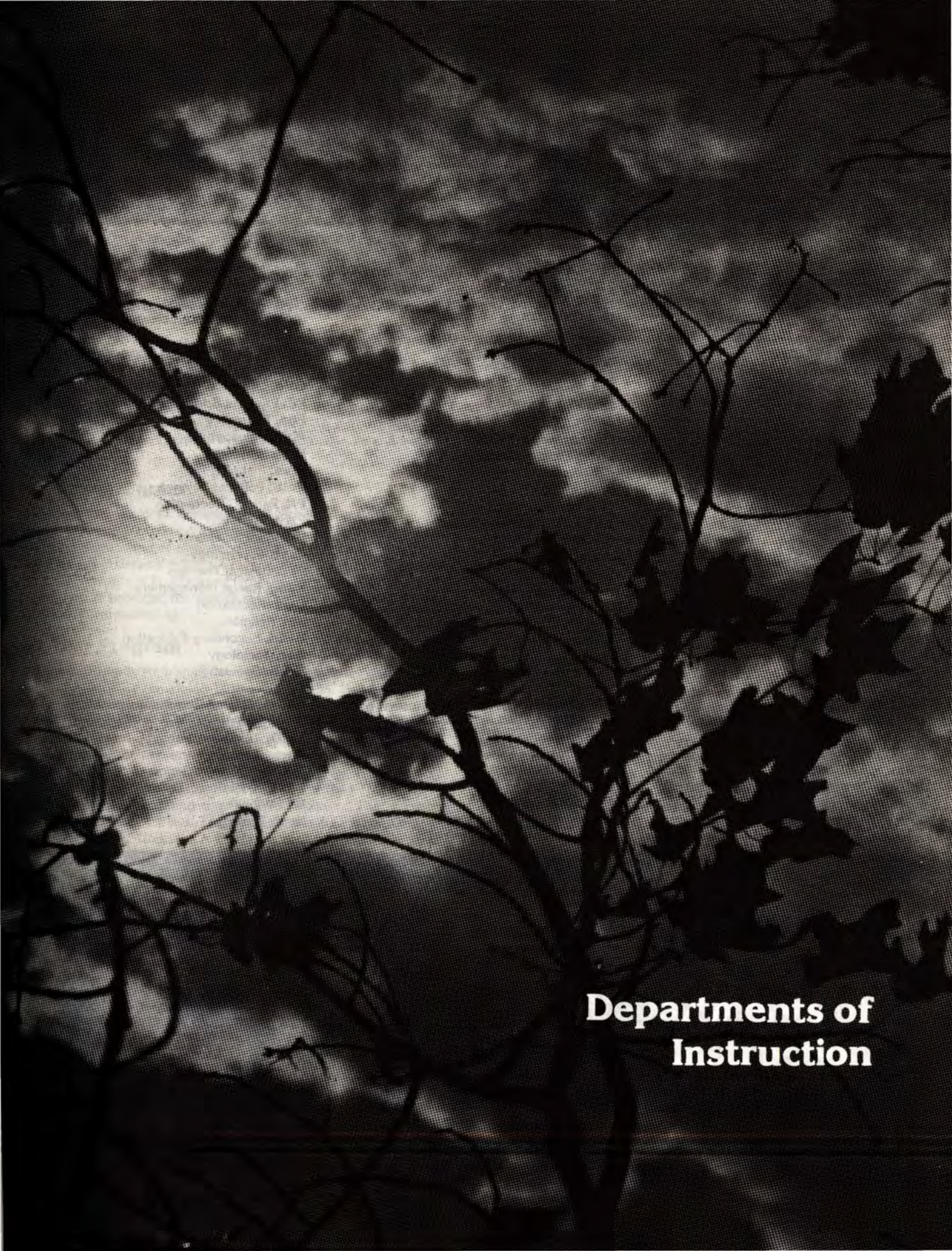
5th year standing — completion of Pharmacy 412, 422, 542, 543, 546, and 552.

Curriculum in Pharmacy

First Year	F	S
Fitness and Lifetime Activities, PE 100	1	1
Fr Comp, Engl 101 or 191	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		4
Pharmaceutical Calculations, Pha 313		1
†Electives	4	
Third Year	**F**	**S**
Pharmacy II, Pha 312	4	
Pharmaceutical Biochem, Pha 323	5	
Pharmacognosy I-II, Pha 331-332	3	4
Inorganic Medicinals, Pha 222	3	
Interpersonal Communications, SpCM 201	3	
Organic Medicinals, Pha 421		4
Biopharmaceutics and Pharmacokinetics, Pha 411		4
Mammalian Physiology, Zool 325		4
Pharmaceutical Jurisprudence, Pha 314		3
Fourth Year	**F**	**S**
Organic Medicinals, Pha 422	4	
Pharmacology I-II, Pha 541-542	5	4
Junior Comp, Engl 300	3	
Prescription Practice, Pha 412		5
Drug Therapy, Pha 545-546	3	3
Toxicology, Pha 543		2
Pharmacy Management, Pha 552	3	
Pharmacy elective		3
Fifth Year	**F**	**S**
Public Health Science, HSc 443	3	
OTC Products, Pha 517	2	
Pharmacy elective	3	
†Electives	6	
Externship, Pha 515		6
Clinical Pharmacy, Pha 513		6

*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 of six hours of humanities and nine hours of social sciences.



Departments of Instruction

Departments of Instruction

Colleges, Departmental and Program Abbreviations

Actg, Accounting
AE, Agricultural Engineering
AgEc, Agricultural Economics
AgEd, Agricultural Education
AHEd, Adult Higher Education
Air, Aerospace Studies
Anth, Anthropology
ArtD, Art Design
ArtE, Art Education
ArtH, Art History
ArtS, Art Studio
AS, Animal Science
AV, Audio-Visual
Avia, Aviation
BAd, Business Administration
Bio, Biology
Bot, Botany
CAI, Computer Assisted Instruction
CDFR, Child Development and Family Relations
CE, Civil Engineering
CGPS, Counseling, Guidance & Personnel Services
Chem, Chemistry
Conc, Concurrent
CSc, Computer Science
Danc, Dance
DCom, Communication Disorders
DrEd, Driver Education
DS, Dairy Science
EBio, Bio Engineering
ECom, Communications Engineering
Econ, Economics
EdAd, Educational Administration
EdER, Education Evaluation & Research
EdFn, Educational Foundations
EE, Electrical Engineering
EG, Engineering Graphics
Elec, Electronics
ElEd, Elementary Education
EM, Engineering Mechanics
Engl, English
Ent, Entomology
EPow, Power Systems
EPsyc, Educational Psychology
ES, Engineering Shop
EurS, European Studies
F, Forestry
Fren, French
FL, Foreign Languages
GCom, General Communication
GE, General Engineering
Geog, Geography
Germ, German
HE, Home Economics
HEd, Home Economics Education
Hist, History
Hlth, Health
Ho, Horticulture
HPER, Health, Physical Education & Recreation
HSc, Health Science
Hum, Humanities
J, Journalism
La, Landscape Design
Ling, Linguistics
MA, Mechanized Agriculture
Math, Mathematics
MCom, Mass Communication
ME, Mechanical Engineering
Micr. Microbiology
Mil, Military Science
MuAp, Music Applied
MuEn, Music Ensembles
Mus, Music
NFS, Nutrition & Food Science
Nurs, Nursing
OEd, Office Education
PE, Physical Education
Pha, Pharmacy
Phil, Philosophy
Phys, Physics
Plan, Planning
PolS, Political Science
PR, Parks & Recreation
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 Educatic
WL, Wildlife
Zool, Zoology

Aerospace Studies (Air)

College of Arts and Science

Colonel Lehman, Professor of Aerospace Studies, head; Assistant Professors Major Auer, Major Neumann; Captain Berquist, Captain Johnson; Instructors SMSgt Ahartz; SSgt. Dupre, SSgt. Fenken

General

The Air Force Reserve Officer's Training Corps (AFROTC) program is conducted by the Department of Aerospace Studies. The purpose of this program is to enable qualified undergraduate and graduate students to become commissioned officers in the US Air Force. The learning experiences received will be of long range value in either a military or civilian career. Upon graduation and completion of the AFROTC curriculum the student is commissioned a second Lieutenant and will:

1. Enter the Air Force and complete the designated technical training course for your job specialty,
2. Receive a delay from active duty for pursuing an advanced degree at your own expense, or
3. Be selected for one of the Air Force sponsored graduate study programs while serving with full pay as an Air Force officer.

The following two programs are open to qualified male and female full-time students.

Four Year Program

Designed for students completing a four-year college degree; however, it is easily modified to accommodate students with 3 to 5 years of academic studies remaining before graduation. Consists of: four semesters of General Military Courses, a four week Field Training Unit, four semesters of Professional Officer Courses. A Flight Instruction program is provided for cadets selected for pilot training after graduation/commissioning.

Two Year Program

Designed primarily for transfer and graduate students with 2 years of academic studies remaining before graduation. However, other students who did not participate in Air Force ROTC during Freshman and Sophomore years may also participate. The two-year student must contact the Aerospace Studies Department no later than the Spring Semester before entering the program to allow time for selection, medical examination and scheduling for field training during the summer. Successful completion of the Field Training Unit is mandatory before entering the two-year program. The program consists of: six week Field Training session, four semesters of Professional Officer Courses. A Flight Instruction Program (FIP) is provided for senior year cadets selected for pilot training after graduation/commissioning.

Aerospace Studies Minor

Those completing the four year program are qualified for an Aerospace Studies minor.

Veterans/National Guard Members

Students with prior military training or service are evaluated by the Professor of Aerospace Studies for advance placement in the four-year program. In some cases, completion of the general military courses and field training are not prerequisites for entrance into Professional Officer Courses. Veterans are eligible for AFROTC Scholarships and AFTOTC subsistence payments in addition to Veterans' Educational Benefits.

Financial Assistance

• SCHOLARSHIPS. Qualified students can compete for 4-year, 3½ year, 3 year, 2½ year and 2-year scholarships, which cover full tuition, books, laboratory expenses, incidental fees and $100 per month tax free subsistence allowance. Scholarship competitions are also held at intermediate times to fill vacancies in the nationwide scholarship program. Awards are based upon officer potential. Applicants are nominated on the basis of: Air Force Officer Qualifying Test Scores, ACT or SAT college aptitude scores, academic major and grade point average, personal evaluation by the Professor of Aerospace studies.

Final selection is made by Air Force ROTC Headquarters.

NOTE: High school students should contact their high school counselor for application forms, to be completed following the junior year or early in the fall of the senior year. If your counselor does not have the forms, contact AFROTC Det 780, SDSU, Brookings, S.D. 57007.

- Air Force ROTC courses are tuition free.
- Military uniforms, textbooks and equipment are furnished.
- Cadets enrolled in the Professional Officer Course received the same $100 per month tax free subsistence allowance that scholarship students receive.
- Qualified cadets selected for pilot training receive flight ground school and up to 25 hours of flight training during the senior year.

The Air Force ROTC Curriculum

THE GENERAL MILITARY COURSE (GMC). The first two years of Air Force ROTC are general survey courses open to all. The courses provide an orientation to the history, organization and career opportunities of the USAF. This, in turn, provides the student with an orientation to an Air Force career without incurring a military service obligation.

During the last semester, qualified students interested in an Air Force Commission complete applications for the Professional Officer Corps and are scheduled for field training.

Students also participate in leadership laboratories while in general military courses.

FIELD TRAINING. Summer Field Training Units (FTUs) are conducted at operational Air Force bases and give the cadets an in-depth look at Air Force life and activities without incurring a military service commitment. It also gives the Air Force ROTC instructors a look at the students outside the university environment before they are accepted in the Professional Officer Course. Both the 4-week and the 6-week FTU include cadet orientation, junior officer training, survival training indoctrination, aircraft and aircrew indoctrination (including a 30 minute ride in a jet trainer), physical conditioning, career orientation, small arms familiarization, and a look at the organization and functions of an Air Force base. At the 6-week FTU, the additional two weeks are mainly used to complete the course material and leadership laboratory training missed by not participating in the General Military Courses on campus. Students are provided an airline ticket or paid 18.5 cents a mile for driving. At camp they receive free room, food, medical care, and $13.98 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 officer. The curriculum of the Professional Officer Corps has been designed to acquaint the cadet with military management concepts and the relationship of the Air Force to American society. Cadets practice management concepts as cadet officers in the cadet corps.

PROFESSIONAL OFFICER CORPS SELECTION CRITERIA. Have four full time semester remaining; complete the general military course or its equivalent; successfully complete field training; meet academic standards; choose one of the available career categories; qualify on the Air Force Officer Qualifying Test and the ACT or SAT college aptitude test; qualify on the Air Force medical evaluation; be of sound moral character.

FLIGHT INSTRUCTION PROGRAM. Qualified Professional Officer Course cadets interested in becoming Air Force pilots (and selected as pilot candidates) participate in the Flight Instruction Program. Each potential pilot receives up to 25 flying hours at the Brookings airport and flight ground instruction from a rated Air Force pilot at the Aerospace Studies Department. This completes a substantial part of the training needed for a cadet to pass the Federal Aviation Agency (FAA) examinations and receive a private pilots certificate. This training is provided during the last academic year before graduation and commissioning.

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) F
Air power from balloons and dirigibles through 1947; Air Force mission, concepts, doctrine and use of air power.

102 Aerospace Studies 100 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.

201 Aerospace Studies 200 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.

202 Aerospace Studies 200 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.

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 Moe, head; Professors Chu, Deboer, Hellickson, Myers, Wiersma, Professor Emeritus Delong; Associate Professors Durland, Lubinus, Lytle, Schmer, Ullery; Assistant Professors Alcock, Christianson, Julson, Pahl, Schipull; Instructors Bender, Cleuver, Kelley, Stange.

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 area: irrigation, drainage, water resources development, machine dynamics and design, agricultural power, electrical power utilization, processing of biological materials, environmental control for livestock, control and disposal of agricultural wastes, agricultural structures, and instrumentation. Courses are also offered in the fields of meteorology, climatology, and micro-climatology to engineers and students in other colleges who are interested.

To earn the Bachelor of Science Degree in Agricultural Engineering a student must have an average grade of C or better in courses taken and required in the Agricultural Engineering Department.

Cooperative Education and Industry Cooperative Programs are available in the department. Arrangements may be made for some credit under Course No. 494, Engineering Cooperative Internship.

For mechanized agriculture courses and curriculum as offered by the Agricultural Engineering Department, see Mechanized Agriculture for full description. For Master of Science work, see the Graduate Bulletin. Graduate level courses will be taught as listed and on demand.

Curriculum in Agricultural Engineering

(Accredited by the Accreditation Board for Engineering and Technology)

128 semester credits required for the Bachelor of Science degree

Freshman Year	**F**	**S**
Mathematical Analysis I-II, Math 123-124	5	4
Gen Chem, Chem 110 or 112	4	
Elementary Organic Chem, Chem 120 or Chem 114	3	
Fr Comp, Engl 101 or SpCm 101	3	3
Engineering Design Graphics I-II, EG 121-122	2	2
Fitness & Lifetime Activities, PE 100	1	1
Engineering Orientation, GE 110	0	
Statics, EM 221		3
†Non-technical electives	1	1
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	
Computer Programming, CSc 312	2	
Dynamics, EM 222		3
Differential Equations, Math 321		3
Intro to Literature, Engl 218		3
†Non-technical electives	3	3

Junior Year	F	S
Mechanics of Materials, EM 321	3	
Thermodynamics, ME 314	3	
Ag Structures, AE 324	4	
Macroeconomics Principles Econ 201		3
Electric Circuits & Equipment, EE 305		3
Junior Comp, Engl 300	3	
Fluid Mechanics, EM 331		3
Ag Power & Machines, AE 314	4	
†Technical electives		3
†Non-technical electives		3

Senior Year	F	S
Electric Power & Processing, AE 444		4
Soil & Water Engineering, AE 434	4	
Applied Instrumentation, AE 462	2	
Seminar & Inspection Trip, AE 471	1	
Ag Engineering Concepts & Design, AE 464		4
Electives	2	2
World Crop and Soil Resources, PS 433	3	
†Technical electives	3	3
†Non-technical electives		2

†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 planned with his/her advisor, and approved by the head of the Agricultural Engineering Department. 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.

Suggested Technical Electives:

Suggested electives in all options. Physical Climatology & Meteorology, AE 353; Special Topics, AE 470; Special Problems in AE, AE 490; Cooperative Education/Internship/Field Experience, AE 494; all 500 level courses listed in Agricultural Engineering; Statistics 341 or Math 381, Advanced Engr. Math, Math 331; Computer Operation, CSc 314; Computer Languages, CSc 316; Special Topics in Computer Science, CSc 391; Microcomputer Applications, ECom 425; Computer Architecture & Organization, ECom 426; Engineering Economy, GE 422*; Biology, Biol 153; Soils, PS 113 or Soils Engineering, CE 446.

Structures & Environment	Credits
Steel Design, CE 455	3
Concrete Theory & Design, CE 456	3
Industrial Engineering, ME 362	3
Engineering Administration*, CE 475	3
Heating, Ventilating & Air Conditioning, ME 411	3
Heat Transfer, ME 415	3
Structural Theory, CE 353	3
Soils Engineering, CE 446	4
General Microbiology, Micr 231	4

*Technical elective credit not given for both CE 475 & GE 422.

Power and Machinery	Credits
Mechanisms, ME 321	3
Vibrations, ME 322	3
Metallurgy, ME 341	3
Industrial Engr., ME 362	3
Internal Combustion Engines, ME 412	3
Heat Transfer, ME 415	3
Design of Machine Elements, ME 421	4
Machine Design, ME 428	2
Applied Stress Analysis in Mechanical Design, ME 522	3
Physical Environment of Soils & Plants, PS 352	2

Electric Power & Processing	Credits
Industrial Engineering, ME 362	3
Heating, Ventilating & Air Conditioning, ME 411	3
Heat Transfer, ME 415	3
Heating, Ventilating & Air Conditioning II: Design, ME 419	3
Automatic Controls, ME 451	3
General Microbiology, Micr 231	4
Electronics I, Elec 320	4
Electromagnetic Field Theory I, EE 385	3
Energy Conversion, EPow 430	4

Water Resources Engineering	Credits
Physical Environment of Soils & Plants, PS 352	2
Irrigation — Crop & Soil Practices, PS 483	3
Hydrology, CE 333	2
Water Supply Engr., CE 327	4
Hydraulic Engineering, CE 433	3
Soils Engineering, CE 446	4
Soils, PS 113	3

Environmental Management	Credits
Water Supply Engineering, CE 327	4
Environmental Engineering, CE 523	3
Agricultural Waste Management, MA 463	3
Environmental Chem, Chem 380	4
Environmental Biology, Biol 211	3
General Microbiology, Micr 231	3
Environmental Microbiology, Micr 310	4
Environmental Conservation, WL 210	2

Undergraduate Courses

202 Creative Design in Ag Engineering 2(1,3) F
Analysis of farm machine mechanisms, forces and action, design, development and field testing. 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
Materials and applications; layout of production facilities; heat and moisture production in farm buildings; functional and environmental requirements for livestock and crop production structures and equipment; farmstead water supply and agricultural water disposal. P, ME 314 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.

434 Soil & Water Engineering 4(3,3) F
Precipitation, infiltration, evapotranspiration and runoff from small agricultural watersheds and application to design of conservation structure, water and wind erosion control practices. Design of drainage and irrigation systems. Feedlot pollution control principles. P, EM 331.

444 Electric Power & Processing 4(3,2) S
Application of electrical power to agricultural uses. Principles and applications of processing and handling agricultural crops. Design of agricultural processing and materials handling equipment facilities and systems. P, EE 305 or concurrent.

462 Applied Instrumentation 2(1,2) 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. P, EE 305

464 Ag Engineering Concepts & Design 4(2,4) S
Procedures, theory, concepts and design of soil and water conservation structures, agricultural structures, equipment, machines and systems.

470 Special Topics 1-4(1-4,0-2)
(On demand.) Individual or group study. P, consent.

471 Seminar & Inspection Trip 1(1,0) F
Review of current technical literature in agricultural engineering. Oral and written reports and discussion. P, senior standing.

490 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.

494 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) F
(Offered in 1982) 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. Alternate years.

512-612 Advanced Agricultural Tractors & Machines 2(2,0) F
(Offered in 1982) 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. Alternate years.

522-622 Bio-environmental Engineering 2(2,0) F
(Offered in 1983) 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. Alternate years.

533-633 Advanced Irrigation Engineering 3(2,3) F
(Offered in 1982) Basic soil-water crop relationships. Theory and design of pumping plants, surface, sprinkler and drip irrigation systems. P, 434 or consent. Alternate Years.

542-642 Engineering Phases of Crop Processing 2(2,0) F
(Offered in 1982) Physical properties of agricultural crops and engineering principles as they apply to cutting, shearing, collecting, packaging, transporting, drying, handling and storing agricultural products. Alternate years.

552-652 Theoretical Micro-Climatology 2(2,0) S
(Offered in 1982) Derivation and application of physical laws to air layer near the ground occupied by plants and animals. Instruments used to take measurements in layer near the ground. P, Calculus, Physics 353. Alternate years.

563-663 Instrumentation 3(2,3) S1982
Principles of transducers, amplifiers and terminating devices in measurement systems with emphasis on transducers and systems performance. Techniques and methods for use in engineering and scientific measurement. P, Phy 213, Math 225.

573-673 Programming Agricultural Systems 3(2,2) S1982
Basic FORTRAN programming. Application of computer to solve problems in agricultural engineering, gathering, processing, evaluating engineering and scientific data. P, CSc 312 or consent of instructor. Alternate years.

695 Special Topics on Demand
732 Advanced Hydrology in Agriculture 2(2,0) 1983
733 Ground Water Engineering In Ag 3(3,0) F1983
770 Special Problems in Ag Engineering (1-2 on demand)
771 Graduate Seminar 1(1,0) F1982, 1983
772 Similitude 2(1,2) S1983
790 Thesis

Agricultural Extension (AgExt)

College of Agriculture and Biological Sciences

Agricultural Extension

Frank J. Heitland Extension Program & Staff Development Coordinator

The Cooperative Extension Service is the off-campus teaching 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 county extension agents, county home economists 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 County 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	Credit S
Fr. Comp., Engl. 100, 101 or 191	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	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	3-4	
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, Ent 293 or Insect Control Meth, Ent 391 or Hort Insects, Ent 295		3
Practical Range Mgt., Rang 200	3	
General Elective (See suggested list)	3	
	16	16

Junior Year	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 & Machinery, MA 213	3	
Genetics, Bio 371	3	
Farm & Ranch Mgt — Ag Econ 271	4	
Seminar, Ag Ed 301	1	
General Electives (See suggested list)	7	
Field Practice in Ext., AHEd 400 (Preferred summer between junior and senior year)		(2-5
	16	16

Senior Year	F	Credi S
Animal Diseases and Their Control, Vet 403	3	
Humanities Elective*	3	
Swine Production, AS 478, or Sheep & Wool Production, AS 477		
Beef Production, AS 474		
Feed Technology, AS 333		
Publicity Methods, MCom 313		
Leadership & Group Organization, Soc 533		

General Electives (See suggested list)		12
	—	—
	16	16

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

Electives for Extension Education majors should be selected from the following courses: (Those with asterisks should be given priority consideration.) To broaden the student's scope and knowledge consideration should be given to selecting at least one elective course from each of the Extension program and general categories listed below.

Agriculture:
- **Livestock Evaluation, AS 212 2
- **Principles of Plant Pathology II, PS 333 3
- **Irrigation — Crop and Soil Practices, PS 483 3
- Farm Building Mechanization, MA 423 3
- AG Waste Management, MA 463 3
- Anatomy & Physiology of Livestock, Vet 223 4
- Vegetable Growing, HO 212 3
- Landscape Design I, LA 321 3

Natural Resources:
- Wildlife & Fisheries on Farms and Ranches, WL 212 2
- Principles of Ecology, Bio 211 3
- World Crop & Soil Resources, PS 433 3
- Energy & Agricultural Technology, MA 492 3

Community Development:
- Rural Sociology, Soc 240 2
- Population Problems, Soc 362 3
- General Anthropology, Anth 200 3
- Public Finance, Econ 433 3
- Comparative Economic Systems, Econ 405 3
- Agricultural Policy, Ag Ec 479 3
- Rural Community Planning, Soc 540 3

Youth Development:
- Social Problems, Soc 150 2
- Recreation Leadership, Recr 360 2
- Management in Family & Personal Living, HE 241 2

Communication and Leadership Skills:
- **Public Speaking, SpCm 315 3
- Discussion, SpCm 334 2
- Parliamentary Procedure, SpCm 335 2
- **Broadcast Programming, MCom 335 3
- Public Administration, PolS 320 3

Other: (Applicable to all Extension programs)
- **Principles of Economics II, Econ 202 3
- **Marketing, Econ 353 3
- **Indians of North American, Anth 421 3
- **Statistical Methods, Stat 341 3

Agricultural Journalism

(See Department of Journalism)

Animal Science (AS) and Range Science (Rang)

College of Agriculture and Biological Sciences

Professor Romans, head; Professors Carlson, Dinkel, Embry, Gartner, Granholm, Kamstra, Kohler, Luther, Minyard, Slyter, Wahlstrom; Associate Professors Bailey, Bush, Costello, Gee, Johnson, Kortan, Lewis, Libal, McCarty, McCone, Miller, Plumart, Assistant Professor Bruce, Engle; Instructor, Thompson

The department offers instruction leading to the Bachelor of Science degree with majors in Animal Science or Range Science. Master of Science and Doctor of Philosophy Degrees may be earned in Animal Science.

Animal Science Major

Majors receive instruction in animal breeding, feeding and nutrition, management, selection and evaluation, marketing, meats and wool. Courses pertain to beef cattle, horses, poultry, sheep and swine. Instruction in livestock production under both farm and ranch conditions is presented. All students electing the major will complete the same basic core of courses. In addition, the student chooses one of four options: (a) Business, (b) Production or (c) Science, or (d) Teaching. 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

Freshman Year	**F**	**S**
Fr Comp, Engl 101 or 191	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	9
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	7
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		2
Option and elective courses	8	9
Senior Year	**S**	**F**
Animal Science Seminar, AS 483	1	1
Option & elective courses	15	16

*See approved list.

Production Option, in order			**Credits**
Algebra, Math 111 or Algebra & Trig, Math 113	3	or	5
Gen Chem, Chem 110 or 112			4
Intro Physics, Phys 101 or Elementary Physics I, Phys 111 or General Physics I, Phys 211			4
Organic Chem, Chem 120			4
Livestock Evaluation, AS 212			2
Anatomy & Physiology of Livestock, Vet 223†			4
Gen Microbiology, Micr 231			4
Livestock Marketing, AS 312			2
Feed Technology, AS 333			3
AS Production Courses. Elect from: AS 365, 366*, 433, 474, 478, or Rang 200.			9
Group I electives			9
General electives			23-29

*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
Chem courses including Elementary Biochemistry, Chem 260	14
Algebra & Trig, Math 113, & Calculus for non-Math majors, Math 222, or Algebra, Math 111; Plane Trig, Math 120 & Calculus for non-Math Majors, Math 222	10 or 11
Gen Microbiology, Micr 231	4
Elementary Physics I-II, Phys 111-113 or Gen Physics I-II, Phys 211-213	8
Feed Technology, AS 333	3
Anatomy, Zool 221	3
Mammalian Physiology, Zool 325	4
AS Production Courses, AS 365, 366*, 474, 477, 478	6
Group I electives**	6
General electives	18-19

*AS 592 Special Topics is available for students interested in addition specialized instruction in the poultry industry.
**Except 101 and 223 which are required of all Animal Science majors.

Business Option, in order	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
Organic Chem, Chem 120	4
Microeconomics Principles, Econ 202	3
Prin of Accounting I, Actg 210	3
Livestock Evaluation, AS 212	2
Anatomy & Physiology of Livestock, Vet 223†	4
Livestock Marketing, AS 312	2
Feed Technology, AS 333	3
Communications elective in addition to core requirement**	2 or 3
Business Management B-AD 360	3
AS Production Courses. Elect from: AS 365, 366*, 433, 474, 478, or Rang 200.	6
Business electives	12
Group I electives	6
General electives	6-13

*AS 592 Special Topics is available for students interested in additional specialized instruction in the poultry industry.
**To be chosen from Engl 303; MCom 210, 313, 315, 330, 331, 335; SpCm 315, 334, 335.
†Students planning graduate work or who plan to go into veterinary science should substitute Zool 221 and 325.

Specialized Teaching Option*	Credits
This option requires a total of 133-134 credits to complete.	
All Production Option Courses**	48-50
Educational Psychology, EPsyc 302	2
Teaching of Reading, SeEd 405	3
Indians of North America, Anth 421 or History of Am Indians, Hist 368	3
Prin of Vocational Education & Practical Arts, VTTE 405	2
Seminar in Ag Ed, Ag Ed 301 or Summer Experience in Ag Ed, Ag Ed 470	1
Program Planning in Vo Ag, AgEd 404	4
Special Methods in VoAg, AgEd 434	3
Teaching Ag Mechanics, AgEd 454	2
Student Teaching Ag Ed, AgEd 475	8
Welding, ES 131	2
Mechanized Ag electives†	5

*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.
**General Psychology, Psyc 101 must be taken as the Social Science elective.
†To include 6 credits from MA 202, 213, 333, 342, 423, 433, and 463.

Undergraduate Courses

101 Intro to Animal Science 3(2,2) FS
Adaptation, breeding, feeding, marketing, classification, selection of market and breeding types of beef cattle, horses, sheep, swine and poultry.

105 Horsemanship 1(0,2) FS
Breeds of riding horses, gaits, grooming, equipment, rations; basic riding instruction with western type equipment.

212 Livestock Evaluation 2(0,4) F
Evaulation of market classes of beef cattle, sheep and swine on foot and in the carcass. Judging and evaluating breeding animals, including horses. Preparation for judging competition. P, 101.

219 Livestock Management 3(2,2) F
Not open to AS majors. Recommendations for feeding and breeding systems, diseases and sanitation, housing, space requirements and other practices. P, 101.

223 Animal Nutrition 3(3,0) FS
Functions of various nutrients; digestion and metabolism of nutrients by different animal species. Chem 120 desirable antecedent. P, sophomore standing.

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, 212.

312 Livestock Marketing 2(2,0) FS
Livestock marketing methods, involving problems of transportation, terminal market practices, methods of selling; factors determining livestock prices; selling purebred livestock. 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, 212.

332 Prin of Animal Breeding 4(3,2) FS
Application of genetics to improvement of farm animals. Emphasis on occurrence, origin, use and control of variation in economically important traits of farm livestock. P, Bio 371.

333 Feed Technology 3(3,0) FS
Classification and nutritional characteristics of feedstuffs; methods of evaluating feedstuffs; principles of ration formulation and balancing for farm animals; preparation, processing, handling and storage of feedstuffs and feed regulation and control. P, 223.

345 Meat Technology 3(2,2) AY-S
(Offered in 1983) 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, juding and grading carcasses and cuts; training in writing reasons; participation in intercollegiate meat judging contests. P, 212, 251.

365 Horse Production 3(2,2) S
Feeding, breeding and management principles for light horses. P, 101.

366 Poultry Management 3(3,0) F
Development and organization of the poultry industry, its economic importance and relation to total agriculture. Biology of the fowl. Management practices with emphasis upon the genetic, nutritional, disease, housing and equipment aspects.

432 Advanced Livestock Judging 1(0,2) F
Continuation of 322. Trips to purebred herds; participation in American Royal and International Livestock Judging contests. P, 322.

433 Livestock Reproduction 3(2,2) F
Basic physiological processes of reproduction in domestic animals, factors affecting and methods of improving reproductive efficiency. P, Vet 223.

474 Beef Cattle Production 3(2,2) FS
Feeding, breeding and management principles for 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.

178 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.

183 Animal Science Seminar 1(1,0) FS
Review of current research, discussions and reports. Limit 2 credits. P, senior standing.

194 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

523-623 Population Genetics 3(3,0) AY S
(Offered in 1984) Genetic structure of populations and forces affecting this structure. Theories of biological variation, race and species formation. P, Bio 371 or equivalent, Stat 641 or equivalent highly recommended.

531-631 Animal Nutrition 3(3,0) AY S
(Offered in 1983)

532-632 Animal Nutrition Laboratory 2(0,6) AY S
(Offered in 1983)

536-636 Avian Nutrition 3(2,2) AY S
(Offered in 1984) Nutritional requirements and deficiency signs, peculiarities of digestive physiology, formulation of diets and dietary effects upon quantity, quality and efficiency of production of chickens, turkeys, pheasants, ducks, geese. P, 223, desirable antecedents 333, 366.

553-653 Meat Science 3(2,2) AY S
(Offered in 1984) Basic physical, chemical, microbiological and histological characteristics of meat and effects of various processing methods on meat products and by-products. P, 241.

591-691 Research Problems 1-3 FSSu Investigation of problems in following areas with results submitted as technical paper: Animal breeding, Nutrition, Meats, Livestock Production, Reproductive Physiology, Wool Technology, Poultry. Maximum of 3 credits for student program.

592-692 Special Topics 1-6 FS
Advanced study of one or more selected topics: breeding, management, product technology, physiology, nutrition, research methods or marketing.

711 Ruminology 3(3,0) AY F
(Offered in 1983)

731 Experimental Procedure 2(2,0) AY S
(Offered in 1983)

732 Advanced Physiology of Reproduction 3(2,2) AY S
(Offered in 1984)

733 Nutritional Interrelationships 3(3,0)F

781 Graduate Seminar 1(1,0)FS

782 Nutrition Seminar 1(1,0) F

790 M.S. Thesis in Animal Science FSSu

890 Ph.D. Thesis in Animal Science FSSu

Range Science (Rang)

Offered for those interested in ranching, banking, mining and other industries. Graduates meet the qualification standards for Office of Personnel Management rosters for Range Conservationist and Soil Conservationist leading to employment by the Soil Conservation Service, Bureau of Land Management, Forest Service, Bureau of Indian Affairs, and other federal agencies. The breadth of this curriculum prepares the graduate for employment with the Extension service and with various state and federal agencies involved in resource management, land appraisal, lending activities or regulatory functions. The graduate may also qualify for range management assistance positions in developing countries. Furthermore, the curriculum prepares the student to enter graduate school leading to various kinds of employment, including research and university teaching.

Curriculum in Agriculture, Range Science Major

Leading to the Bachelor of Science degree.

Freshman Year	F	S
Gen Comp, Engl 101 or 191	3	
Fitness & Lifetime Activities, PE 100	1	1
Gen Chem, Chem 110	4	
Organic Chem, Chem 120		4
Intro Biology, Bio 151, 153	3	3
Algebra & Plane Trigonometry, Math 113	5	
or Algebra & Trig, Math 111-120	3	3
Intro to Sociology, Soc 100		3
Fund of Speech, SpCm 101		3
Sophomore Year	**F**	**S**
Intro to Animal Science, AS 101	3	
Agrostology, Bot 205	3	
Plant Taxonomy, Bot 261		4
Macroeconomics Principles, Econ 201		3
Animal Nutrition, AS 223	3	
Practical Range Management, Rang 200	3	
Soils, PS 113	3	
Intro Physics, Phys 101 or Elementary Physics I, Phys 111 or Gen Physics I, Phys 211		4
Social Science Elective		3
Humanities elective*		3
Junior Year	**F**	**S**
Junior Comp, Engl 300	3	
Prin of Range Science, Rang 300	3	
Range Ecosystems, Rang 321		3
Plant Ecology, Bot 415	4	
Soil Geography & Land Use Interpretation, PS 310		4
Forage Crops & Pasture Management, PS 313	3	
Statistical Methods I, Stat 341	3	
Advanced Exposition, Engl 303 or Publicity Methods, MCom 313		2-3
Genetics, Bio 371		3
Gen Forestry, F 131 or Dendrology, F 231 or Forest Ecology, F 232		2-3
Special Summer Session		**Su**
Range Analysis, Rang 322		3
Field Studies in Range Science, Range 421		2
Senior Year	**F**	**S**
Range Improvement, Rang 411		2
Range Management Planning for Ranchers, Rang 471	2	
Range Management Planning on Public Lands, Rang 470	2	
Beef Cattle Production, AS 474		3
Sheep & Wool Production, AS 477	3	
Farm & Ranch Management, Econ 271		4
Plant Physiology, Bot 427	4	
Wildlife Management, WL 411	4	
Humanities electives*		3
Electives		1-4

*See approved list.

200 Practical Range Management 3(2,2) F
An overview of range management, stressing practical applications for all uses on ranches 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, max. 3
Instruction and practice in the recognition of important range plants of the U.S. P, instructor's consent.

300 Principles of Range Science 3(3,0) AY F
(Offered in 1984) Basic principles of range science including structure, function and management of range ecosystems. Factors affecting energy flow, the water cycle and nutrient cycles are stressed in relation to management strategies on ranches, public, and reclaimed lands. Desirable antecedents: 200, Bot 261, PS 113.

321 Range Ecosystems 3(3,0) AY S
(Offered in 1984) Description of the range ecosystems of the U.S. with a discussion of the major uses of each and the problems of management on private ranches and on public and reclaimed lands. The major range plants and animals of each region will be studied including the ecology, forage value and management response of important range plant species. P, 300; Bot 205, 261.

323 Range Measurements 2(2,0) AY S
(Offered in 1983) Principles of sampling and measurements of important characteristics of range ecosystems. Special attention given to measurement of attributes of soil, vegetation and grazing animals for the management of public and private rangeland for multiple uses (including watershed values) and for the documentation of the reclamation of surface-mined lands. P. 300; Stat 341.

324 Range Surveys 2(0,6) AY Su
(Offered in 1983) Surveys to determine attributes of range vegetation; to determine and map range site, range condition and trend in range condition; to determine and map utilization patterns; to determine potential stocking rates for grazing animals; to document changes in response to management of ecosystem characteristics. Ecological characteristics and field recognition of important range plants stressed. P. 323. Desirable antecedent, PS 310.

411 Range Improvement 2(2,0) AY S
(Offered in 1984) Management of private and public ranges for optimum biological and economic output, considering various products and values. Emphasis on the planning application and effect of grazing management, tillage, seeding, plant control, and related practices for range improvement and reclamation. P, 200 or 300.

421 Field Studies in Range Science 2(0,4) AY Su
(Offered in 1984) Extended field trip to study major uses and management problems on private ranches, mining lands, and public lands in various range regions. Field recognition and ecological characteristics of range plants and animals is stressed.

470 Range Management Planning On Public Lands 2(1,2) AY S
(Offered in 1983) 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. Societies interest in land management. P, 411.

471 Range Management Planning for Ranchers 2(1,2) AY F
(Offered in 1984) Range management planning in the context of operating ranches. Comparison of management strategies for determining optimum production using biological, economic and social criteria. P, 411.

494 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.

Graduate Courses

581-681 Range Science Seminar 1(1,0) AY S
(Offered in 1983) Review of current literature, research programs, and action programs in the management and the use of rangelands. P, 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.

MINOR: Twelve hours of Range Science (to include 300, and either 470 or 471) and 5 hours of plant identification (Bot 305, 261, or RANG 201)

Army ROTC

(See page 131, Military Science)

Art (Art)

College of Arts and Science

Associate Professor Jordan, Head; Professors Edie, Moore (Emeritus); Associate Professors Berry (Emeritus), Morgan, Spinar; Associate Professor and Director of Memorial Art Center J. Stuart; Assistant Professors Boyd, Kruse, Lazarus, S. Stuart; Instructor M. Sellard.

The curricula in Visual Arts are designed to provide fundamental experience 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 or graduate study.

For a Bachelor of Arts or Bachelor of Science degree, an Art Major must:

1. Meet University and Arts and Science College requirements.
2. Take 57 hours of Art, including:
   a. Core courses
   b. Art History/Theory (12 sem. hrs.)
   c. Required courses in area of concentration: Visual Arts, Art Education, or Applied Design.
3. Present a portfolio for evaluation at the end of the Sophomore year.
4. Have an exhibition of creative work or presentation of a portfolio during the Senior year.

A minor in Visual Arts requires 24 semester hours, including at least two courses in Art History.

Student work is screened and exhibited throughout the school year in the Ritz Gallery, the Art Department's student and faculty art gallery, 104 Solberg Hall.

The Art Department reserves the right to retain selected examples of student work.

Curriculum in Arts and Science, Art Major

Leading to the degree Bachelor of Arts or Bachelor of Science

Basic University Requirements, Page 11-18.

Basic Arts and Science Requirements, Page 33-37.

Additional courses, not offered under Art (e.g. Introduction to Film, Photography, etc.), may be counted as credit for the major with permission of the Department Head and area of concentration supervisor.

Requirements plus electives must total a minimum of 128 credit hours.

Suggested Curricula
Freshman & Sophomore Years
Visual Arts Core plus Electives

	F	S
ArtS 112 Drawing I	3	
ArtS 113 Drawing II		3
ArtS 122 Design Fundamentals	3	
ArtS 123 Three Dimensional Design		3
ArtS 211 Drawing III (Figure)	3	
ArtS 222 Color Theory		3
ArtH 211 Survey of World Art	3	
ArtH 212 Western Traditions in Art		3
Art Electives (100 or 200)	3	

Junior & Seniors Years
Visual Arts Emphasis
Painting Concentration:

ArtS 231 Painting IA & IB	3	

ArtS 332 Painting IIA & IIB	3		3
ArtS 281 Printmaking IA & IB	3		3
ArtS 382 Printmaking IIA & IIB	3		3
ArtS 430 Watercolor	3	or	3
Art History (2 courses)	3		3
Electives (1 three-dimensional)	3		3

Printmaking Concentration:

ArtS 281 Printmaking IA & IB	3		3
ArtS 382 Printmaking IIA & IIB	3		3
ArtS 231 Painting I	3		3
ArtS 430 Watercolor	3	or	3
Art History (2 courses)	3		
Electives (1 three-dimensional)	3		3

Sculpture Concentration:

ArtS 241 Sculpture IA & IB	3		3
ArtS 342 Sculpture IIA & IIB	3		3
ArtS 397 Directed Studies Sculpture	3		3
Basic Photography (1 course)	3		3
Art History (2 courses)	3		3

Ceramics Concentration:

ArtS 253 Ceramics I	3	or	3
ArtS 352 Ceramics II	3	or	3
ArtS 397 Directed Studies	3	or	3
ArtS 241 Sculpture I	3	or	3
ArtS 342 Sculpture II	3	or	3
Art History (2 courses)	3	or	3
Electives (ArtS 231, 270, 281 or 370)	3		3

Applied Design Emphasis:

ArtD 231 Graphic Design I	3	or	3
ArtD 330 Graphic Design II (2 sem)	3	or	3
ArtS 382 Printmaking II			3
MCom 211 Typography	3	or	3
MCom 160 Basic Photography	3		
ArtS 494 Cooperative Education/Internship/ Field Experience (Topical)	3-12		
Electives (2 courses, Art or MCom)	3		3

Art Education Emphasis:

The following courses are required:	**F**		**S**
ArtS 253 Ceramics I	3	or	3
ArtS 241 Sculpture I	3	or	3
ArtE 415 Methods of Teaching Art in Public Schools	3		
Art History (2 courses)	3		3
Education Block, Practice Teaching (26 hours)			

The remaining 18 hrs. in Art may be used to concentrate in a studio area or taken as general art credit.

Undergraduate Courses

Art Design (ArtD)

112 Lettering 3(0,6) S
History, design and skill development of hand lettering.

231 Graphic Design I 3(0,6) F
Design as applied to contemporary programs of graphic communication in industry. P, ArtS 123; ArtD 112, or consent of instructor.

330 Graphic Design II 3(0,6) On sufficient demand
Emphasis on packaging and promotional aspect of graphic design. May be repeated once. P, 231.

Art Education (ArtE)

415 Methods of Teaching Art in Public Schools 3(1,4) F
P, art major and junior standing.

Art History (ArtH)

211 Survey of World Art 3(3,0) F
Principal periods in the history of major world civilizations up to the 15th century A.D.

212 Western Traditions in Art 3(3,0) S
Principal artistic styles of the world as contributors to Western cultures. Renaissance to present.

310 History of U.S. Art 3(3,0) S
From colonial to present.

412 Studies in Contemporary Art 3(3,0)
Surveys of specific periods and topics in 19th to 20th century art.

420 Seminar, Selected Topics in Art 1(1,0)
Selected topics in Art History, Theory, or Criticism. Topics vary, may be repeated once. P, junior or senior standing.

480 Exhibition Concepts 3(3,0) on sufficient demand
Practical training in the development, management and design of art exhibitions.

Art Studio (Art S)

112 Drawing I 3(0,6) FS
Development of visual perception in representational and expressive drawing with various media.

113 Drawing II 3(0,6) S
Emphasis on composition. P, 112.

122 Design Fundamentals 3(0,6) FS
Studio approach to visual arts through critiques, lectures, and studio participation dealing with design fundamentals.

123 Three Dimensional Design 3(0,6) S
Three dimensional experiences. Organization of mass, plane, color and space. P, 122 recommended or consent.

211 Drawing III 3(0,6) F
The human figure. P, 112 or consent.

222 Color Theory 3(0,6) S
Color, its action and interaction in relation to design properties. P, 123; recommended 112 or consent.

231 Painting IA & IB 3(0,6) FS
Techniques and fundamental theories. Principal media is oil or acrylic.* P, 113 or consent.

241 Sculpture IA & IB 3(0,6) FS
Sculptural forms and experience through the use of basic forming processes and materials.* P, 122 or consent.

253 Ceramics I 3(0,6) F
Handbuilding, glazing, and firing.* P, 123 or 122 or consent.

270 Textile Design 3(0,6) On sufficient demand
Experience in textile design to obtain surface enrichment.* P, 123 or consent.

281 Printmaking IA & IB 3(0,6) F
Creative use of basic printmaking techniques and processes in relief, intaglio and serigraphy.* P, 113 or consent.

300 Experimental Arts 3
Alternative art-making problems, utilizing non-traditional materials and presented in a conceptual framework of 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, 231.

342 Sculpture IIA & IIB 3(0,6) S
Continuation of Sculpture I (ArtS 241). Emphasis on composition and expression.* P, 241.

352 Ceramics II 3(0,6) S
Continuation of Ceramics I. Emphasis on wheel throwing, glazing, stacking, and firing.* P, 253.

370 Weaving 3(0,6)
Design and execution of handwoven fabrics. Experience with various types of looms.* P, 123 or consent.

382 Printmaking IIA & IIB 3(0,6) S
Creative use of advanced printmaking techniques and processes in relief, intaglio and serigraphy.* P, 113, 123, or consent.

396 Undergraduate Course Special Program 1-3(0,6)
See Arts and Sciences College Alternatives and Options. P, permission of department.

397 Directed Studies Program 1-9(0,3-18)
See Arts and Sciences College Alternatives and Options. P, permission of department head and instructor. Limited to no more than 3 semester hours

under any single instructor. May be continued with more than one instructor, or under a different sponsor.

400 Seminar in Art Criticism 3(3,0)

Reading and discussion of criticism and aesthetics of contemporary art. Analyses of various critical stances and instruction in writing about visual arts. P, junior or senior standing.

430 Watercolor 3(0,6)

Comprehensive problems in painting with transparent and opaque watercolors. P, 113 and permission of instructor.

491-492 Problems in Visual Arts 3(0,6) FS

Independent study in art area arranged in consultation with the professor sponsor. Limited to seniors with a 3.0 average in art and a working background in the art problem they wish to undertake.

494 Cooperative Education/Internship/Field Experience 1-12, FSSu

You may elect to initiate and complete a major problem off campus. All visual art majors may also gain experiential work experience in co-op jobs with selected employers and/or artists (students may be engaged as studio apprentices). These work experiences are to be held concurrently with regular study periods and may be arranged through the department's Cooperative Education Coordinator. P, junior standing, consent of Department Head and advisor.

497 Living & Studying Abroad Program 1-15(1-15,3-30)

See Arts and Sciences College Alternatives and Options. P, permission of department.

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* May be repeated once.

Biology (Bio)

Including the areas of Botany (Bot) and Zoology (Zool)

College of Agriculture and Biological Sciences

Professor Hugghins, Head; Professors Chen, Granholm, Haertel, J., Holden, Morgan, Myers; Professors Emeritus Hartwig, Taylor; Associate Professors Haertel, L., Hutcheson, McMullen, Morrill, Olson, Peterson, Thibodeau, Whalen; Assistant Professors Gregory, Larson, Wilkin; Instructor Trautman.

The Biology Department offers curricula leading to the Bachelor's degree with majors in biology, botany, environmental management and zoology. Flexibility in the curricula allows you to follow pre-professional programs such as medicine, dentistry and optometry (see College of General Registration for details) or second majors in such fields as Microbiology, Chemistry, Clinical (Medical) Laboratory Technology (see coordinator of CLT program in Chemistry Department) and Physical Therapy (see coordinator of PT program in HPER). The Department offers a program for teaching in secondary schools through substitution of education courses for general electives.

The courses taught in this department are designed to: 1) prepare you for specific fields in biological science; 2) provide fundamental principles for advanced work in various fields of the biological sciences, agriculture and health professions; 3) present the general biological principles required to comprehend the complexities of living systems and their interactions.

Biology

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

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, 153, Bot 200, 201, 301, 415 and 421.

Zoology

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

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.

Black Hills Natural Sciences Field Station

SDSU has joined with other universities and colleges in the state to jointly sponsor the Black Hills Natural Science Field Station. Summer course offerings of the field station include courses in Biology, Geology and Anthropology, which affords you a greater amount of actual experience in a natural environment as well as more personalized instruction. Courses are available each summer for both graduate and undergraduate credit. Special topics and independent studies are also available. For additional information, contact the Department of Biology or your academic advisor.

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 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Gen Chem, Chem 112, 114	4		4
Algebra & Trigonometry, Math 113 (or Algebra, Math 111 & Plane Trigonometry, Math 120)	5		
Intro Biology, Bio 151, 153	3		3
Electives (recommend Math 222 or 123)			5
Sophomore Year			
Macroeconomic Principles, Econ. 201			3
Organic Chem, Chem 222, 224 (or Organic Chem, Chem 120 & Chem elective. Recommend Chem 260)	4		4
Gen Microbiology, Micr 231	4		
Prin of Ecology, Bio 211	3		
Plant Kingdom, Bot 201			3
Animal Kingdom, Zool 203	3		
Intro to Sociology, Soc 100			3
Social Science elective			3
*Elective	2		
Junior Year			
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		
Statistical Methods I, Stat 341 (or general elective)	3		
*Elective (recommend Histological Techniques, Bio 445)			3
Senior Year			
Communications Elective (recommend Writing in Biological Science, Engl 393)	2		
Seminar, Bio 492	1		
Electives in Biological Sciences	3-4		
Physiology elective, Bot 427 or Zool 325			4
*Electives (recommend Biological Science courses; CSc 271; Chem 260 or 360)	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 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Gen Chemistry, Chem 110 (or Chem 112-114)	4		
Algebra & Trigonometry, Math 113 (or Algebra, Math 111 & Plane Trigonometry, Math 120)			5
Intro Biology, Bio 151, 153	3		3
*Social Science (approved list: two areas)	3		3
*Elective	2		1
Sophomore Year			
Humanities elective (approved list: two areas)	4		
Organic Chemistry, Chem 120 (or Chem 222-224)	4		
General Microbiology, Micro 231			4
Principles of Ecology, Bio 211	3		
Plant Kingdom, Bot 201			3
Animal Kingdom, Zool 203	3		
Social Science elective (approved list: two areas)			3
*Electives (recommend Bio 295; Math 122 or 223; CSc 271)	2		6
Junior Year			
Junior Composition, Engl 300	3		
Introductory Physics, Phys 101 (or Phys 111-113)	4		
Genetics, Bio 371	3		
Cell Biology, Bio 343			3
Electives in Biological Sciences	3		
Social Science electives (approved list; two areas)			3
Humanities elective (approved list; two areas)			4
*Electives (recommend Statistical Methods, Stat 341 in Fall; Histological Techniques, Bio 445 in spring)	3		6
Senior Year	**F**		**S**
Seminar, Bio 492	1		
Electives in Biological Sciences	3-4		
Physiology elective, Bot 427 or Zool 325			4
*Electives (recommend Biological Science courses; Biochemistry, Chem 260)	11-12		12

*The college of Arts and Sciences requires that at least 40 semester credits of the 128 total for graduation be upper division (300 and above).
If a student plans to teach Biology with this curriculum, see Education Curriculum for Teachers of Academic Subjects and consult with Dean of Education. SeEd 416 required for teaching option.

Curriculum in Arts and Science, Biology Major

Leading to the Bachelor of Arts Degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
General Chemistry, Chem 110 (or Chem 112-114)	4		
Algebra & Trigonometry, Math 113 (or Algebra, Math 111 & Plane Trigonometry, Math 120)			5
Intro Biology, Bio 151, 153	3		3
Foreign Language	4		4
*Elective	1		
Sophomore Year			
Social Science elective (approved list; two areas)	4		
Humanities (approved list; two areas)			4
Organic Chemistry, Chem 120 (or Chem 222-224)			4
General Microbiology, Micro 231	4		
Principles of Ecology, Bio 211	3		
Plant Kingdom, Bot 201			3

Foreign Language	3	3
Animal Kingdom, Zool 203	3	
Elective	1	
Junior Year		
Junior Comp, Engl 300	3	
Intro Physics, Phys 101 (or Phys 111-113)	4	
Cell Biology, Bio 343		3
Genetics, Bio 371	3	
Electives in Biological Sciences		3-4
Humanities (approved list: two areas)	4	4
Social Science electives (approved list; two areas)		4
*Electives	2	1-2
Senior Year		
Seminar, Bio 492	1	
Electives in Biological Sciences	3-4	
Physiology elective, Bot 427 or Zool 325		4
Social Science electives (approved lists; two areas)		4
Electives (recommended Biological Science courses; Statistical Methods, Stat 341; Biochem, Chem 260; Computer Programming & Data Processing, CSc 271; Calculus for non-Math majors, Math 222)	11-12	8

* 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 Botany 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 Biological Sciences, Botany Major

Leading to the Bachelor of Science Degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Gen Chem, Chem 112, 114	4		4
Algebra, Math 113 (or Algebra, Math 111 & Plane Trig, Math 120)	5-6		
Intro Biology, Bio 151, 153	3		3
*Electives			5
Sophomore Year			
Intro to Sociology, Soc 100	3		
Macroeconomics Principles, Econ 201			3
Plant Kingdom, Bot 201			3
Organic Chem, Chem 120	4		
Elementary Biochem, Chem 260			4
Humanities electives	3		3
Group 1 courses in Ag	3		3
*Electives	3		3
Junior Year			
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			2
Social Science Elective	3		
*Electives	3		3
Senior Year			
Plant Ecology, Bot 415	4		
Plant Anatomy, Bot 421	3		
Plant Physiology, Bot 427	4		
Histological Techniques, Bio 445			3
Seminar, Bio 492			1
Zoology Elective			4
*Electives	5		8

* The college of Agriculture and Biological Sciences requires that at least 25 semester credits of the 128 total for graduation be upper division (300 and above). If you plan to teach Botany 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, Botany Major

Leading to the Bachelor of Science Degree

Freshman Year	**F**	**S**
Fr Comp, Engl 101 or 191	3	
Fund of Speech, SpCm 101		3
Fitness & Lifetime Activities, PE 100	1	1
Gen Chem, Chem 110	4	
Algebra & Trigonometry, Math 113 (or Algebra, Math 111 & Plane Trigonometry, Math 120)		5
Intro Biology, Bio 151, 153	3	3
Social Science (Approved List; 2 areas)	3	3
*Electives	2	1
Sophomore Year		
Social Science (Approved List; 2 areas)	3	3
Plant Structure & Function Bot 200	3	
Plant Kingdom, Bot 201		3
Organic Chem, Chem 120	4	
Microbiology, Micr 231		4
Humanities elective (Approved List; 2 areas)	4	4
*Electives	2	2
Junior Year		
Junior Comp, Engl 300	3	
Genetics, Bio 371	4	
Plant Taxonomy, Bot 301		4
Zoology Elective		4
Chemistry Elective	4	
Intro Physics, Phys 101		4
Histological Techniques, Bio 445		3
*Electives	5	1
Senior Year		
Plant Ecology, Bot 415	4	
Plant Anatomy, Bot 421	3	
Plant Physiology, Bot 427	4	
Seminar, Bio 492		1
*Electives	5	15

* The college of Arts and Sciences requests that at least 40 semester credits of the 128 total for graduation be upper division (300 and above).
If a student plans to teach Biology with this curriculum, see Education Curriculum for Teachers of Academic Subjects and consult with Dean of Education. SeEd 416 recommended for teaching option.

Curriculum in Biological Science, Environmental Management Major

Leading to a Bachelor of Science Degree

Freshman Year	**F**	**S**
Fr Comp, Engl 101 or 191	3	
Fitness & Lifetime Activities, PE 100	1	1
Intro Biology, Bio 151, 153	3	3
General Chem, Chem 112, 114	4	4
College Algebra: Math 113 (or Math 111; Math 120)	5	
Fund of Speech, SpCm 100		3
Intro to Sociology, Soc 100		3
Electives (from Approved List)**		3
Sophomore Year		
Prin of Ecology, Bio 211	3	
Organic Chem, Chem 222, 224 (or Organic Chem,		

Chem 120 & Chem elective. Recommend Chem 260)	4	4
Soils, PS 113	3	
Elementary Physics, Phys 111-113 (or Physics 211, 213)	4	4
Gen Microbiology, Micr 231		4
Macroeconomics Principles, Econ 201		3
Electives§	2	1
Junior Year		
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		
Seminars†	1	1
Humanities Electives	3	3
Electives (from Approved List)**		7
Electives§	5	5

*Communications elective to be selected from the following: Engl 303, 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, 373, 383, 472, 551; Bot 200, 301, 415; Chem 380; Ent 105, 293, 295, 391, 511; F 131, 232, 331; Geog 464; HSc 440, 443; La 324, 421; MA 463; Micr 310, 412; PS 223, 233, 310, 323, 483; PolS 320, 408; Rang 300, 321, 411, 421, 470, 471; Soc 362; Stat 341; WL 210, 363, 367, 411; Zool 203, 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; Ent 611, WL 511-611. The student may elect courses of an environmental nature offered at USD. Some are: Bio 210; Bot 207, 411/611, 412/612, Econ 472; ESci 205; PolS 412; Zool 463.

Curriculum in Biological Science, Zoology Major

Leading to the Bachelor of Science Degree

Freshman Year	**F**	**S**
Intro Biology, Bio 151, 153	3	3
Freshman Comp, Engl 101 or 191	3	
Fundamentals of Speech, SpCm 101		3
Fitness & Lifetime Activities, PE 100	1	1
General Chemistry, Chem 110 (or Chem 112-114)		4
Intro to Sociology, Soc 100	3	
Algebra & Trigonometry, Math 113 or Math 111-120	5-6	
Humanities Elective		3
*Elective		3
Sophomore Year		
Elementary Physics (or Phys 111-113)	4	4
Macroeconomics Principles, Econ 201	3	
Elementary Organic Chemistry, Chem 120	4	
Elementary Biochem, Chem 260		4
Prin of Ecology, Bio 211	3	
Humanities (from Approved List)		3
*Electives	3	
General Microbiology, Micr 231		4
Junior Year		
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	
Communications elective (from list under Core Curric in Biol Sci)	2	
Biological Literature, Bio 295	1	
*Electives (from Approved List)		6
Senior Year		
Communications elective (from list under Core Curriculum in Biol Sci)		2
Social Science (from approved List)		3
Vertebrate Histology, Zool 441	3	
Statistical Methods, Stat 341	3	
Seminar, Bio 492		1
*Electives	10	10

*Any course in the General Catalog but recommend the following: Bio 445 and Zool 457 and other courses with Bio, Zool, or Ent prefix; WL 363, 367; Micro 310, 422, 423, 536.
The college of Agriculture and Biological Sciences requires that at least 25 semester credits of the 128 total for graduation be upper division (300 or above). If a student plans to teach with this curriculum, see Education Curriculum for teachers of academic subjects and consult with Dean of Education. SeEd 416 required for teaching option.

Curriculum in Arts and Science, Zoology Major

Leading to the Bachelor of Science Degree

Freshman Year	**F**	**S**
Intro Biology, Bio 151, 153	3	3
Math 111 or 113	3	
Freshman Comp, Engl 101 or 191		3
Fund of Speech, SpCm 101	3	
Fitness & Lifetime Activities, PE 100	1	1
Gen Chemistry, Chem 110 (or Chem 112-114)		4
Elective in Social Science (from Approved List)	3	
*Electives	3	5-6
Sophomore Year		
Elementary Physics, Phys 101 (or Phys 111-113)	4	
Elementary Organic Chemistry, Chem 120	4	
Elementary Biochem, Chem 260		4
Social Science (from Approved List)		3
Humanities (from Approved List)	2	
Prin of Ecology, Bio 211	3	
Intro to Entomology, Ent 105		3
*Electives	3	6
Junior Year		
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	
Biological Literature, Bio 295	1	
**Electives (see Approved List)	3	
Senior Year		
Vertebrate Histology, Zool 441	3	
Histological Techniques, Bio 445		3
Comparative Vertebrate Anatomy, Zool 457		4
Statistical Methods, Stat 341	3	
Social Science (from Approved List)	3	
Humanities (from Approved List)		3
Seminar, Bio 492	1	
**Electives (see Approved List)	6	6

*General Electives may come from any department listing in the catalog. A suggested elective is CSc 271.
**Fifteen hours of electives must be chosen from the following: Any course with Bio, Zool, or Ent prefix; WL 363, 367; Micro 231, 310, 422, 423, 536.
The College of Arts & Sciences requires that at least 40 semester credits of the 128 total for graduation be upper division (300 and above). If a student plans to teach with this curriculum, see Education Curriculum for Teachers of Academic Subjects and consult with Dean of Education.

The courses in Biology are divided into Biology (Bio), Botany (Bot) and Zoology (Zool).

Undergraduate Courses Biology (Bio)

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; man and the ecosystem. P, Bio 151 and 3 hrs. Bioscience.

271 Heredity & Society 2(2,0) FS
Principles of heredity with emphasis on humans. May not be substituted for Bio 371 and credit will not be granted for both.

295 Biological Literature 1(1,0) F
Literature sources used in various phases of biological research; scientific journals, periodicals, indices, abstracting services; preparation and use of bibliographies. P, one Bot or one Zool course.

343 Cell Biology 3(2,2) S
Cell structure and function with laboratory techniques of culturing and handling cells. P, Bio 151, Chem 120.

353 Intro to Oceanography 3(3,0) S
Physical chemical, geological and biological aspects of oceanography. Ocean resource use. P, 1 year college science.

371 Genetics 3(3,0) FSSu
Principles governing the nature, transmission and function of hereditary material with application to plants, animals, humans, and microorganisms. P, Bio 151 and either Bio 153 or Bot 201 or Zool 203.

372 Genetics Laboratory 1(1,0) 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. Crosslisted 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.

492 Seminar 1(1,0) FS
Presentation of topics based on biological literature in scientific journals. P, three years of coursework.

493 Biological Problems 1-4 FSSu
Individually assigned investigative problems in biology. P, Biol 151.

494 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 field experience and permission of departmental staff. P.

Graduate Courses

507-607 Principles & Techniques in Electron Microscopy 3 FS
Techniques and instruments basic to the preparation, examination and interpretation of specimens with the electron microscope.

551-651 Biology of Algae 4(2,6) S
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.

573-673 Cytogenetics 3(2,3) F (Offered in 1983)
To study the nature and behavior of chromosomes in relation to heredity.

595-695 Strategies in Science Teaching 3(3,0) F
Training in identifying and teaching certain processes deemed fundamental to science and scientific behavior.

597-697 Special Topics (1-5) FS
Irradiation Biology, Teratology, North American Biomes field trip, Chromosome Analysis, Biology and the American Woman.

790 Thesis in Biology (5-7) FSSu

792 Graduate Seminar 1(1,0) FSSu

793 Biological Research Problems 1-3 FSSu

Botany

Undergraduate Courses

200 Botany: 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) FSu
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(1,4) F
Developmental anatomy of seed plant axis and its appendages. Structural fitness of tissues and organs for functions they perform. P, Bio 153 or Bot 200 or Bot 201.

427 Plant Physiology 4(2,4) F
Plant functions and adjustments. P, Bio 151, 153 or Bot 200 or Bot 201, desirable antecedent Chem 120.

Graduate Courses

515-615 Advanced Plant Ecology 4(2,3) S
Analysis of the energy relationships of communities with emphasis on productivity. Literature readings. Laboratory work in techniques of community analysis. P, consent.

527-627 Advanced Plant Physiology 4(1,6) S
(Offered in 1984) Role of organic and inorganic compounds in plant nutrition. P, 424, 427, Chem 120.

585-685 Growth and Development 4(1,6) S
(Offered in 1983) Relations of light, temperature, water, wind, growth regulators, nutrients and other factors to various stages or plant growth and development. P, 424, 427, Chem 120.

597-697 Special Topics FS
Aquatic Plants, Advanced Plant Anatomy, Morphology of Non-Vascular Plants, Morphology of Vascular Plants, Economic Botany.

Zoology

Undergraduate Courses

123 Survey of Anatomy and Physiology 3(3,0) FS
General structure and function of the human body to provide a basic knowledge for the non-science student. Not to be considered as a prerequisite for other zoology courses. Credit may be earned in Zool 123 and Zool 221 only if these two courses are taken in that order.

203 Animal Kingdom 3(2,2) FS
Principles of animal classification, the theories of evolution, how animals grow and reproduce, and distribution of animal life. Provides an understanding of kinds and numbers of animals, structure of representatives of different groups, body processes and ways that animals live. P, Bio 151.

221 Anatomy 3(2,3) FSSu
Structure of various systems of the body as basis for physiology. Models and charts are used with references to skeletons. Injected and embalmed rats are used for a limited amount of dissection.

301 Animal Behavior 3(2,2) F
Animal behavior from many aspects, including communication, social organization, orientation, imprinting, courtship and mating, agonistic behavior, control systems, and the evolution of behavior patterns. P, Bio 151 or consent.

307 Introduction to Medical Science 3(3,0) FS
Biochemical, functional and structural changes in body tissue in relation to the disease process. Pathophysiology of human organ systems. Clinical manifestations of disease. P, Zool 325.

325 Mammalian Physiology 4(3,3) FS
Basic cell physiology. Neural, hormonal and neuroendocrine control systems. Coordinated body functions. P, 4 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 Medical Entomology 3(3,0)
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.

441 Vertebrate Histology 3(1,6) F
Microscopic study of cells and fundamental tissues. Structures of organs and systems are stressed to integrate structure and function. P, Bio 151.

457 Comparative Vertebrate Anatomy 4(2,4) S
Theories of origin of Cordates and Vertebrates. Comparative analysis of vertebrate systems as they occur in various groups. Early Cordates and vertebrates, lamprey, shark, Necturus, and cat comprise laboratory specimens. P, Zool 203.

467 General Parasitology 3(2,2) S
The broad field of animal parasitology, including protozoa, helminths, and arthropods. Emphasis on identification, life histories, control, and economic and medical importance. Laboratory includes morphology and identification of representative groups of parasites, as well as techniques of diagnosis or parasitic disease. P, Bio 151.

497 Special Topics in Zoology FSSu
(As arranged) Qualified students may investigate special topics under supervision of department staff in the following and other selected areas: Human Genetics, Principles of Animal Toxonomy, Helminthology, Herpetology, Biology of Human Sexuality, MCAT Review.

Graduate Courses

523-623 Insect Physiology 3(2,2) S
Fundamental physiological processes in insects. Normal and abnormal functioning of adult and immature stages, developmental physiology, physiology of behavior. P, Chem 120 and consent.

721 Mammalian Anatomy 4(2,6) F

723 Systemic Physiology 4(3,3)

725 Systemic Physiology 4(3,3)

790 M.S. Thesis in Zoology 5-7 FSSu

792 Graduate Seminar in Zoology 1 FS

797 Special Topics in Zoology FSSu (As arranged)

Business Area Studies

The following group of business related courses represents offerings from all academic departments (or in cooperation with other institutions) of interest to majors in the various business related curricula of the university. They are particularly useful as an adjunct to majors in agri-business, agricultural economics, agronomy, animal science, commercial economics, crop science, dairy manufacturing, dairy production, economics, horticulture, interior design, mechanized agriculture, pest management, printing management, pharmacy, restaurant management, soil science, textiles and clothing, and for those following the various engineering major curricula.

Undergraduate Courses

Accounting (Actg)

210 Principles of Accounting I 3(3,0) FS
211 Principles of Accounting II 3(3,0) F

Business Administration (B-Ad)

310 Business Finance 3(3,0) FS
326 Operations Research 4(4,0) FS
350 Business Law I 3(3,0) FS
351 Business Law II 3(3,0) FS
360 Business Management 3(3,0) FS
380 Personal Finance 3(3,0) FS

Computer Science (CSc)

271 Computer Programming 4(3,2) FS

Economics (Econ)

353 Marketing 3(3,0) FS
382 Labor, Law and Economics 3(3,0) F
391 Consumers and the Market 3(3,0) FS
427 Managerial Economics 3(3,0) FS
452 Marketing Management 3(3,0) S
453 Risk Management — Personal and Business 3(3,0) F

Geography (Geog)

454 Industrial and Commercial Site Selection 3(3,0) FS

Mathematics (Math)

241 Mathematics of Finance 3(3,0) S

Mass Communications (MCom)

313 Publicity Methods 2(2,0) FSSu
370 Principles of Advertising 3(3,0) F

Political Science (PolS)

428 Personnel and Budgetary Administration 3(3,0) S

Printing (Prtg)

312 Media Personnel Management 3(3,0) FS
313 Media Labor Management 3(3,0) S
314 Sales Promotional Circulation 3(3,0) FS

Psychology (Psyc)

331 Business and Industrial Psychology 3(3,0) F

Speech

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 Merchandising 3(3,0) S

Chemistry (Chem) Including the area of Medical Technology (MEDT)

College of Arts and Science

Associate Professor Hilderbrand, head; Professors Brandwein, Emerick, Gehrke, Grove, Halverson, Hecht, Jensen, Kenefick, Palmer, Spinar, Wadsworth, Whitehead, Worman; Professors Emeriti Gastler,

Greb, Johnson, Klug, O. Olson, Webster; Associate Professors McRoberts, Rue, Seymour; Assistant Professors Busch, Matthees, Paech, Thiex; Guss (adjunct).

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 491, 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.

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**	
Fr Comp, Eng 101 or 191 or Fund of Speech, SpCm 101	3	or
Gen Chem, Chem 112-114	4	
Mathematical Analysis, Math 123 or Calculus for non-Math Major, Math 222	5	
Biological Science	3	
Fitness & Lifetime Activities, PE 100	1	
Electives*		

Sophomore Year	**F**
Fund of Organic Chemistry, Chem 222-224	4
Elem Physics I-II, Phys 111-113	4
Chemical Calculations, Chem 270	
Electives*	8

Junior Year	**F**
Quantitative Analysis, Chem 232	4
Physical Chemistry, Chem 340 or 342	
Physical Chemistry Lab, Chem 341 or 343	
Junior Comp, Engl 300	3
Electives*	9

Senior Year	**F**
Chemistry Elective**	3-4
Electives*	11-12

*Electives must include 2 years of a foreign language, 1 additional humanities course, and 12 hours of social sciences. Students are also strongly urged to incorporate one of the emphasis programs listed below into their curriculum.

**At least 6 hours of chemistry selected from the following courses must be taken. Chem 260, Chem 330, Chem 344, Chem 345, Chem 352, Chem 360, Chem 380, Chem 382, Chem 434.

Suggested courses for those interested in associated careers in:

Allied Health
Bio 151; Zool 221, 325, 467; Micro 231, 422, 423; Chem 260, 382, 330; Stat 341; CSc 271

Biological Sciences
Chem 260, 330, 360; Biological Science upper division, 9 credits; Bio 151

Education
Chem 260, 352, 380; Educ Requirements

Environmental
Chem 260, 330, 380; 5 of the following: Micro 310, PS 322, Bot 415, Bio 211, Geog 337, HSc 432

Commerce
Chem 330, 354; Econ 201, 202, 301, 302; Stat 341

Quality Control
Chem 260, 330, 352; Stat 341; CSc 271

Curriculum in Arts and Science, General Chemistry Major

Leading to the Bachelor of Science degree

Freshman Year	**F**	
Fr Comp, Eng 101 or 191 or Fund of Speech, SpCm 101	3	or
Gen Chem, Chem 112-114	4	
Mathematical Analysis, Math 123 or Calculus for non-Math Major, Math 222	5	
Biological Science	3	
Fitness & Lifetime Activities, PE 100	1	
Electives*		

Sophomore Year	**F**
Fund of Organic Chemistry, Chem 222-224	4
Elem Physics I-II, Phys 111-113	4
Chemical Calculations, Chem 270	
Electives*	8

Junior Year	**F**
Quantitative Analysis, Chem 232	4
Physical Chemistry, Chem 340 or 342	

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 8 hours of humanities and 12 hours of social sciences. Students are highly encouraged to incorporate into their curriculum one of the emphasis areas listed above.
**At least 6 hours of chemistry selected from the following courses must be taken. Chem 260, Chem 330, Chem 344, Chem 345, Chem 352, Chem 360, Chem 380, Chem 382, Chem 434.

Curriculum in Arts and Science, Professional Chemistry Major

Leading to the Bachelor of Science Degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191 or Fund of Speech, SpCm 101	3	or	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
Chemical Calculations, Chem 270			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 222-224	4		4
Electives*	1		7
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			4
Advanced Chem elective	3		3
Advanced Physics elective	3		
Electives*	9		8

*Electives must include 8 hours of humanities and 12 hours of social sciences.

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 or 191 and Fund of Speech, SpCm 101	3	or	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	1-3		6
Junior Year	**F**		**S**
Junior Comp, Engl 300	3		
Elementary Biochemistry, Chem 260	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		
Elective	10		10-12

*A year of a foreign language is strongly recommended. See other Arts and Science requirements on pages 33-37, and University core requirements pages 11-18.

Clinical Laboratory Technology

Professor J. A. Grove, Coordinator

Directors of Affiliated Schools of Medical Technology: John F. Barlow, M.D., Sioux Valley Hospital, Sioux Falls, SD; Loyd R. Wagner, M.D., McKennan Hospital, Sioux Falls, SD; Harold L. Frost, M.D., Rapid City Regional Hospital, Rapid City, SD; John T. Tidd, M.D., Sacred Heart Hospital, Yankton, SD; W.T. Sweeny, M.D., St. Luke's Hospital, Aberdeen, SD; Henry J. Caes, M.D., Marian Health Center, Sioux City, IA; J. Scott Pennepacker, M.D., St. Luke's Medical Center, Sioux City, IA; Ronald E. Blackmore, M.D., Bethesda Lutheran Medical Center, St. Paul, MN.

Program Directors/Education Coordinators of Affiliated Schools of Medical Technology: Evelyn Bergh, MT(ASCP), Sioux Valley Hospital, Sioux Falls, SD; Sue Lemley, MT(ASCP); McKennan Hospital, Sioux Falls, SD; Bonnie Fingerhut, MT(ASCP), Rapid City Regional Hospital, Rapid City, SD; Linda Miller, MT(ASCP), Sacred Heart Hospital, Yankton, SD; Etta Bassinger, MT(ASCP), St. Luke's Hospital, Aberdeen, SD; Marvin L. Pansegrau, MT(ASCP), Marian Health Center, Sioux City, IA; Gary Miller, MT(ASCP), Nebraska Wesleyan University, Lincoln, NE; Bernadine Goyette, MT(ASCP), Bethesda Lutheran Medical Center, St. Paul, MN.

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 of most major diseases rests on the scientific laboratory findings of the medical technologist. In addition, the role of medical technologist is expanding beyond the scientific aspects to include management and teaching.

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 or 191 and Fund of Speech, SpCm 101	3	3
Gen Chem, Chem 112-114	4	4
Algebra, Math 111	3	
Intro Biology, Bio 151, or Zoology, Zool 203	3	
Anatomy, Zool 221		3
Fitness and Lifetime Activities, PE 100	1	1
*Electives	2	5

Sophomore Year	F	S
Elem Organic Chem, Chem 120	4	
Biochemistry, Chem 260		4
Elem Physics, I-II, Phys 111-113	4	4
Gen Microbiology, Micro 231	4	
*Electives	4	8

Junior Year	F	S
Introduction to CLT Techniques, Chem 381		1
Junior Comp, Engl 300	3	
Mammalian Physiology, Zool 325		4
Quantitative Analysis, Chem 330	4	
Applied Instrumentation, Chem 330		3
Parasitology, Zool 467		3
Immunology, Micro 422		3
Pathogenic Microbiology, Micro 423	4	
*Electives	5	2

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 30 or more credits will be granted. Any credits above 30 may not be used to replace any of the 98 credit hours which must be earned during the three years at SDSU.

Clinical Laboratory Technology (MEDT) Undergraduate Courses

Listed below are course titles and descriptions which are common to most of the hospital schools with which SDSU has affiliation agreements.

Chem 381 Introduction to Clinical Laboratory Techniques.
See description under Chemistry.

MEDT 440 Medical Technology Internship.
Students are to register for this course during the fall and spring semesters of their internship year.

MEDT 441 Medical Technology Orientation
Introduction to the clinical laboratory, the School of Medical Technology and to the basic techniques used in a clinical laboratory. It also acquaints the student with professional ethics and personal and professional responsibility.

MEDT 442 Chemistry
Lecture and laboratory instruction in medically oriented biochemistry as applied to normal and abnormal physiology and analysis of body constituents. Includes instruction in instrumentation and the use of radionuclides in laboratory medicine.

MEDT 443 Hermatology
Lectures and laboratory instruction in the analysis of the cellular elements of the blood and bone marrow, both normal and abnormal, and of the hemostatic mechanisms.

MEDT 444 Immunohematology
Lecture and laboratory instruction in the theory and practice of immu ohematology as applied to blood transfusion, component therapy, immunol gic diagnostic procedures and blood bank administration.

MEDT 445 Immunology
Lecture and laboratory instruction applying the principles of immunology serologic diagnosis.

MEDT 446 Microbiology
Lecture and laboratory instruction in the isolation and identification pathogenic organisms and of their susceptibility to therapeutic agent Includes bacteriology, mycology, virology, and parasitology.

MEDT 447 Clinical Microscopy
Lecture and laboratory instruction on body fluids and urine in regard chemical and cellular composition. In addition, normal and abnormal kidn function is stressed.

MEDT 448 Introduction to Administration
Lectures and/or seminars in the theory and practice of laboratory super sion, management, and/or problem solving.

MEDT 449 Introduction to Education
Lectures and/or seminars in the principles of education to include didact and practical evaluation, methods of instruction, and objective writing.

MEDT 450 Introduction to Research
Directed study and/or projects in specialty area(s) of Medical Technolog

*Eight hours of humanities and twelve hours of social sciences are required. Students are strong encouraged to include some of the following courses as electives: Plane Trigonometry, Math 12 Calculus for non-math majors, Math 222; Genetics, Bio 371; Statistical Methods I, Stat 341; Mycolog PS 453; Intro to Computers and Programming, CSc 311; Programming, CSc 212; Vertebrate Histolog Zool 441.

Chemistry (Chem) Undergraduate Courses

100 Chemistry and Mankind 4(3,3) FS
For non-science majors. Emphasis on the appreciation of chemistry as relates to man and the environment. Duplicate credit for Chem 100, 110 a 112 not allowed. May not be used as a prerequisite for any other course chemistry.

107 Elementary Glassblowing 1(0,3) FS
Fundamental techniques: P, Consent.

110 General Chemistry 4(3,3) FS
A one-semester introduction to chemistry. Not intended for those needi extensive chemistry background. Duplicate credit for Chem 100, 110 and 1 not allowed.

111 Introductory Organic and Biochemistry 5(4,3) FS
A survey of the chemical principles important to biological systems. F students who do not plan to take additional chemistry. Not a prerequisite f any 200 level and above course. Duplicate credit for Chem 111 and 120 or 2 not allowed.

112 General Chemistry 4(3,3) FS
Comprehensive coverage of general chemistry. Preferred for those needi extensive background in chemistry. Duplicate credit for Chem 100, 110 a 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 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 Agriculture, Home Economics. P, 110 or 112. Duplicate credit for Chem 1 222 and 326 not allowed. Duplicate credit for Chem 111 and 120 or 260 allowed.

121 Elementary Organic Chemistry Laboratory 1(0,3) FS
The laboratory portion of Chem 120 for those who have completed 120 3 credits. P, 120.

222-224 Fundamentals of Organic Chemistry 4(3,3) FS
Comprehensive coverage of the fundamentals of organic chemistry. P, (4 credits). Duplicate credit for Chem 120, 222 and 326 not allowed.

232 Quantitative Analysis 4(2,6) FS
Fundamental principles and laboratory practice in gravimetric and volu ric analysis; introduction to instrumental analysis. P, 114 (4 credits).

260 Elementary Biochemistry 4(3,3) FS
Introduction to biochemical processes and the study of compounds of biological interest. P, 120 (4 credits) or equivalent. Duplicate credit for Chem 111 and 120 or 260 not allowed.

270 Chemical Calculations 2(2,0) S
Principles of chemical calculations with computer, statistics, and calculus applications. P, 110 or 112.

326-328 Organic Chemistry 4-5(4,0 or 4,3) FS
Fundamentals of organic chemistry. P, 114 (4 credits). Duplicate credit for Chem 120, 222, 326 not allowed.

327-329 Organic Chemistry Lab 1(0,3) FS
The laboratory portion of Chem 326-328 for those who have completed 326-328 for 4 credits. P, 326-328 (4 credits).

330 Applied Chemical Instrumentation 3(2,3) S
Principles, practices and evaluation of quantitative instrumental methods of analysis used in agricultural, biological, clinical and engineering studies. P, 232 or consent of instructor.

340 Elementary Physical Chemistry 3(3,0) S
Introduction to the principles of physical chemistry for students not desiring the more rigorous course. 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.

360 Intermediate Biochemistry 3(3,0) S
Intermediate level study of biochemical processes of plants and animals, emphasizing the integration and control of their metabolic processes. P, 260.

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) S1983
Theory and practice in instrumental analysis. P, 232, 224, 344, or consent.

494 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu
Planned and supervised professional experience related to chemistry which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

496 Undergraduate Course Specials
See general description in College of Arts and Science alternatives and options.

Graduate Courses*

522-622 Advanced Organic Chemistry 3(3,0) S
Review and discussion of nomenclature, stereochemistry, resonance theory, equilibria, elementary kinetics, intermediate and mechanisms. Chemistry of polymers, heterocyclics, and natural products. P, 224, 344 or concurrent registration.

524-624 Structural Determination of Organic Compounds 3(2,3) F (1983)
Structural determination primarily by spectroscopy. P, 224.

528-628 Physical Organic Chemistry 3(3,0) F (1982)
Physical organic, reaction mechanisms, m.o. calculations, orbital symmetry, and e.s.r. spectroscopy. P, 224.

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

534-634 Analytical Spectroscopy 3(3,0) S (1984)
In-depth treatment of quantitative applications and theory of modern spectroscopy techniques including atomic absorption, emission, and fluorescence; molecular absorption and fluorescence; and X-ray spectroscopy. P, 434.

536-636 Chromatography and Separations 3(3,0) S (1983)
Theory and practice of solvent extraction and paper, thin layer, gas and liquid chromatographic techniques. P, 232.

542-642 Advanced Physical Chemistry 3(3,0) S
A review of the principles and applications of physical chemistry. Topics such as thermochemistry, quantum mechanics, spectroscopy, kinetics, and electrochemistry considered. P, 344.

544-644 Chemical Thermodynamics 3(3,0) F (1982)
Discussion of the laws and theories of classical and statistical thermodynamics as related to macroscopic chemical systems. P, 344.

546-646 Atomic and Molecular Structure 3(3,0) F (1983)
Quantum mechanics and theoretical treatment of chemical structure and binding. P, 224, 344, or concurrent registration in 344.

552-652 Descriptive Inorganic Chemistry 3(2,3) F (1983)
Periodic relationships of the elements. Preparation and purification of typical inorganic compounds. P, 120 (4 credits), 232, 352.

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

560-660 Radioisotope Techniques 4(3,3) S
Theory and measurement of radioactivity. Techniques for application of radioactive isotopes in chemical and biological experimentation. P, consent of instructor.

562-662 Principles of Biochemistry 3-5(3,0 or 3,6) F
Chemistry of biological processes occuring in plants and animals. P, 260.

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

581-681 Bioinorganic Chemistry 3(3,0) F (1982)
A study of biological systems stressing the role of metal ions, primarily the transition metals. Model systems included in the discussion. P, 120 (4 credits), 354 or consent of instructor.

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

720 Special Topics in Organic Chem 1-6

730 Special Topics in Analytical Chem 1-6

740 Special Topics in Physical Chem 1-6

750 Special Topics in Inorganic Chem 1-6

760 Special Topics in Biochemistry 1-6

764 Biochemistry I 3(3,0) S (1983)

766 Biochemistry II 3(3,0) S (1984)

773 Seminar 1(1,0) FS

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

Professor Richardson, head; Professor Kranzler (Emeritus); Assistant Professors Day, Hofer and Melby; Instructors Robbins, Russel and Straub.

Marriage and Family Counseling Center

The center in the department deals with premarital, marital, and family adjustment problems. Clients are assisted in gaining insight into problems and in weighing advantages and disadvantages of alternative adjustments. College students will find understanding and help in the solution of their premarital and marital problems.

Helen Young Laboratory Nursery School

The department through its laboratory provides opportunities for both study and experiences in areas of human development and

family relationships from infancy through parenthood. In the laboratory the student has an opportunity to work with nursery school children and their parents.

Cooperative Programs with Black Hills State College and Dakota State College

Child Development majors electing the Early Childhood Education Option can meet state requirements for elementary certification through cooperative programs with Black Hills or Dakota State Colleges. The BHSC program requires two semesters and a summer at BHSC; the DSC program requires three semesters at DSC.

Minors in Child Development and Family Relations

18 hours of CDFR. All courses for the minor must be approved by the department head no later than the beginning of the junior year.

Majors in Child Development and Family Relations

The department offers three optional areas of emphasis within its curriculum. Majors in Child Development may elect to train for occupations in the following general fields: Child Development — Early Childhood Education, Child and Family Services, and Honors Program.

Academic Standards

Academic standards for admission to the professional courses in Child Development (271, 361, 362, 364, 472, 473) are: no grade lower than a C in 211, and a GPA of 2.0 in the following courses: Introduction to Psychology, Introduction to Sociology, Freshman English.

To be eligible for graduation as a major in Child Development and Family Relations you must have a grade of "C" in the following courses: 271, 361, 362, 472, and 473.

In all options within the department which require one or more of these courses, grades lower than "C" require that the course be repeated until a grade of "C" is earned.

Honors Program

This is designed for the above average student who is primarily interested in a program designed to lead to the M.S. and/or PH.D. degrees. Courses in addition to the core curriculum will be decided in conference with the academic advisers.

Core Curriculum

The core curriculum in Child Development and Family Relations consists of: CDFR 141, 211, 271, 312, 313, 342, 362, 363, 364, 401, 414, 472, 473; Psyc 101; Soc 100; The Home Economics core courses, and the university core.

Child Development and Family Relations — Early Childhood Education Option

This option is for the students interested in early childhood education, nursery school teaching, day care, Head Start and similar work.

Freshman	**Credits**
Family Development, CDFR 101	2
Field Experience, HE 101	2
Career Exploration, HED 101	1
Nutrition and the Family, NFS 101	2
Clothing the Family, TCID 100	1
Housing 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 100, 101, or 191	3
Gen Psychology, Psyc 101	3
Algebra, Math 111 or Math 101, Survey of Math	3
Intro to Sociology, RS 100	3
	30

Sophomore	**Credits**
Human Development and Personality I, Childhood, CDFR 211	3
Home Economics Electives (not in your major field)	2-4
Experience in Human Relations, CDFR 271	3
Electives	15-19
	32-36

Junior Year	**Credits**
Materials and Techniques in Creative Expression, CDFR 361	3
Planning and Methodology for Preschool Programs, CDFR 362	3
Dynamics of Family Dev, CDFR 342	3
Discussion, SpCm 334	2
Junior Comp, Engl 300	3
Human Dev. Psly II: Adol., CDFR 312	2
Human Dev. Psly III: Mid and later yrs., CDFR 313	2
Parent Education, CDFR 364	2
Seminar in CDFR	1
Electives	15-19
	32-36

Senior Year	**Credits**
Current Theories, CDFR 414	
Problems in CDFR, CDFR 443	2
Student Teaching in Preschool Programs I and II, CDFR 472/473	8
Human Dev. Poverty Families, CDFR 363	2
Audio-Visual Methods and Materials, SeEd 405	2
Seminar in CDFR	1
Electives	16-20
	32-36

*To be chosen from at least two areas with different prefixes.

Cooperative Programs

This option, or area of specialization, has the following requirements in addition to those listed above. Professional education and required courses with grades below C will not transfer to Black Hills State or to Dakota State Colleges.

COOPERATIVE PROGRAM AT BLACK HILLS STATE COLLEGE, 2 semesters and 1 summer

Amer Hist Survey I or II, Hist 251 or 252	3
Movement Exp. with Children, PE 359, or Elem Sch. PE, PE 460	2
Hist of Am Indian, Hist 368	3
Survey of Math, Math 101	3
Pract and Prof Lab, SeEd 287	2
Ed Psyc, EPsyc 302	2
First Aid, Hlth 260	2
Amer Govt, PolS 100	3
Chemistry, Chem 100, or 110	3
Drawing I, ArtS 113	3
Intro Biology, Bio 151 or 153	3
Physical Geog, Geo 131	4

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

COOPERATIVE PROGRAM AT DAKOTA STATE COLLEGE, 3 semesters

Hist of Am Indian, Hist 368, or Indians of No. Amer, Anth 421	3
Intro Amer Ed, EdFn 339	2
Prac/Prof Lab, SeEd 287	2
Ed Psyc, EPsyc 302	2
Design I, ArtS 123	3
Amer Govt, PolS 100	3
Phys Geog, Geo 131	3
Survey of Math, Math 101	3
Intro Biology, Bio 151 or 152	3
Amer Hist Survey I, II, Hist 251, 252	6

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

Child Development: Child and Family Services Option

For students interested in working in social work agencies (either public or private) which deal with children, adoptions and other family-related problems; religious services; hospital work with children; community service agencies such as YM/YWCA, Girls/Boys Clubs, Scouting.

Freshman	Credits
Family Development, CDFR 101	2
Field Experience, HE 101	2
Career Exploration, HED 101	1
Nutrition and the Family, NFS 101	2
Clothing the Family, TCID 101	2
Housing and Managing the Family Resources, TCID 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 or 191	3
Gen Psychology, Psyc 101	3
Math	3
Intro to Sociology, RS 101	3
	30

Sophomore	Credits
Home Economics Electives (not in your major field)	2-4
Human Development and Personality I; Childhood, CDFR 211	3
Experience in Human Relations, CDFR 271	3
Electives	23-27
	32-36

Junior Year	Credits
Junior Comp, Engl 300	3
Discussion, SpCm 334	2
Materials and Techniques of Creative Expression, CDFR 361	3
Planning and Methodology for Preschool Programs, CDFR 362	3
Dynamics of Family Development, CDFR 342	3
Human Development in Poverty Families, CDFR 363	2
Parent Education, CDFR 364	2
Seminar in CDFR	1
Human Development and Personality II: Adolescence, CDFR 312	2
Human Dev. and Psly III: Mid and later yrs., CDFR 313	2
Electives	9-13
	32-36

Senior Year	Credits
Seminar in CDFR	1
Current Research and Theories in Child Development, CDFR 414	3
Problems in CDFR, CDFR 443	2
Student Teaching in Preschool Programs I, II, CDFR 472/473	8
Practicum in Child Family Service CDFR 474	4-12
Electives	16-18
	32-36

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

Religious Service Concentration

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

Family and Youth Organization Concentration

HPER Recreation Minor 22

Social Services Concentration

Intro to Social Work, Soc 270 3
Social Legislation, Soc 370 3
Social Problems, Soc 150 2
Personality, Psyc 352 3
Social Psychology, Psyc 441 3
Psychology of Abnormal Behavior, Psyc 451 3
Soc Work Skills and Methods I, Soc 471 3

Children's Services in Hospitals Concentration

Anatomy, Zool 123 3
Gen Chem, Chem 100 4
Health Science 8-10
Emer. Medical Care, Hlth 159 2

Undergraduate Courses

101 Family Development 2(2,0) FS
The Family Life Cycle Developmental sequences and tasks of individuals and the family. Each stage studied in sequence. Interaction of family with community. Management and consumerism principles basic to family relationships.

141 Individual and the Family 2(2,0) FS
Human development, behavior and relationships. Emphasis on social and emotional needs of individual and family. Open to men and women. Personal consultation service available.

211 Human Development and Personality I; Childhood 3(3,0) FS
Knowledge and understanding of human being through study of development beginning at conception continuing to adolescence. Consideration given to biological growth, social, emotional and intellectual development as it changes behavior and shapes the individual. Observation in Nursery School Laboratory.

271 Experience in Human Relations By Reservation Only 3(1,6) FSSu
Opportunity to more fully understand children as well as oneself and other adults while observing and working with children in Nursery School Laboratory. P, 211 with grade of "C".

312 Human Development and Personality II; Adolescence 2(2,0) F
Knowledge and understanding of adolescence within the developmental framework. Dimensions of physical growth, biological changes, social, intellectual and emotional development will be considered, as well as the impact of interaction of these forces on the individual. Emphasis is upon normal developmental patterns.

313 Human Development and Personality III: The Middle and Later Years 2(2,0) S
Developmental approach to middle age and aging. Emphasis on the physical, biological, intellectual and emotional changes. Impact of change upon the personality, self-concept of the individual and their effects upon social behavior, productivity and personal relationships.

342 Dynamics of Family Development 3(3,0) FS
Principles and skills of interaction in marriage and family life. Emphasis given to effective communication, problem solving, decision making, coping with stress, and issues relating to the marriage process and family functioning.

361 Materials and Techniques in Creative Expression 3(2,2) FS
Creativity in language, graphic arts, music, dance, physical and natural science aimed at appreciation, understanding and evaluation of creative production of children in relation to their developmental stages. P, 211, 271, concurrent with CD 362.

362 Planning and Methodology for Preschool Programs 3(3,0) 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 in Poverty Families 2(2,0) F
Human development as influenced by the dynamics of family interaction under the pressures of poverty and slum living. Families of both rural and urban groups are included.

364 Parent Education and Family Counseling 2(2,0) FS
Principles of parent education and family counseling for professional role that will include work with parents. Opportunity for formulation and presentation of program for parents. P, 211, 342.

401 Seminar 1-3 credits FS
Discussion of current literature in areas of human development, early childhood education, marriage, and family counseling.

414 Current Research and Theory in Child Development 3(3,0) FS
Study of topics in human development research and theories. Strong emphasis on learning to read research studies intelligently. Paper on current research topic is required. P, Sr. standing, or instructor's consent.

443 Problems in Family Relations and Child Development 2(2,0) FS
Problem areas in modern family living. Integrating and disorganizing factors affecting marital relationships, parent-child relationships and adequate functioning of family as a whole. Consideration of current findings on such topics as working mothers, young marriages, divorce and remarriage, exceptional children in the home. (Includes field experiences.) Open to men and women from all colleges.

465 Introduction to Developmental Assessment of Young Children 2(2,0) S
Experiences to increase awareness of and knowledge about a variety of assessment procedures appropriate for use with children from birth through eight years of age. Advantages and limitations of assessment techniques noted; considerations used in the interpretation of findings and in making referrals discussed. Includes opportunities to work with assessing preschool age children and in developing prescriptive activity plans. P, CDFR 271 or equivalent.

472 Student Teaching in Preschool Programs I By Reservation Only 4(1,10) FSSu
Planning and conducting various phases of early childhood programs. Student takes increasing responsibility, finally taking complete charge of the program. Weekly conferences. P, grade of "C" in 211, 271, 362.

473 Student Teaching in Preschool Programs II By Reservation Only 4(1,10) FSSu
Should be taken concurrently with CDFR 472, or in consecutive semester. P, 472.

491 Independent Study 1-4 credits
Individual study for qualified students. P, consent.

494 Practicum in Child and Family Services 4-12 credits
Field experience with agencies delivering social services to children and families. Apply to department head.

Graduate Courses

502-602 Seminar 1-2(1-2,0) (On sufficient demand)
Reports and discussions of current literature, including research methodology in human development, personality, family relations, marriage and family counseling. Maximum of 4 credits may be applied on advanced degree. P, consent.

544-644 American Woman Roles and Relationships 2(2,0) S (On sufficient demand)
Recent literature regarding changing role of woman, her developmental tasks and unique contribution she has to make in dynamic 20th century America.

576-676 Early Childhood Education, Administration and Practicum 2-4 (On sufficient demand)

577-677 Child and Family Counseling 3(3,0) F
Theory and philosophy of counseling with children and their families. P, consent.

582-682 Special Problems in Human Development and Family Relations 2-4 credits as arranged
Individual study for qualified students. P, consent.

Civil Engineering (CE)

College of Engineering

Professor Rollag, Head; Professors Dornbush, Hassoun, Johnson, Koepsell, Larson, Prasuhn; Associate Professors Selim, Shafi, Sigl, Tiltrum, Zebarth; 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 14 credits of non-technical, and 8 credits of technical electives must be approved by the department head. Humanistic and social science electives must be chosen to satisfy the University Core. 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.

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).

A student with a well defined plan of substitutions which prepares for a specific goal of employment or practice may request such substitutions at the beginning of the Junior Year. This program of substitutions must be approved by your advisor and the department head.

The department will assist those interested to arrange cooperative work-study programs, after the freshman year, with consulting and testing firms, governmental agencies and industry. Credit may be obtained for the work experiences by prior arrangement, by registering for CE 494 Cooperative Education/Internship/Field Experience. These credits will not apply toward the B.S. degree in civil engineering, but will be part of your academic record.

Curriculum in Civil Engineering

(Accredited by the Accreditation Board for Engineering and Technology)

Freshman Year	**F**	**S**
Mathematical Analysis I-II, Math 123-224	5	4
Gen Chem, Chem 110 or 112	4	
Fr Comp, Engl 101 or 191 and Fund of Speech, SpCm 101	3	3
Fitness and Lifetime Activities, PE 100	1	1
Orientation for Engineers, GE 110	0	
Engineering Design Graphics, I-II, EG 121-122	2	2
Gen Chem or Elementary Organic Chem, Chem 114 or 120		3
Elementary Survey, CE 106		3
	15	16

Sophomore Year	**F**	**S**
Math Analysis III, Math 225	3	
Differential Equations, Math 321 or Math. Stat. 381		3
Statics, EM 221	3	
Engineering Surveys, CE 208	3	
Prin of Economics I, Econ 201	3	
Materials, CE 216		3
Dynamics, EM 222		3
Intro to Literature, Eng 218		3
Gen Physics, Phys 211, 213	4	
Computer Programming, CSc 312	2	
	18	15

Junior Year	**F**	**S**
Fluid Mechanics, EM 331	3	
Mech. of Materials, EM 321	3	
Structural Materials Lab, CE 311	1	
Junior Comp, Engl 300 or Adv. Exposition, Engl 303	3	

Transportation Engineering, CE363	2	
Seminar, CE 393	0	
Structural Theory, CE 353		3
Geology, PS 243		3
Thermodynamics, ME 314		3
Basic Electrical Engineering I, EE 305		3
Water Supply Engineering, CE 327		4
Elective	5	2
	17	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 **23**

Technical Electives	**Credits**
General Microbiology, Micr 231	4
Sanitary Engineering, CE 247	3
Environmental Engineering, CE 523	3
Industrial Waste Treatment, CE 524	3
Environmental Engineering Planning, CE 525	3
Water Quality Analysis, CE 526	3
Water Treatment Plant Design, CE527	3
Wastewater Treatment Plant Design, CE 528	3
Hydrology, CE 333	2
Open Channel Hydraulics, CE 533	3
Fluvial Hydraulics, CE 534	3
Water Resources Engineering, CE 535	3
Hydraulic Design, CE 537	3
Advanced Hydraulics, CE 538	3
Foundations, CE 536	3
Advanced Soils Engineering, CE 546	3
Plastic Design, CE 551	2
Prestressed Concrete, CE 552	3
Indeterminate Structural Analysis, CE 457	3
Advanced Structural Mechanics, CE 559	3
Highway Engineering, CE 467	3
Pavement Design, CE 563	3
Construction Engineering, CE 473	3
Construction Methods and Equipment CE 474	3
Photogrammetry, CE 306	3
Land Surveying, CE 304	3

Undergraduate Courses

106 Elementary Surveying 3(1,6) FS
Use, adjustment, and care of surveying instruments; analysis of errors in observation. P, Math 120 or 113 and EG 121.

201 Topographic and Route Surveying 2(0,6) S
(For non-civil engineering students.) Field and office work involved in topographic mapping, fundamentals of aerial photographs; elementary curve theory. P, 106.

208 Engineering Surveys 3(1,6) FSu
Topographic surveys and mapping elements of photogrammetry, land and construction surveys, principles of curve and earth work calculations and other advanced topics in surveying. P, 106.

211 Materials of Construction 2(0,6) F
(For non-civil engineering students.) Sources, applications, and properties of materials used in construction. Laboratory tests to determine these properties. P, sophomore standing.

216 Materials 3(2,3) FS
Basic structure of materials and its effect on material properties. Laboratory tests on materials, principles of concrete mixes. P, Phys 211.

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, EM 331, or consent.

331 Fluid Mechanics Lab 1(0,3) FS
Measurement of properties of common fluids, and tests on fluids in motion. Concurrent with 433.

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

353 Structural Theory 3(3,0) FS
Reactions, internal forces, use of influence lines for beams, frames, and trusses for moving loads. P, EM 321.

363 Transportation Engineering 3(3,0) F
Engineering principles in various common means of transportation. P, 208, and CSc 312.

303 Seminar 0(1,0) FS
Current literature on professional and technical aspects of Civil Engineering. P, junior standing.

412 Computer Applications to Civil Engineering 3(2,3)
A comprehensive use of the computer as a tool in design and analysis of alternative solutions in the field of civil engineering. P. CSc 312 and Senior standing.

423 Waste Water Engineering 3(3,0) FS
Systems for collecting waste water, waste water disposal and treatment processes, solid waste disposal. P, 327.

427 Sanitary Engineering 3(1,6) S
Analysis of water and waste water, design problems in water and waste water facilities. P, 423.

433 Hydraulic Engineering 3(3,0) F
Development of fundamental principles related to closed conduit flow, flow in open channels, open channel transitions and controls, introduction to wave mechanics, hydraulic structures. P, EM 331.

446 Soils Engineering 4(3,3) F
Soil principles, index properties, moisture density relations, compressibility, stresses, embankments, foundations, soil compaction and stabilization, laboratory tests on fundamental soil properties. P, 216.

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) S
Principles for reinforced concrete structures including both working stress and ultimate stress methods, P, CE 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. CE 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. CE 456.

467 Highway Engineering 3(2,3) S
Highway administration and finance, traffic characteristics, highway standards, drainage, geometric design, construction methods. P, 363.

473 Construction Engineering 3(2,3) S
Construction management, equipment, operations, and costs.

474 Construction Methods and Equipment 3(3,0) 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 Special Problems 1-3 FSSu
Individual investigation. P, consent.

494 Cooperative Education/Internship/Field Experience 1-6 FSSu
Planned and supervised professional experience related to civil engineering which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

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

Graduate Courses

511-611 Bituminous Materials 3(2,3)
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, CE 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.

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 equivalent.

525-625 Environmental Engineering Planning 3(3,0) S
Analysis and review of basic concepts and procedures involved in environmental aspects of planning. Consideration given to local effects of projects, as well as effects on area and state or region. P, graduate standing or consent.

526-626 Water Quality Analysis 3(1,6) F
Chemistry and interpretation of process control tests for the use and treatment of water and waste water. Application of test results to the design of water and waste water treatment works. P, 327.

527-627 Water Treatment Plant Design 3(1-6) F
Water supply sources, design of treatment plants, cost estimates of water supply systems. P, graduate standing.

528-628 Waste Water Treatment Plant Design 3(1,6) S
Design of waste water collection and disposal facilities, waste treatment plants, cost estimates of waste disposal and treatment systems. P, graduate standing.

533-633 Open Channel Hydraulics 3(3,0) F
Energy and momentum principles in open channel flow, flow resistance, flow in uniform and non-uniform channels, flood routing. P, 433.

534-634 Fluvial Hydraulics 3(3,0) S
Erosion, transportation, and deposition of sediments by flowing water, bed load and suspended load movement, river behavior and control. P, 433.

535-635 Water Resources Engineering 3(3,0) S
Topics related to water resources engineering including: Multiple purpose river development, economic analysis of flood control measures, aspects of water law, advanced topics related to surface and ground water hydrology and administrative aspects of water resources planning. P, 433.

536-636 Foundation Engineering 3(3,0)
Bearing capacity, load induced pressures and settlements, soil exploration and sampling, lateral earth pressure, retaining walls, sheet pile structures, pile formations and cassions. P, 446.

537-637 Hydraulic Design 3(3,0) F
Hydraulic design as applied to hydroelectric power development and turbine design, flood routing in reservoirs and natural channels, design of drainage structures and energy dissipator. P, 433.

538-638 Advanced Hydraulics 3(2,3) S
Introduction to topics related to water resources engineering including: dimensional analysis, similitude, mechanics of sediment transport, river engineering, coastal hydraulics and stream channel mechanics. P, 433.

546-646 Advanced Soils Engineering 3(2,3) S
Application to engineering problems. Stability, compaction, embankments, seepage, draining, stabilization. P, 446.

551-651 Plastic Design 2(0,6) F
Modes of failure, plastic hinges, design rules and applications. P, 455.

552-652 Prestressed Concrete 3(3,0) Su
Theory and design of prestressed concrete including pre-tensioning and post-tensioning. P, 456.

554-654 Advanced Design of Steel Structures 3(3,0) Alternate years
Design of slender compression elements, tapered members, hybrid plate girders, column base plates subjected to bending moments, bolted and welded connections. Cold formed steel structures. P, CE 455.

556-656 Advanced Reinforced Concrete Design 3
Design of rigid frames, effect of plastic behavior, details for complex structures, analysis of flat plate floor systems. Design comparisons.

557-657 Matrix Analysis of Structures 3(3,0)
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.

559-659 Advanced Structural Mechanics 3(2,3) S
Matrix methods, arches and rings, buckling, structural dynamics, computer solutions. P, 353, 455.

563-663 Pavement Design 3(3,0) S
Stresses in and design of flexible and rigid pavements including subgrades, bases and sub-bases. P, 363.

569-669 Design of Steel and Concrete Bridges 3(3,0) Alternate years
Determination of bridge loadings and bearings. Design of concrete and steel bridge systems. Specifications and detailing related to bridge design. P, CE 455, CE 456.

590-690 Special Engineering Problems 1-3 FS
P, Graduate standing or consent.

595-695 Special Topics 1-3 FSSu
P, Graduate standing or consent.

723 Advanced Sanitary Engineering 3(3,0)

733 Water Resources Engineering 3(3,0) S

763 Highway Administration and Economy 3(3,0)

764 Advanced Transportation Engineering 3(2,3)

790 Thesis 5-7 FSSu

Computer Science (CSc)

College of Engineering

Professor Storry, Acting Head; Associate Professor Lundberg; Assistant Professors Greve, Hovland; Instructors Johnson, Jorgenson.

The department offers a major and a minor in Computer Science.

Computer Science courses are available for students enrolled in all colleges, provide information about computers — how they are used and how they affect our daily lives, as well as how to program them.

Computers are becoming an important part of many disciplines within the university, and graduating students often find that computer programming experience is a most valuable asset, since organizations of all types now use computers. Many educators feel that familiarity with computers should be expected of every educated person.

Programming courses make use of the facilities of the Computing Center, which include a large capacity, high speed IBM computer and other equipment necessary for program preparation.

Minor in Computer Science

Course	Credit
Statistical Methods I, Stat 341	3
or Mathematical Statistics, Math 381	3
Computer Programming, Data Processing, CSc 271	4
or Computer Programming, CSc 312	2
Plus 12 hours of any CSc 300 or 400 level courses, except 311 and 312 Linear Algebra, Math 315	3
Intro to Numerical Computation, Math 373	3
Numerical Analysis, Math 571	3

112 Programming with BASIC 2(0,2) FS
Fundamentals of the BASIC programming language and an introduction to computer solution of problems. Terminals are used to enter and run a number of simple BASIC programs. P, high school algebra.

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

212 Computer Programming 1(0,2) FS
Introduction to FORTRAN programming. P, Math 111 or 113.

271 Computer Programming, Data Processing 4(3,2) S
Gives non-engineers an appreciation of the use of computers. FORTRAN programming, flow charting, data processing techniques, evaluation of computer hardware, binary arithmetic, elementary numerical analysis and optimization applications. P, Math 111 (with C or better) or equivalent.

311 Introduction to Computers and Programming 3(2,2) S
History, operating principles and applications, as well as BASIC programming. P, Math 111 or 113.

312 Computer Programming 2(1,2) F
FORTRAN programming with emphasis on numerical methods of problem solution. P, Concurrent enrollment in Math 224.

313 COBOL Programming 3(2,2) F
Data processing applications of computers. An introduction to COBOL programming. Several COBOL programs are written and run on the IBM/370 computer. The student is also given a brief introduction to RPG programming and 1 or 2 programs are run. P, FORTRAN programming or consent.

314 Computer Operation 3(2,2) S
ASSEMBLY language programming, organization and operating principles of the IBM 370 computer, and others. For students seriously interested in computers or computer programming. P, CSc 212, 271, 311, or 312.

316 Computer Languages 3(2,2) S
Introduction to PL/I and data structures. Advanced FORTRAN topics. P, 212, 271 or 312.

354 Introduction to Systems Programming 3(3,0) S
Advanced assembly language programming and an introduction to operating system services and systems control data areas. P, CSc 314.

361 Computer Information Systems 3(3,0)
Introduction to Data Base and Management Information Systems. Programs written and run on IBM/370 computer. P, COBOL or ASSEMBLY language programming.

391 Special Topics in Computer Science 1-3 credits
Individualized problems determined by mutual agreement between instructor and student. Programming language optional. P, consent of instructor.

425 Microcomputer Applications 3(2,3)
See ECom 425. (Electrical Engineering).

426 Computer Architecture and Organization 3(3,0)
See ECom 426. (Electrical Engineering).

525-625 Digital Systems Hardware Design 3(3,0)
See ECom 525-625. (Electrical Engineering).

456 Operating Systems 3(3,0) F
Operating systems structure; memory, process and I/O management; concurrent processes and case studies of existing operating systems. P, CSc 314 and Stat 341 or 381.

494 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.

540-640 Computer Graphics 3(3,0)
A survey of modern topics in man-machine communication via imagery. Topics include display hardware, various plotter software packages, visual presentation of data. P, CSc 312 or consent of instructor.

Counseling, Guidance, and Personnel Service (CGPS)

(See Education)

Dairy Science (DS)

College of Agriculture and Biological Sciences

Professor Parsons, head; Professors Baker, Schingoethe, Spurgeon, Voelker; Associate Professors Bartle (Emeritus), Owens, Seas; Assistant Professors ClarK, Gilmore

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 Beachelor of Science Degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	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
Intro to Sociology, Soc 100			3
Fund of Speech, SpCm 101	3	or	3
Humanities Elective	2		
Elective			2

Sophomore Year	**F**	**S**
Algebra, Math 111	3	
Trigonometry, Math 120		3
Gen Microbiology, Micr 231		4
Elementary Physics, Phys 111, 113 or General Physics, Phys 211-213	4	4
Organic Chem, Chem 120, 222 or 326	4-5	
Elementary Biochemistry, Chem 260		4
Dairy Products Judging, DS 202		1
Social Science Elective	3	
Humanities Elective	2	

Junior & Senior Years	**F**	**S**
Junior Comp, Engl 300	3	
Communications elective†		2
Food Microbiology, Micr 311	3	
Processing Equipment for Ag Products, MA 443	3	
Prin of Econ I, Econ 201	3	
Prin of Accounting I, Actg 210		3
Labor, Law & Econ, Econ 382	3	
Genetics, Bio 371	3	
Dairy Microbiology, DS 301		3
Dairy Product Processing I-II, DS 321, 322	5	5
Technical Control of Dairy Products I, II, DS 221, 422	3	4
Dairy Plant Management, DS 421	3	
Dairy Seminar, DS 400	1	
Dairy Production elective		2-3
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 or 191	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		
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**
Prin of Econ I, Econ 201	3	
Social Science Elective	3	
Intro Biology, Bio 151, 152	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	3	
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 400	1	
Dairy Production elective		2-3
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 or 191	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
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**
Prin of Econ I, 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
Dairy Foods, DS 231	3	
Animal Diseases & Their Control, Vet 403	3	
Genetics, Bio 371	3	
Anatomy & Physiology of Livestock, Vet 223		4
Prin of Animal Breeding, AS 332		4
Dairy Seminar, DS 400	1	
Dairy Farm Management, DS 412	3	
Dairy Cattle Feeding, DS 432		3
Livestock Reproduction, AS 433	3	
Humanities Electives	3	3
Electives		10

The following options, for the curricula in Agriculture, have these requirements in addition to those listed above.

Business Option

Prin of Econ II, Econ 202 (3); Prin of Accounting I, Actg 210 (3); Business Management B-Ad 360 (3); Plus 12 hours to be chosen from: Prin of Accounting II, Actg 211 (3); Personal Finance, B-Ad 280 (3); Business Law I, B-Ad 350 (3); Business Law II, B-Ad 351 (3); Marketing, Econ 353 (3); Money & Banking, Econ 330 (3); Statistics I, Stat 341 or equivalent (3); Business Finance, B-Ad 310 (3); Marketing Management, Econ 452 (3); Agricultural Marketing, Ag Ec 354.

Science Option

Chemistry, Mathematics and/or Physics (11); Biological Science to be selected from the following areas: Botany, Entomology-Zoology or Plant Pathology (2)

Specialized Teaching Option*	**Credits**
All Dairy Production Courses**	
Education Psychology, EPsyc 302	2
Teaching of Reading, SeEd 450	3
Indians of North America, Anth 421 or History of Am Indians, Hist 368	3
Prin of Vocational Education & Practical Arts, VTTE 405	2
Seminar in Ag Ed, AgEd 301 or Coop Educ/Internship/Field Experience, AgEd 494	1
Program Planning in Vo Ag, AgEd 434	3
Teaching Ag Mechanics, AgEd 454	2
Student Teaching Ag Ed, AgEd 475	8
Welding, ES 131	2
Mechanized Ag electives†	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.
**General Psychology, Psyc 101 must be taken as the Social Science elective.
†To include 6 credits from MA 202, 213, 333, 342, 423, 433 and 463.

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 (1983)
Quality control problems during the production and processing of fluid milk for human use, including role of regulatory agencies and quality standards. P, Micr 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 (1983)
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 desirable.

322 Dairy Product Processing II 5(4,3) S 1984)
Processing or manufacturing of relatively nonperishable dairy products such as butter, cheese, dried milk, casein, lactose, and anhydrous milkfat. P, 321.

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

401 Advanced Dairy Products Judging 1(0,3) F
Quality evaluation of dairy products. Usually includes participation in national collegiate dairy products contest. P, 202. Maximum of 2 credits.

411 Dairy Breeds & Breeding 2(2,0) S (1984)
Origin, genetics, characteristics, and development of major breeds of dairy cattle. Breeding and selection based on pedigrees, production records, type classification, and sire analysis. P, 130.

412 Dairy Farm Management 3(3,0) F (1983)
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, junior standing or consent.

421 Dairy Plant Management 3(3,0) F (1982)
General costs, buildings, equipment, merchandising, personnel, other management factors of dairy processing plants. P, junior standing or consent.

422 Technical Control of Dairy Products II 4(3,3) S
Physical and chemical properties of milk constituents and their effect on processing, testing, and nutritive value of milk and its products. Intentional or accidental additives, their effect and significance. Laboratory tests for process control or legal compliance. P, 221, Chem 120 or equivalent.

432 Dairy Cattle Feeding 3(3,0) S (1983)
Practical considerations involved in feeding dairy cattle. P, 130, AS 223.

490 Special Problems in Dairy Science 1-3 (As arranged) FSSu
Investigation of problems in dairy production of dairy manufacturing. Results to be submitted as a technical paper. P, Junior or Senior standing plus consent. Maximum of 3 cr. for B.S. degree.

494 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 (1983)
Anatomy and physiology of mammary glands. Factors affecting quality and quantity of milk. P, Zool 223 or equivalent.

522-622 Advanced Dairy Microbiology 3(2,3) S (1984)
Role of microorganisms in manufacture and spoilage of manufactured dairy products. P, 301 or Micro 311.

531-631 Laboratory Techniques in Dairy Science 2(0,6) F (1982)
Current research techniques including photometry; electrophoresis; and column, thin-layer, and gas chromatography of milk and plant or animal tissues. P, Chem 260 and consent.

590-690 Dairy Science Problems 1-3 FSSu
Investigation of problems in dairy production or dairy manufacturing. Results submitted as a technical paper. P, consent.

702 Seminar 1(1,0) S
711 Ruminology 3(3,0) F (1983)
782 Nutrition Seminar 1(1,0) F
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 Thompson, head; Professors Aanderud, Allen, Gilbert, Greenbaum, Hall, Hsia, Kim, Murra, Taylor; Professors Emeriti Helfinstine, Kohlmeyer, Myers, Smythe; Associate Professors Dobbs, Felberg, Hanson, Kamps, Kelsey, Lamberton, Lundeen, Lyons, Peterson, Sogn; Assistant Professors Edelman, Ellingson, Goodenow, Janssen, Shane; Instructor 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.

Teaching and research activities become current, meaningful, and important when they apply economic principles and analysis to problems such as farm and ranch management, marketing agricultural products, community development, irrigation feasibility, taxation, or strengthening business and community services.

Two curricula leading to the Bachelor of Science degree are offered in the College of Agriculture and Biological Sciences.

A student wanting to prepare for a career in a business or industry related to agriculture should carefully consider the curriculum in Agricultural Business.

The curriculum in Agricultural Economics may be used to prepare for agricultural research, government employment, or graduate study.

Students whose goals require little emphasis upon technical agriculture may consider the curricula offered in the College of Arts and Sciences, where two options are offered within each of two degree programs. The Bachelor of Science and the Bachelor of Arts degrees include options in Commercial Economics and General Economics.

Commercial Economics is designed for those going into management positions with businesses but who want strength in economic analysis.

The General Economics option is appropriate for those planning careers with government agencies or in research-oriented jobs and those going on to graduate study.

Reasonable substitutions within the spirit of these curricula may be made at the students' request by the Economics Department, with the approval of the dean. Evidence, based upon vocational goal an needs, may be required.

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

Freshman Year	**F**	
Fr Comp, Engl 101 or 191	3	or
Fund of Speech, SpCm 101	3	or
Fitness & Lifetime Activities, PE 100	1	
Intro to Sociology, Soc 100	3	
Gen Chem, Chem 110 or 112	4	
Intro Physics, Phys 101 or Elementary Physics, Phys 111, or Gen Physics, Phys 211		
Group I electives[2]	3	
Algebra, Math 111		
General electives	1	
	15	

Sophomore Year	**F**
Macroeconomic Principles, Econ 201	3
Microeconomic Principles, Econ 202	
Money & Banking, Econ 330	
Humanities electives[3]	3
Biological Science elective[3]	
Prin of Accounting I, Actg 210	3
Group I electives[2]	3
Farm and Ranch Management, AgEc 271	4
Calculus for Non-Math Majors, Math 222	
	16

Junior Year	**F**
Junior Comp, Engl 300	3
Advanced Exposition, Engl 303	
Intermediate Microeconomics, Econ 301	3
Intermediate Macroeconomics, Econ 302	
Statistical Methods I, Stat 341	3
Computer Programming Data Processing, Csc/Math 271	4
Agri Marketing, AgEc 354	
Business Law I, B-Ad 350	
General electives	3
	16

Senior Year	**F**
Communications elective[4]	2-3
Public Finance, Econ 433	3
Operations Research, B-Ad 326	4
One of the following: Comparative Econ Systems, Econ 405; History of Econ Thought, Econ 504; or Econ History of the US, Hist 377	3
Managerial Economics, Econ 427	
Ag Finance & Appraisal, AgEc 478	
Agri Policy, AgEc 479	
Prin of Accounting II, Actg 211	3
One additional course prefixed AgEc	
Social Science Elective[5]	
General electives	0-1
	16

[1] **Agricultural Finance Specialization.** Students wishing to specialize in Agricultural Finance sh consult with the Economics Department as soon as possible. Suggested courses for such a specializ include AgEc 478 and 479, B-Ad 310, AgEc 354, Math 241, and additional technical agriculture cou
[2] Group I electives are listed on page 30.

[3]Humanities, Social Science, and Biological Science electives chosen from the list on pages 11-13. Biological science electives must be chosen from Biology, Botany, Entomology, Microbiology, and Zoology.
[4]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.
[5]General elective for students who elected to take Hist 377 above.

Curriculum in Agriculture, Agricultural Economics Major

Leading to the Bachelor of Science Degree

Freshman Year	F		S
Fr Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities PE 100	1		1
Intro to Sociology, Soc 100	3		
Gen Chem, Chem 110 or 112	4		
Intro Physics, Phys 101, Elementary Physics, Phys 111; or Gen Physics, Phys 211			4
Group I elective[1]			2
Biological Science elective[2]	3		
Algebra, Math 111	3		
General elective	1		3
	15		16

Sophomore Year	F	S
Macroeconomic Principles, Econ 201	3	
Microeconomic Principles, Econ 202		3
Money & Banking, Econ 330		3
Humanities electives[2]	3	3
Prin of Accounting I, Actg 210	3	
Farm and Ranch Management, AgEc 271	4	
Calculus for Non-Math Majors, Math 222		5
Group I electives[1]	3	3
	16	17

Junior Year	F	S
Junior Comp, Engl 300	3	
Advanced Exposition, Engl 303		3
Intermediate Microeconomics, Econ 301	3	
Intermediate Macroeconomics, Econ 302		3
Statistical Methods I, Stat 341		3
Computer Programming and Data Processing, CSc/Math 271	4	
Ag Finance and Appraisal, AgEc 478		4
Agricultural Marketing, AgEc 354	3	
General electives	3	3
	16	16

Senior Year	F	S
Communications elective[3]	2-3	
Public Finance, Econ 433		3
One of the following: Comparative Econ Systems, Econ 405; History of Econ Thought, Econ 504; or Econ History of U.S., Hist 377		3
Production Econ, AgEc 421	3	
Ag Policy, AgEc 479		3
Mathematical Economics, Econ 428		3
Social Science elective[4]	3	
Statistics II, Econ 423	3	
General electives	4-5	4
	16	16

[1]Group I electives are listed on page 30.
[2]Humanities, Social Science, and Biological Science electives chosen from the list on pages 11-13.
[3]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; & Magazine Writing & Editing, MCom 315.
[4]General elective for students who elected to take Hist 377 above.

Curriculum in Arts and Science, Economics Major Commercial Economics Option

Leading to the Bachelor of Arts Degree

Freshman Year	F		S
Fr Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Foreign Language[1]	4		4
Natural Science electives,[2] including 3 hrs. lab science	3		3
Social Science elective[2]			3
Algebra, Math 111	3		
General electives	2		2
	16		16

Sophomore Year	F	S
Macroeconomic Principles, Econ 201	3	
Microeconomic Principles, Econ 202		3
Money & Banking, Econ 330		3
Foreign Language[1]	3	3
Prin of Accounting I, Actg 210	3	
Humanities elective[2]		4
Computer Programming & Data Processing, CSc/Math 271		4
Calculus for Non-Math Majors, Math 222	5	
General elective	1	
	15	17

Junior Year[3,4]	F	S
Junior Comp, Engl 300	3	
Advanced Exposition, Engl 303		3
Intermediate Microeconomics, Econ 301	3	
Intermediate Macroeconomics, Econ 302		3
Statistical Methods I, Stat 341	3	
Prin of Accounting II, Actg 211		3
Social Science elective[2,6]		3
Marketing, Econ 353	3	
Humanities electives[2]	3	5
	15	17

Senior Year	F	S
Public Finance, Econ 433	3	
Business Finance, B-Ad 310		3
Business Management, B-Ad 360		3
Business Law I, B-Ad 350		3
Managerial Economics, Econ 427		3
Communications elective[5]	2-3	
Operations Research, B-Ad 326	4	
One of the following: Comparative Econ Systems, Econ 405; History of Econ Thought, Econ 504; or Econ History of U.S., Hist 377	3	
Electives in Actg, AgEc, B-Ad, or Econ	3	3
General electives	0-1	1
	16	16

[1]Two years of one foreign language (French, German, Spanish)
[2]Natural Science, Social Science, and Humanities electives chosen from the list on pages 11-13.
[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, MCom 315.
[6]General elective if Hist 377 is elected in the choice above.

Curriculum in Arts and Science, Economics Major
Commercial Economics Option

Leading to the Bachelor of Science Degree

Freshman Year	F		S
Fr Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Physical Science electives[1]	4		4
Social Science elective[1]			3
Algebra, Math 111	3		
General electives	5		5
	16		16

Sophomore Year	F	S
Macroeconomic Principles, Econ 201	3	
Microeconomic Principles, Econ 202		3
Money & Banking, Econ 330		3
Biological Science electives[2]	3	3
Prin of Accounting I, Actg 210	3	
Computer Programming & Data Processing CSc/Math 271		4
Calculus for Non-Math Majors, Math 222	5	
General electives	4	2
	16	16

Junior Year[2,3]	F	S
Junior Comp, Engl 300	3	
Advanced Exposition, Engl 303		3
Intermediate Microeconomics, Econ 301	3	
Intermediate Macroeconomics, Econ 302		3
Statistical Methods I, Stat 341	3	
Prin of Accounting II, Actg 211		3
Social Science elective[1,5]		3
Marketing, Econ 353	3	
Humanities electives[1]	3	5
	15	17

Senior Year	F	S
Public Finance, Econ 433	3	
Business Finance, B-Ad 310		3
Business Management, B-Ad 360		3
Business Law I, B-Ad 350		3
Managerial Economics, Econ 427		3
Communication elective[4]	2-3	
Operations Research, B-Ad 326	4	
One of the following: Comparative Econ Systems, Econ 405; History of Econ Thought, Econ 504; or Econ History of U.S., Hist 377	3	
Electives in Actg, AgEc, B-Ad, or Econ	3	3
General electives[4]	0-1	1
	16	16

[1]Physical and Biological Science, Social Science, and Humanities electives chosen from the list on pages 11-13.
[2]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.
[3]All students must complete a minimum of 40 semester hours in courses numbered 300 or above to qualify for the degree.
[4]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.
General elective if Hist 377 is elected in the choice above.

Curriculum in Arts & Science, Economics Major
General Economics Option

Leading to the Bachelor of Arts Degree

Freshman Year	F		S
Fr Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Foreign Language[1]	4		4
Natural Science elective[2] (lab science)	3		
Algebra, Math 111	3		
General electives	2		8
	16		16

Sophomore Year	F	S
Macroeconomic Principles, Econ 201	3	
Microeconomic Principles, Econ 202		3
Money & Banking, Econ 330		3
Foreign Language[1]	3	3
Prin of Accounting I, Actg 210	3	
Computer Programming & Data Processing, CSc/Math 271		4
Calculus for Non-Math Majors, Math 222	5	
General electives	2	
	16	16

Junior Year[3,4]	F	S
Junior Comp, Engl 300	3	
Advanced Exposition, Engl 303		3
Intermediate Microeconomics, Econ 301	3	
Intermediate Macroeconomics, Econ 302		3
Statistical Methods I, Stat 341	3	
Humanities electives[2]	4	4
Social Science electives[2,6]	3	3
General elective		3
	16	16

Senior Year	F	S
Public Finance, Econ 433	3	
Communications elective[5]	2-3	
One of the following: Comparative Econ Systems, Econ 405; History of Econ Thought, Econ 504; or Econ History of the U.S., Hist 377	3	
Humanities electives[2]		4
Statistics II, Econ 423	3	
Mathematical Economics, Econ 428		3
Electives in Actg, AgEc, B-Ad, or Econ	3	6
General electives	1-2	3
	16	16

[1]Two years of one foreign language (French, German, Spanish).
[2]Natural Science, Social Science, and Humanities electives chosen from the list on pages 11-13.
[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]Three hours of this requirement is a General elective if Hist 377 is elected in the choice above.

Curriculum in Arts & Science, Economics Major General Economics Option

Leading to the Bachelor of Science Degree

Freshman Year	F		S
Fr Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Physical Science electives[2]	4		4
Algebra, Math 111	3		
General electives	4		8
	15		16

Sophomore Year	F	S
Macroeconomic Principles, Econ 201	3	
Microeconomic Principles, Econ 202		3
Money & Banking, Econ 330		3
Biological Science electives[1]	3	3
Prin of Accounting I, Actg 210	3	
Computer Programming & Data Processing, CSc/Math 271		4
Calculus for Non-Math Majors, Math 222	5	
Social Science elective	3	
General elective		3
	17	16

Junior Year	F	S
Junior Comp, Engl 300	3	
Advanced Exposition, Engl 303		3
Intermediate Microeconomics, Econ 301	3	
Intermediate Macroeconomics, Econ 302		3
Statistical Methods I, Stat 341	3	
Humanities electives[1]	4	
Social Science elective[1,5]		3
General electives[3]	3	7
	16	16

Senior Year	F	S
Public Finance, Econ 433		3
Communications elective[4]	2-3	
One of the following: Comparative Econ Systems, Econ 405; History of Econ Thought, Econ 504; or Econ History of the U.S., Hist 377	3	
Humanities electives[1]		4
Statistics II, Econ 423	3	
Mathematical Economics, Econ 428		3
Electives in Actg, AgEc, B-Ad or Econ	6	3
General electives[3]	1-2	3
	16	16

[1] Natural, Biological, Physical and Social Science and Humanities electives chosen from the list on pages 11-13.
[2] 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.
[3] All students must complete a minimum of 40 semester hours in courses numbered 300 or above to qualify for the degree.
[4] 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; Magazine Writing & Editing, MCom 315.
[5] General elective if Hist 377 is elected in the choice above.

Students wishing to take a major in Economics with emphasis on mathematics and statistics should consult adviser.

Minor: Econ 201, 202, Stat 341 and one course selected from Econ 301, 302, and 330 plus two additional courses prefixed AgEc, Econ, or Stat.

Courses in the economics department are offered in the following areas: Accounting (Actg), Agricultural Economics (AgEc), Business Administration (B-Ad) and Economics (Econ).

Accounting (Actg)

Undergraduate Courses

210 Prin of Accounting I 3(3,0) FS

Basic accounting cycle; financial statements; asset valuation; accounting controls and concepts, payrolls, payroll taxes and an introduction to the corporate capital accounts. Understanding of fundamental procedure and accounting theory.

211 Prin of Accounting II 3(3,0) FS

Accounting for partnerships and corporations; an introduction to cost accounting, budgeting, and other accounting reports for management, creditors, and investors. P, 210.

Agricultural Economics (AgEc)

Undergraduate Courses

271 Farm & Ranch Management 4(3,2) FS

Farm or ranch business from viewpoint of continuous profit and efficiency. Basics of farm management applied to selection and combination of enterprises, level of production, size of business, labor efficiency, and machinery efficiency. Types of farming, tenure and leasing, risk, prices, credit and starting farming. Business and production records, their analysis and use in budgeting and planning future operations. P, Math 111.

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

Principle factors which affect the supply, demand and prices of agricultural commodities. Market information in forecasting price trends. Evaluation of alternate marketing strategies, e.g., futures trading, other forward pricing instruments. Alternative agricultural marketing institutions. P, 201 or 202.

421 Production Economics 3(3,0) F

Input-output analysis involving single and multiple input and products; types of production functions; technological changes; short run vs. long run supply; returns to scale and size; decision theory. P, Econ 202 and Math 222 plus B-Ad 326 and Econ 301 recommended.

452 Marketing Management 3(3,0) F

(Offered on demand) Role of cooperatives in marketing. Present organization and emerging developments in agricultural or industrial input and product markets. Marketing alternatives for producers of agricultural and industrial products. Introduction to international marketing. P, 353 or AgEc 354.

478 Ag Finance & Appraisal 4(3,2) 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. Farm real estate appraisal methods. Half day field trips required. P, 271 and Econ 202. Econ 330, recommended.

479 Agricultural Policy 3(3,0) S

Economic policies affecting agricultural prosperity, with special emphasis on farm programs, food assistance programs, agricultural trade, finance, bargaining and other institutional forces affecting agriculture and agri-business. Implication of agricultural policy alternatives on people living in rural and urban areas. P, 201, 202.

490 Ag Econ Problems 1-3(1-3,0) FS

Individual study of special topics or problems of concern to agriculture and agri-business. May involve case studies, special readings, and reports. Maximum of 4 hours. P, consent.

Graduate Courses

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

(Offered in S 1983) The marketing environment; market structure, performance and conduct; measurement and forecasting; pricing problems and policies; financing and risk; marketing alternatives; efficiency; market power; social, legal and ethical issues; marketing and policy. P, 301, Stat 341.

570-670 Advanced Farm & Ranch Management 3(3,0) S

Leasing arrangements, capital investment, computerized accounting and budgeting. Use of linear programming as a tool for planning and organizing the farm business. P, 271, /2 credit hours CSc, and Econ 202 or consent.

590-690 Special Problems 1-3(1-3,0) FS

Advanced work or special problems in agricultural cooperation, agricultural finance, farm management, land economics, marketing, public finance, statistics. Open to qualified senior and graduate students. P, consent.

Business Administration (B-Ad)

Business Area Studies. Students preparing for various positions in management and business should consult the list of courses under BUSINESS AREA STUDIES on page 67. Many of the courses listed there are offered by departments other than the Economics Department including other cooperating public colleges and universities and some are of more specific interest to students in majors outside this department.

Undergraduate Courses

310 Business Finance 3(3,0) FS
Capital and credit needs of business firms; principles and problems in extending and using business credit; analysis of financial statements; financial management; planning and financing capital structure; market for and investing in debt and equity securities. P, Actg 210 or equivalent.

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 contracts, bailments, personal property, torts and criminal law; emphasis is on South Dakota law.

351 Business Law II 3(3,0) FS
Legal rights and duties of parties to business transactions — sales security devices and insurance, partnerships, corporations, real property, estates and bankruptcy. P, 350.

360 Business Management 3(3,0) FS
The process of management, including functions of planning, organizing, directing, controlling, and coordinating. Emphasis is on the business situation. Thus other disciplines such as finance and marketing are discussed as they apply to the basic functions. P, Junior standing or consent.

380 Personal Finance 3(3,0) FS
Survey of individual investment opportunities, including common and preferred stock and corporate bonds; auto, health and life insurance; home ownership; wills and estate planning.

Economics (Econ)

Undergraduate Courses

201 Macroeconomics Principles 3(3,0) FS
Analysis of U.S. economy. Money and banking. Federal Reserve policy, national income, government spending, taxation, business fluctuations, and levels of employment and prices. Introduction to supply and demand, business organization, world trade, economic growth, and economic systems. P, Math 111 or equivalent.

202 Microeconomics Principles 3(3,0) FS
Analysis of price as it allocates resources and distributes income. Theory of firm, supply and demand, economic efficiency, types of competition in markets, marginal productivity and wage determination; public interest in industry, agriculture, labor and individual welfare. P, Math 111 or equivalent.

301 Intermediate Microeconomics 3(3,0) FS
Scope and method of economic analysis. Pricing process under varying degrees of competitive conditions and role of price in allocation of resources. Introduction to theory of income distribution. P, 202, Math 222 or equivalent.

302 Intermediate Macroeconomics 3(3,0) FS
Determinants of national income, employment and price level in free enterprise system with particular attention to aggregate consumption investment and government spending. In addition, there will be brief consideration of methods of maintaining a high level of employment and income and related aspects of economic policy. P, 201, 202, Math 111 or equivalent.

330 Money & Banking 3(3,0) FS
Principles of money, banking, and credit; major types of financial institutions and their significant functions and policies. P, 201 or 202, Sophomore standing.

353 Marketing 3(3,0) FS
Marketing; market organization and the role of cooperative, marketing functions; pricing; efficiency, and role and management of marketing activities in today's business organization. P, 202.

382 Labor, Law & Econ 3(3,0) F
History and development of the U.S. labor movement; the labor market in a market economy from firm's and union's viewpoint; collective bargaining; public policy toward collective bargaining. P, 201 or 202, junior standing.

391 and HE391 Consumer's & 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(2,2) F
Probability, point and interval estimation, tests of hypotheses, multiple regression and correlation, chi-square analysis, and analysis of variance. P, 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, B-Ad 326.

428 Mathematical Economics 3(3,0) S
Study of mathematical methods in introductory calculus and linear algebra and their applications to economic analysis. Mathematical analysis of static and dynamic partial and general equilibrium models, production functions, activity analysis, distribution, cycles, growth, mathematical programming, and model building. P, 301, 302, Math 222 or equivalent.

433 Public Finance 3(3,0) FS
Principles, problems and history of public revenues, public expenditures and public debt management. Problems of attaining an equitable distribution of burdens and benefits. P, 201, 202.

452 Marketing Management 3(3,0) F
(Offered on demand) Role of cooperatives in marketing. Present organization and emerging developments in agricultural or industrial input and product markets. Marketing alternatives for producers of agricultural and industrial products. Introduction to international marketing. P, 353 or AgEc 354.

453 Risk Management — Personal & Business 3(3,0) F
Protection against or adaptation to risk and uncertainty. Includes principles and practices of fire, casualty, surety, and life insurance and other risk management techniques.

490 Economics Problems 1-3(1-3,0) FS
Individual study. May involve case studies, special reports, assigned readings, analysis of data and report preparation. Maximum of 4 hours. P, consent.

491 Special Topics 1-4
Organized by an instructor in consultation with his or her department head and a group of students. The course will provide a medium through which a specific topic can be pursued. The course will normally be experimental and may be a "one shot deal" for a particular semester and the unique group of students. Maximum: 4 hours credit per semester, 7 hours credit per degree.

494 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
Survey of economic theory; various schools of economic thought and economic environments which produced them. P, 301, 302 or consent.

520-620 Economics of the Public Sector 3(3,0) S
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)
(Offered 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 1982, S 1984
The elements involved in market power and how they function. Government regulation of markets. The consumer movement. Grades, brands, advertising and promotion. Current changes in marketing strategies. P, Econ 301 and 302 or consent.

560-660 Economic Development 3(3,0) S1983
Economic development theory, methods of analyzing regional and national development in developing and developed economies. Role of public policy in development process. Agricultural and rural development issues emphasized.

572-672 Resource Economics 3(3,0) F 1983
Economic analysis and planning applied to natural resource use. Environmental economics, energy economics, water and land use, and methods of evaluating projects and programs.

590-690 Special Problems 1-3(1-3,0) FS
Advanced work in special problems in agricultural cooperation, agricultural finance, farm management, land economics, marketing, public finance, statistics. Open to qualified seniors and graduate students by consent.

701 Research Methods 2(2,0) F
702 Seminar in Economics 1(1,0)
703 Advanced Macroeconomics 3(3,0) S
704 Advanced Microeconomics 3(3,0) F
705 Applied Economic Theory
724 Advanced Quantitative Economics 3(3,0) F
790 M.S. Thesis (as arranged)
791 Graduate Special Topics 1-4

Education (Ed)

Division of Education

Professor Jensen, dean; Professors Everrett, Larsen, Lindstrom, Schmieding, Scholten; Professors Emeriti Gadda, Kramer, Sundet; Associate Professors Edeburn, Hanson, Lingren, Menning, Pedersen, Reifschneider, Schultz, Widvey; Associate Professor Emeritus Herold; Assistant Professors Fine, Hofland, Ivers, Madson, Moeller, Pylman, Ristow, Steinley; Instructors Bell, Johnson.

The courses in education are divided into the following areas: Agricultural Education (AgEd), Adult Higher Education (AHEd), Counseling, Guidance and Personnel Services (CGPS), Driver's Education (DrEd), Educational Administration (EdAd), Education, Evaluation and Research (EdER), Educational Foundations (EdFn), Elementary Education (ElEd), Education Psychology (EPsyc), Industrial Arts Education (IA), Secondary Education (Sed), and Vocational Teacher Training Education (VTTE).

Agricultural Education (AgEd)

Associate 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 Board of Vocational Education and by the Division of the Vocational and Technical Education of the U.S. Office of Education. Accordingly, the College of Agriculture and Biological Sciences and the Division of Education cooperate in offering such teacher preparation. Students preparing to teach enroll in all the required core courses in the College of Agriculture. They earn a major in Agricultural Education, with supporting preparation in technical agriculture, basic sciences, and communications skills to make up the total requirement. Teachers of Vocational Agriculture in South Dakota receive the appropriate certificate to teach in high school, issued by the Division of Elementary and Secondary Education. The professional education requirement is 28 semester credits in education including student teaching vocational agriculture. The student teaching is done in designated agriculture departments of high schools in S.D.

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: an all university G.P.A. of 2.0 for admission to education courses, and 2.2 for student teaching; acceptable university entrance test scores. 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 both 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
Biology, Bio 151	3	
General Chemistry, Chem 110	4	
Fr. Comp. Engl 100/Engl 101/Engl 191	3	
College Algebra, Math 111		3
Elective		2
	17	15

Sophomore Year	**F**	**S**
Introductory Physics, Phy 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; Crop & Lvst. Insects, Ent 293 (S); Insect Control Methods, Ent 391 (F); Plant Pathology, PS 223 (F)	(3-4)	(3-4)
Macroeconomic Principles, Econ 201 **OR** Microeconomic Principles, Econ 202	(3)	(3)
Farm Management, Econ 271	4	
Elective	1-2	
	16-18	16-17

Junior Year	**F**	**S**
Humanities Elective*		3
Heredity & Society, Bio 271 **OR** Genetics, Bio 371	2-3	
Farm Power & Machinery, MA 213	3	
Elec. for Farm & Home, MA 342		2
Indians of N. Am., Anth 421 **OR** History of Am. Indians, Hist 368	3	
Animal Nutrition, AS 223		3
Welding, ES 131		2
Seminar in Ag Ed, AgEd 301 **OR** AgEd 494	1	
Prin. of VocEd & Prac Arts, VTTE 405	2	
Educational Psychology, EPsyc 302	2	
Junior Composition, Engl 300		3
Two of the following: Prin. of Accounting I, Actg 210; Ag Marketing & Prices, AgEd 354; Ag Finance & Appsl., AgEc 478 (S) (Econ 202 & 271 Prerequisites) Bus Management, B-Ad 360 Micro or Macro Econ., Econ 201/202	3-4	3-4
	16-18	16-17

Senior Year	F	S
Humanities Elective*	3	
One of the following: Farm Bldg Mech., Ma 423; Ag Waste Mgmt, MA 463 (F); Proc. Eqpt for Ag Prod, MA443 (F); Small Power Eqpt, MA 433 (F)	3	
Teaching of Reading, SEED 450	3	
One of the following: Poultry Management, AS 366 (F); Beef Production, AS 474; Swine Production, AS 478 (S); Sheep & Wool Prod., AS 477 (F)	3	
Anim. Dis & Their Control, VET 403 (F) (Micr 231 Prerequisite)	3	
Publicity methods, Mcom 313 **OR** Advanced Exposition, Engl 303	2	
Spec. Mthds. in AgEd, AgEd 434		3
Program Plan in AgEd, AgEd 404		4
Student Tchg. in AgEd, AgEd 475		8
Teaching Ag Mech, AgEd 454		2
	17	17

Undergraduate Courses

301 Seminar in Agricultural Education 1(1,0) FS
Introduction to vocational education in agriculture. Teaching high school vocational agriculture. Required of AgEd juniors. P, junior standing.

404 Program Planning in AgEd 4(8,0) FS
Future Farmers of America Program, Adult Education, and supervised occupational experience programs; policy development. Offered first half of semester in which student does student teaching and resumed following student teaching. P, senior standing in AgEd.

406 Problems in AgEd 1-3
Selected studies and activities to meet the needs of undergraduate students.

434 Special Methods in AgEd 3(6,0) FS
Aims, course of study selection and organization of subject matter, method in field, laboratory, classroom, and supervised occupational experience programs. Taken first half of semester in which the student does student teaching, and resumed following student teaching. P, AgEd 301, EPsyc 302.

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. Must have GPA of 2.2 or better. 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.

494 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)
Specific problems dealing with instruction in vocational agriculture, project work, course of study, farm enterprise analysis, local survey. Reading and problems work. P, 434, 404, 475.

506-606 Problems 1-3
Selected studies to meet needs of advanced students. P, senior standing, for seniors and graduate students desiring to do individual studies. Limited to 3 credits in graduate program. Consent.

706 Adult Ed in Ag 2(2,0) Su
707 Supervised Occupational Experiences & Student Groups in AgEd 2(2,0) Su
776 Curriculum inAgEd 2(2,0) Su
792 Research Problems in AgEd 2(2,0) FSSu

Adult Higher Education (AHEd)

Undergraduate Courses

400 Field Practice Training in Extension 2-5 credits
Available to a limited number of majors in agriculture or home economics interested in Extension work who have completed the junior year. Students will be assigned to a county during the summer for a period of time at the student's convenience.

Graduate Courses

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

510-610 Adult Teaching & Learning 3(3,0) Su
Emphasize teacher behavior in relation to adult learning. Social and cultural factors and their effects on learning process.

581-681 Workshop in Adult & Continuing Education 1-3 FSSu
Special areas in adult and continuing education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understandings in a current area.

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

589-689 Internship in Ed 1-6(0,6) FSSu
On-the-job participation in teaching or related fields in schools under the supervision of local school personnel and a staff member from the Division of Education.

591-691 Problems in Adult and Continuing Education 1-3 FSSu
Directed reading and research in selected individual adult and continuing education topics.

711 Organization & Administration of Adult Ed 3(3,0) Su
751 Principles of College Teaching 3(3,0)S
792 Research Problems in Adult Ed 3(2,0) FSSu

Counseling, Guidance and Personnel Services (CGPS)

Professor Schmieding, supervisor

The Counseling, Guidance and Personnel Services major is designed to assist the student to develop personally and professionally so that the person can function more effectively in a helping relationship with others. The program emphasizes the development of the professional competencies expected of qualified counselors and staff members in schools, higher education, agencies and other institutions.

Undergraduate Courses

243 Career Planning & Development 1(1,0) FSSu
Skills in career decision making. Potential career choice and employment information will be explored in relation to individual goals.

410 Prin of Guidance 2(4,0) FSSu
Developing basic human relations and helping skills; self-awareness and self-examination of the interpersonal communications process; emphasis on understanding self and understanding others.

Graduate Courses

500-600 The Exceptional Child 3(3,0) FSu
Exceptionalities in children including the mentally retarded, gifted, emotionally disturbed, physically handicapped and speech impaired. Definitions, prevalence, identification, characteristics, and educational and counseling procedures and resources are identified.

503-603 Elementary School Guidance 3(3,0) SSu
Examination of the counseling process with children. The implementation of developmental guidance programs to meet children's emotional and learning needs.

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,

communicating acceptance to others, "I Messages," changing the environment.

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 Learning Disorders of Children 3(3,0) SSu
Examination of the nature, causation and assessment of learning difficulties in children. Designed to assist educators in mainstreaming students. Emphasis placed on diagnosing, remediating and designing Individual Education Plans in compliance with Public Law 94-142.

561-661 Theories of Counseling 3(3,0) FSSu
Theories, methods and application of the counseling process at all levels. An examination of how counseling philosophy is applicable to a variety of occupations and to daily living.

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

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

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

713 Administration & Operation of Guidance & Personnel Services 3(3,0) FSu

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

742 Career Education & Occupational Information 3(3,0) FSu

766 Group Counseling 2(2,0) FSSu

787 Counseling Practicum 3-5 FSSu

788 Group Counseling Practicum 2-4 FSSu

789 Internship in Counseling, Guidance & Personnel Services 1-6 FSSu

791 Problems 1-3 FSSu

796 Research Problem in Counseling and Guidance 2(2,0) FSSu

Driver Education (DrEd)

Undergraduate Course

370 Driver Education 3(3,1) FSu
Basic course for driver education teachers in secondary schools. Techniques, materials, equipment and facilities. Organization, administration, public relations. Classroom instruction and road practice. P, EPsyc 302 and consent.

Graduate Courses

550-650 Safety Education 3(3,0) FSSu
Philosophy, content and methods requisites to teachers participation in accident prevention activities and school safety education program.

570-670 Advanced Driver Ed 3(3,1) SSu
Traffic accident problems; survey of research studies in driver education and protection; sources of materials, measurement of driver attitudes. May be conducted as regular course or short course involving full two weeks (80 hours) of instruction. P, 370.

571-671 Driver Ed Simulation 2(2,0) Su
Philosophy, organization and procedures in the use of simulators to teach Driver Education.

572-672 Alcohol & Drugs in Relation to the Driving Task 2(2,0) Su
Alcohol and drugs in relation to the individual's ability to drive. Organization of course content and materials to be used in high school Driver Education.

Educational Administration (EdAd)

A Graduate degree in Education is offered for students preparing to become school administrators. In order to qualify for a principal's administrative certificate, the individual must have completed a certain number of specified professional education courses, must have teaching experience, and must have completed a Master's degree.

Graduate Courses

700 Public School Administration 3(3,0) FSu

710 Organization & Administration of Elementary Ed 2(2,0) Su

711 Secondary School Administration 3(3,0) SSu

715 Elementary & Secondary School Supervision 3(3,0) SSu

730 School Finance 2,(2,0) SSu

732 School Buildings & Grounds 2(2,0) Su

735 School Law 3(3,0) FSu

781 Workshop 1-3

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

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

791 Problems 1-3

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

Education Evaluation and Research (EdER)

Undergraduate Course

415 Ed Measurements 2(2,0) FS
Measurements and evaluation applied to achievement in secondary school subjects. Underlying principles and best practices. Functional in emphasizing best and newest in teacher-made tests and understanding and some usage of standardized tests. Interpretation of results. P, Senior in education. Offered first part of semester.

Graduate Courses

511-611 Group Testing 3(3,0) FSu
Theory and principles of standardized group tests. Aptitude, achievement, career and personality assessment instruments. Practice in administration, scoring and interpretation of results.

590-690 Special Topics 1-3 cr.
(See SeEd Section)

761 Intro to Graduate Studies 3(3,0) FSSu

Education Foundations (EdFn)

Undergraduate Course

339 Intro to Am Ed 2(2,0) FSSu
Historical, philosophical, psychological, and sociological backgrounds for education in America. Aims and functions of American education. Organization and administration on federal, state, and local levels in America. Teaching as a profession. An overview of education in American Society for classroom teachers. P, Psyc 101, junior standing.

Graduate Courses

520-620 Philosophy of Ed 2(2,0) FSu
Comparison of historic and current philosophies of education, their major emphasis and effects on educational goals and practices today.

530-630 Special Topics 1-3(1-3,0)
Selected current issues confronting educators across the U.S. issues for study are selected from the broad categories affecting school organization patterns, changing teaching techniques and curriculum patterns, and administrative procedures. May be repeated — maximum of 6 credits.

Elementary Education (ElEd)

Undergraduate Courses

Mus 351 Music Ed I: Elementary Concepts
(See Music Section)

Graduate Courses

573-673 Elementary School Curriculum 2(2,0) Su
Nature and principles of curriculum and curriculum development in the elementary schools. Processes of curriculum change, development and evaluation. Roles of teachers, administrators, students and the public in curriculum change.

581-681 Workshop 1-3 SSu
Special areas in elementary education are comprehensively explored in an intensive time framework. Designed to increase specific skills and understanding in a current area.

Educational Psychology (EPsyc)

302 Ed Psychology 2(2,0) FSSu
Exploration into the world of the learner. Basic learning theories and use of these concepts in teaching. Focuses on disciplines, grouping, special needs, students, and multi-cultural concepts in educating and motivating students. Required for certification. P, Junior standing, Psyc 101.

Graduate Courses

523-623 Adolescent Psychology 3(3,0) SSu
Physical, social, emotional, intellectual and vocational aspects of adolescent development. Emphasis on increasing understanding of adolescents and their problems. P, 101 or 102.

551-651 Mental Health & Personality Development 3(3,0) FSu
Nature of personality; mental and emotional health of children and adults. Mental health problems and positive programs for personal mental health.

740 Advanced Ed Psychology 3(3,0) FSu

761 Practicum in Individual Testing 4(4,0)

Industrial Arts (IA)

Undergraduate Courses

191 Woodworking 3(2,3) FS
Proper use and care of hand and machine tools, with special emphasis on machines. Safety of machines and general shop. Elementary finishing and wood identification. A project is planned and constructed.

297 Carpentry 3(2,3) F
Residential construction techniques. Emphasis on machines for construction. Scientific approach to construction. Elementary blueprint reading and estimating of materials plus laboratory work.

393 Wood Turning 1(0,3) FS
Spindle turning and face plate turning, inboard and outboard, finishing on the lathe. A project using turnings will be constructed.

443 Sheet Metal 2(1,2) F
Operations in raising and forming, bending, spinning, chasing, seaming and piercing materials. Work in copper, brass, aluminum, stainless steel and sheet metal. Layout. Special emphasis on sheet metal machines. P, ES 121; EG 121-122; Senior standing or consent.

494 Cabinetmaking 2(0,6) S
Furniture design, period and modern. Special jigs and machines for cabinet work. Study of finishing as related to finishing in IA 191. More advanced projects are constructed with emphasis on special joints.

Secondary Education (SeEd)

Undergraduate Courses

121 Pedagogy I (7 sections)
(See Music Section — Mus 270)

122 Pedagogy II (7 sections)
(See Music Section — Mus 271)

221 Pedagogy III
(See Music Section — Mus 370)

222 Pedagogy IV
(See Music Section — Mus 371)

287 Practicum & Professional Lab 2(1,1) FSSu
Introduction to effective instructional procedures. Observation and work experience in elementary, junior high, and senior high schools.

321 Conducting Fundamentals
(See Music Section — Mus 260)

322 Music Education III; Supervision & Administration of School Music
(See Music Section — Mus 365)

324 The Teaching of English
(See English Section — Engl 308)

328 Philosophy & Methods in Home Economics
(See Home Ec Ed Section — HEd 311)

387 Practicum in Occupational Teacher Education
(See Home Ec Ed Section — HEd 331)

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.

404 Program Planning in Ag Ed
(See Ag Ed Section — Ag Ed 404)

405 Audio-Visual Methods & Materials 2(2,4) FS
Media used in instruction and communication. Emphasis on developing materials for use in the classroom. Small group laboratory sessions correlate with large group demonstration/lectures. You will also become familiar with the operation of audio-visual equipment. P, Senior in Education. Offered first part of semester.

441 Teaching of Speech
(See Speech Section — SpCm 375)

414 Methods of Teaching Art in Public Schools
(See Art Section — ArtE 415)

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.

417 Methods of Teaching Phys Ed & Recreation
(See Physical Education Section — PE 460)

419 Special Problems in Teaching Foreign Language
(See Foreign Language Section — MFL 420)

421 Music Education II; Instrumental Methods, Materials & Conducting
(See Music Section — Mus 361)

422 Music Education II: Choral Methods, Materials & Conducting
(See Music Section — Mus 362)

426 Preparation for Student Teaching in Home Ec
(See Home Ec Ed Section — HEd 412)

427 Experiences in Adult Ed in Home Ec
(See Home Ec Ed Section — HEd 421)

450 Teaching of Reading 3(3,0) FSSu
Designed for secondary content teachers. Basic principles of reading and comprehension, and practical experience in relating principles to everyday demands of the content classroom. A special emphasis upon content instruction which meets the reading/comprehending abilities of individual students. Required for certification.

488 Supervised Student Teaching in Secondary Schools 8(0,8) FS
Assigned in student's teaching major, or, if appropriate, in teaching minor. Scheduled in last part of semester. Application for student teaching must be made in second semester of junior year on proper application form. Required for certification. (Students, including transfer students, who will be student teaching must have a GPA of 2.2)

489 Supervised Student Teaching in Home Ec
(See Home Ec Ed Section — HEd 473)

491 Undergraduate Course Specials: (Topical) 1-5 FSSu
Ten ore 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.

492 Problems in Ed 1-3 credits
Selected studies and activities to meet the needs of undergraduate students.

494 Field Experience & Internship: (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.

494 Methods of Teaching Social Studies 2(2,0) S
Designed for prospective teachers of Social Studies. Course will focus on theories, methods, processes, organization patterns, and materials used for teaching the social studies and the individual disciplines of Economics, Geography, History, Political Science, Psychology, and Sociology. Required for majors in all of the Social Sciences. Strongly recommended for Social Science minor.

Courses in Subject Matter Areas:

Art (See Art 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)
MFL 420 Special Problems in Teaching Foreign Language

Health, Physical Ed & Recreation (See HPER Section)
PE 460 Methods of Teaching Physical Ed & Recreation

Home Economics (See Home Ec Section)
HEd 311 Philosophy & Methods of Home Ec
HEd 381 Practicum in Occupational Teacher Education
HEd 412 Preparation for Student Teaching in Home Ec
HEd 489 Supervised Student Teaching in Home Ec

Health Science (See Health Sc Section)
HSc 463 Methods and Materials in Health Ed.

Music (See Music Section)
Mus 260 Conducting Fundamentals
Mus 270 Pedagogy I (7 sections)
Mus 271 Pedagogy II (7 sections)
Mus 362 Music Ed II: Choral Methods, Materials & Conducting
Mus 361 Music Ed II: Instrumental Methods, Materials & Conducting
Mus 365 Music Ed III; Supervision & Administration of School Music
Mus 370 Pedagogy III
Mus 371 Pedagogy IV

Science (See Biology Section)
Bio 595/695 Strategies in Science Teaching

Speech (See Speech Section)
SpCm 375 Teaching of Speech

Graduate Courses

508-608 Humanistic Approaches to Teacher Effectiveness 2(2,0) SSu
(See CGPS 508-608)

540-640 Secondary School Curriculum 2(2,0) FSu
Curriculum and curriculum development in secondary schools. Processes of curriculum change, development and evaluation. Roles of teachers, administrators, students and the public in curriculum change.

545-645 Advanced Instructional Techniques 2 SSu
Opportunities for participants to learn additional techniques for use in classroom teaching. The theory underlying the techniques and their uses explored. Emphasis on techniques which allow students to gain skills in processing and manipulating information and for participation in social model skills. Opportunities for participants to analyze, practice, and create various techniques.

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, and changing roles in education.

591-691 Problems 1-3
Directed reading and research in selected individual education topics.

752 Improvement 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 elementary, 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, senior in Education.

Graduate Courses

525-625 Development of Voc Ed Thought & Practice 3(3,0) FSSu
Philosophy, origins, and development of vocational, technical and practical arts, education programs at adult, post-secondary, secondary and pre-vocational levels. Current and emerging principles, practices and issues are stressed. P, senior in Education.

731 Administration & Supervision of Voc Ed 3(3,0) Su

Electrical Engineeing (EE)

College of Engineering

Professors Ellerbruch, head; Knabach, Sander, Storry; Professor Emeritus Manning; Associate Professors Finch, Lundberg; Associate Professor Emeritus Bruce; Assistant Professor Miron; Instructor Carter

Realizing that each person is an individual, the degree program is arranged to include 32 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.

Curriculum in Electrical Engineering

For the degree, Bachelor of Science (Accredited by ABET (Accreditation Board for Engineering and Technology, Inc.)

The non-technical (17 credits), technical (15 credits), and required (104 credits) comprises the 136 credit degree. You have flexibility in choosing when elective courses are taken.

Approved humanistic and social science non-technical electives for students enrolled in the College of Engineering appears on pages 11-13. 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.

Freshman Year	**F**		**S**
Mathematical Analysis I-II, Math 123-224	5		4
Gen Chem, Chem 110 or 112 and 120 or 114	4		3
English or Speech, Engl 101 or SpCm 101	3	or	3
Engineering Design Graphics I, EG 121, or elective	2		2
Gen Physics I, Phys 211			4
Fitness & Lifetime Activities, PE 100	1		1
Engineering Orientation, GE 110	0		

Electives	x	x

Sophomore Year	**F**	
Electric Circuits I-II, EE 215-315	3	3
Electric Materials I, EE 265	2	
Electrical Instruments & Measurements, EE 317		1
Engineering Mechanics, EM 223		3
Mathematical Analysis III, Math 225		
Differential Equations, Math 321		3
General Physics II, Phys 213	4	
Computer Programming, CSc 312	2	
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		3
Digital Systems, EE 445		3
Electrical Materials II, EE 465		2
Signal and System Analysis, EE 316		3
Probabilistic Methods in EE, EE 310	3	
Advanced Engineering Math, Math 331	3	
Atomic Physics, Phys 331	3	
Advanced Exposition, Engl 303	3	
Electives	x	x

Senior Year	**F**	**S**
Linear Control Systems, EE 455		3
Control Systems Lab, EE 456		1
Lines, Antennas & Waveguides, EE 386	3	
Energy Conversion I, EPow 430	4	
Energy Lab, EPow 434	1	
Engineering Economy, GE 422		2
Analytical Thermodynamics, ME 313		3
Inspection Trip, EE 495		0
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,ECom 420 (3); Communication Systems, ECom 520 (3); Electronics III, Elec 420 (4); Integrated Circuit Enginering, Elec 520 (3); Mathematical Statistics, Math 381 (4)

Computers-Data Processing Systems (Credits); Microcomputer Applications, ECom 425 (3); Integrated Circuit Engineering, Elec 520 (3); Electronics III, Elec 420 (4); Numerical Analysis, Math 571 (3); Computer Operation, CSc 314 (3)

Bioengineering (Credits); Biomedical Electronics, EBio 570 (2); Biomedical Systems Analysis, EBio 571 (2); Integrated Circuit Engineering, Elec 520 (3); Anatomy, Zool 221 (3); Elementary Organic Chem, Chem 120 (3); Mammalian Physiology, Zool 325 (4)

Power Systems (Credits); Power System Analysis, EPow 431 (3); Advanced Power Systems, EPow 432 (3); Seminar in Power Systems, EPow 435 (1); Symmetrical Components, EPow 532 (2); Power System Stability, EPow 530 (2); Computer Analysis of Power Systems, EPow 531 (3); Mathematical Statistics, Math 381 (4); Industrial Engineering, ME 362 (3)

Remote Sensing (Credits); Mathematical Statistics, Math 381 (4); Communication Systems, ECom 520 (3); Microcomputer Applications, ECon 425 (3); Intro. to Operations Research, ME 561 (3); Optics, Phys 361 (3); Photo Interpretation and Photogrammetry, CE 306 (3)

Cooperative Education Program. There is the opportunity to work in industry and take EE 494 which is a cooperative education course.

The courses in the Electrical Engineering Department are divided into the following areas: Electrical Engineering (EE), Bioengineering (EBio) Communication Engineering (ECom), Electronics (Elec), and Power Systems (EPow).

Electrical Engineering (EE)

Undergraduate Courses

211 Intro to Electrical Engineering 1(0,2)
Concepts common in engineering and techniques of design.

215 Electric Circuits I 3(3,0)
Concepts, circuit theorems, mesh and nodal equations, steady state analysis, phasors, power and energy, ploy phase circuits. P, credit or concurrent registration in Math 225; Phys 213.

265 Electrical Materials I 2(2,0)
Structure of metals, polymers and ceramics — their properties and applications. P, Chem 110 or Chem 112, EG 121.

305-306 Basic Electrical Engineering I & II 3(2,2) & 5(4,3)
Laws of electric and magnetic fields and circuits, measurements of electric and magnetic properties, electric circuit analysis. Resonance and coupled circuits. Characteristics of equipment used in applying electric power to mechanical drive. For non-electrical students. P, Math 225; Phys 213.

310 Probabilistic Methods in Electrical Engineering 3(3,0)
Basic probability and random variables. Applications to system reliability and effect of tolerances on circuit design. Classification of random processes, correlation functions and spectral density of random processes. Response of linear systems to random inputs. Detection of signals in noise. P, EE 315.

315 Electric Circuits II 3(3,0)
Two-port resistive networks; RL, RC and RLC circuits, excited with initial conditions and forcing functions; Laplace transforms, convolution and Fourier series. P, EE 215.

316 Signal and System Analysis 3(3,0)
Topology, 2-port networks, circuit reliability, passive and active filters, symmetrical components, computer-aided circuit design, Fourier Transform. P, EE 315.

317 Electrical Instruments & Measurements 1(1,3)
Measurement theory, electrical instruments, measurement eerors, treatment of data. P, EE 215.

385 Electromagnetic Field Theory I 3(3,0)
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, conc Math 331.

386 Electromagnetic Field Theory II 3(3,0)
Selected topics in application of dynamic field theory. Generation and propagation of waves. P, 385.

445 Digital Systems 3(2,3)
Digital computer and design applications. P, concurrent with Elec 321.

455 Linear Control Systems 3(3,0)
Feedback control systems by operational methods. Stability criteria and compensation design. State variables, mini computers as controllers. P, EE 316; and Math 331.

456 Control Systems Lab 1(0,3)
Control system components and systems are designed. Concurrent with 455.

457 Special Topics & Seminar in EE 1-3
Current topics in microwaves, fields, systems and other selected areas.

465 Electrical Materials II 2(2,0)
Semiconductor and junction theory, semiconductor devices. P, EE 385, Phys 331.

485 Microwave & Radar Systems 2(2,0)
Radar and microwave system theory and operation.

490 Special Electrical Problems 1-3
Problems in EE of mutual interest to students and faculty. P, consent.

494 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.

495 Inspection Trip 0(0,0)
To industrial sites in S.D. or to a city out of state such as Minneapolis. P, Senior standing.

Graduate Courses

515-615 Linear Network Theory 3(3,0)
State variables, Laplace transform theory, matrix analysis and complex variable theory as applied to problems in circuit analysis. Topology, network theorems and network functions. P, consent.

516-616 Nonlinear Analysis 2(2,0)
Numerical, graphical and analytical methods of analysis. Singularities; systems with varying coefficients, stability of nonlinear systems, describing function methods. P, consent.

557-657 Special Topics in Electrical Engineering 1-3
P, Consent.

585-685 Microwave Theory 3(3,0)
Transmission lines, resonant cavities, waveguide junctions, and components. Active devices, lasers, masers. P, EE 386.

587-687 Electomagnetic Radiating Systems 3(3,0)
Electromagnetic waves; Poynting vector and the flow of power; guided waves; waveguides; radiation and radiation impedance; ground wave propagation; sky wave propagation. P, EE 386.

690 Special Electrical Problems 1-3
P, consent.

790 Thesis in Electrical Engineering

Bioengineering (EBio)

Graduate Courses

570-670 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, Elec 320 or consent.

571-671 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.

572-672 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, EPow 430, Elec 321.

Communications Engineering (ECom)

Undergraduate Courses

420 Communication Engineering 3(3,0)
Modulation and detection methods including circuit analysis and design for digital and analog communication systems are presented. P, EE 315; Elec 320.

425 Microcomputer Applications 3(2,3)
Basic concepts, organization, and applications of microcomputers. Principles of microcomputer programming and operation using assembly and PL/M language. Laboratory experience with a microcomputer. P, FORTRAN programming and consent of instructor.

426 Computer Architecture & Organization 3(3,0)
Computer organization, operating principles and design considerations from a software or programming point of view. Assembly language programming is used to reinforce the study. P, FORTRAN and Assembly language programming and consent.

Graduate Courses

520-620 Communication Engineering 3(3,0)
Statistical methods, random signals and noise, physical sources of noise, statistical communication theory and digital communications. P, ECom 420 or consent.

525-625 Digital Systems Hardware Design 3(3,0).
Design and organization of digital systems with strong emphasis on systems hardware and its function in a digital computer. Translation of high level computer instructions into hardware designs for digital computers. P, EE 445 or consent.

526-626 Digital Logic 3(3,0) or 3(2,3)
Logic functions design of combinational and sequential digital circuits; circuit races and hazards. P, EE 445.

Electronics (Elec)

Undergraduate Courses

120 Electronics for Everyone 2(2,0)
Electronic devices, instruments and systems are considered. Sophisticated systems such as computer and consumer electronics are studies. A student will become more aware and knowledgeable of their electronic environment and potentials for quality living. P, Algebra.

320 Electronics I 4(4,0)
Analysis of electronic devices and circuits. Introduction to electronic circuit design. P, EE 215. Computer Aided Design (CAD) included.

321 Electronics II 3(3,0)
Design and analysis concepts for linear and digital electronic circuits. Emphasis on integrated circuit design. P, Elec 320.

322 Electronics Laboratory I 1(0,3)
Experimental design of basic electronic circuits. P, concurrent with Elec 321.

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 Elect 321.

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, Elec 321; Elec 322.

Graduate Courses

520-620 Integrated Circuit Engineering 3(3,0)
Analysis and design of modern integrated circuits. New devices and design concepts. P, Elec 321 or equivalent.

720 Advanced Electronics 3(3,0)

Power Systems (EPow)

Undergraduate Courses

300 Fundamentals of Lighting 3(3,0)
Light sources, fixtures, lighting calculations, decorative lighting, lighting for special effects, home lighting and special problems. P, consent.

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, EPow 430, or consent.

432 Advanced Power System Analysis 3(3,0)
Symmetrical components, protective devices, economic generation, and stability analysis of power systems. P, EPow 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, EPow 430, EPow 432 or consent.

434 Energy Laboratory 1(0,3)
Experimental work with energy transfer and energy conversion devices. P, EPow 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.

Graduate Courses

530-630 Power System Stability 3(3,0)
Inertia constant, swing-curves, equal area criterion, as applied to transient stability studies. P, EPow 430 or consent.

531-631 Computer Analysis of Power Systems 3(3,0)
Concepts used in formulating load flow and fault study problems for computer solution. P, EPow 430; EPow 432 or consent.

532-632 Symmetrical Components 2(2,0)
Application of symmetrical components to simple three phase circuit, unloaded systems, loaded systems. Symmetrical component impedances. P, EPow 430; EPow 432 or consent.

533-633 Alternate Energy Conversion 2(2,0)
Basic principles and design equations of thermoelectric and thermionic devices, magnetohydrodynamic converters, solar cells, and fuel cells. P, EPow 430; ME 313, or consent.

Engineering Graphics (EG)

College of Engineering

Professor Skubic, head; Instructors Gamble, Kreyger, Lellelid.

121 Engineering Design Graphics I 2(0,6) FS
Analysis of projection. Methods of systematic interpretation and representation of data, problems, and 3 dimensional shapes. Functional scales, mathematical charts and graphs. Development of instrument drawing and sketching as a means of design. P, Math 111 or equivalent.

122 Engineering Design Graphics II 2(0,6) FS
Continuation of EG 121. Vector geometry. Graphical conventions and design applications as expressed through free hand technical sketching. Introduction to computer graphics. P, 121, Math 120 or equivalent.

223 Architectural Design Drafting 3(1,6) S
Frame building construction. Practice in modern drafting procedures. Opportunity to design a building of student's choice. 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.

Engineering Mechanics (EM)

College of Engineering

Course objectives in Engineering Mechanics are to develop your 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 adequately 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, statics and dynamics of real and ideal fluids; continuity and Navier-Stokes equations applied to laminar and turbulent incompressible flows, boundary layer analysis. Introduction to compressible flow. P, EM 222, Math 321.

Graduate Courses

521-621 Introduction to Mechanics of a Continuous Medium 3(3,0) (On sufficient demand)
General theory of a continuous medium. Kinematics of deformation and flow; stress tensors; conservation of mass, momentum and energy; invariance requirements; constitutive equations for solids and fluids; applications for special problems. P, EM 331, Math 331.

522-622 Theory of Elasticity 3(3,0)
Analysis of stress and strain; equilibrium and compatibility equations; Hooke's law; fundamental problems in the theory of elasticity; plane-stress and plane-strain problems of the narrow beam, rotating discs and a plate with a circular hole. P, EM 321, Math 331 or equivalent.

523-623 Theory of Plasticity 3(3,0)
Analysis of stress and strain; plastic behavior of materials; basic laws of plastic flow; applications to bending of beams, torsion of bars and thick-walled cylinders; slip line theory and its application to extrusion problems; limit analysis theorems and their applications to structural problems. P, EM 522-622 or consent.

524-624 Theory of Plates & Shells 3(3,0)
Small deflection theory of plates. Laterally loaded rectangular plates. Navier and Levy solutions. Plates of various shapes, boundary conditions and loading systems. Basic equations of the theory of shells. Design problems in cylindrical shells. P, EM 321, Math 321, Math 331 or consent.

531-631 Advanced Fluid Mechanics 3(3,0)
Fundamental notions of continuum, stress at a point, velocity field and vorticity. General principles of kinematics and dynamics of a fluid. Potential flow and vortex motion. P, EM 331, Math 331 or equivalent.

EM 541-641 Finite Element Analysis 3(3,0) Alternate years
Theoretical basic of finite element analysis — an approximate method which analyses problems by using small but finite elements rather than the infinitesimal elements of the calculus. Two- and three-dimensional stress analysis, plate bending, and shell problems. Static, dynamic and stability problems. Geometric and material non-linearities. Introduction to both heat and fluid flow problems. P. Math 321 and consent.

Engineering Shop (ES)

College of Engineering

Professor Skubic, head; Professor Emeritus Anderson; Assistant Professors Svec, Wakeman

You may take certain courses in Engineering Shops to become acquainted with various industrial processes closely associated with practical engineering principles. In working with machine tools and other equipment you will acquire some 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 provided for in the metal processing field and for construction of experimental equipment for other university engineering departments.

Undergraduate Courses

121 Machine Shop 2(1,2)
Machine tools in industry, principles of operation, production methods and related equipment. Introduction to jigs and fixtures.

131 Welding 2(1,2)
Lectures, demonstrations and exercises. Gas and arc welding, cutting, heat treatment, spot welding and related information.

222 Machine Shop 2(1,2)
Complicated processes involving operation of machine tools. Introduction to tool and die work and methods of inspection. P, 121.

223 Machine Shop Problems 1(0,3)
Emphasis on tool making and solution of individual problems in set up work. P, 222 or 225.

225 Metal Processing 1(0,3)
Problems and solution related to industrial machine tools and other production equipment, automation, numerical control, and introduction to metal casting. P, recommended for engineering students.

232 Welding 2(1,2)
Advanced application of arc and gas welding, position welding, pipe welding and joining of non-ferrous metals. Identification of metals. P, 131.

233 Welding & Metallurgy 2(1,2)
For technical students. Enough metallurgy to give you a basis for determining whether or not welding can be applied, and to predict success or failure. P, 232.

235 Metal Processing 1(0,3)
Engineering approach to science of joining metals. Capabilities and limitations of present equipment. Brief introduction to metallurgy, heat treatment of steel and characteristics of other metals and alloys. Gas welding, arc welding and related equipment. P, recommended for engineering students.

241 Shop 1(0,3)
Use of sheet metals in manufacture of electrical equipment. Layout, punch press dies, spot welding, soldering and mechanical methods of fastening sheet metal. P, EG 121.

English (Engl)

College of Arts and Science

Professor Alexander, head; Professors Brown, Evans, Marken, West, Witherington, Yarbrough; Professor Emeritus Walz; Associate Professors Foreman, Jackson, Kildahl, Williams, Woodard, Associate Professor Emeritus Nagle; Assistant Professors Brandt, Duggan, Taylor, Veglahn

The English Department offers instruction in clear thinking and expression, the development and use of language, the literature of the western world, especially Britain and America, literary criticism, and technical writing. An English major prepares students for teaching careers, for writing and editorial work, for professional schools of law, business, theology, library science, and social work, and for any endeavor in which facility in the use of language is essential.

Undergraduate Major Requirements

Students majoring in English may qualify for the Bachelor of Arts degree. By taking the required courses in Education, they can satisfy the requirements for certification as secondary teachers. English majors have wide choice within the major areas of literature. The major requires 33 hours in English: twelve hours must be in English Literature, nine hours must be in American Literature, one advanced writing course must be taken and one course must be taken in linguistics. English 101 or 191 and English 300 do not count in the 33 hours major requirement. Those who plan to teach must also take English 308 and 309. Prospective teachers of English must maintain a grade-point average of at least 2.5 in all English courses.

English majors not planning high school certification must meet the requirements listed in the preceding paragraph, excepting English 308 and 309. English majors must take either History 121 and 122 or Philosophy 317 and 318. In addition they are required to present a minor in a field other than English, chosen in accord with their interests and professional purposes.

Undergraduate Minor Requirements

The English minor consists of 9 hours of English literature, 6 hours of American literature, one course in composition (303 or 383) or linguistics, and additional English electives to total twenty hours. Freshman Composition and Junior Composition are not counted toward the minor. Each student desiring to complete a minor in English should consult the Head of the Department of English not later than the beginning of his junior year.

Note: Because the high school English teacher is frequently assigned such responsibilities as directing a play, and other speech activities or sponsoring the school paper or yearbook, the English major who plans to teach is encouraged to take courses in theatre, oral interpretation and the supervision of school publications.

Students may exempt some composition requirements by taking the college level examination (CLEP) and achieving a passing score.

Graduate Study

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

Curriculum in Arts and Science, English Major

Leading to the Bachelor of Arts degree

Freshman Year	**F**	**S**
Fr Comp, Engl 101 or 191	3	
Foreign Language	4	4
Social Science elective	3	3
*Basic Natural Science	4	4
Fund of Speech, SpCm 101		
Fitness & Lifetime Activities, PE 100	1	1
**Elective		2
Sophomore Year	**F**	**S**
English or Am Lit Courses	3	3
Foreign Language	3	3
Social Science elective	3	3
*Basic Natural Science	3	
†Gen Psychology, Psyc 101	3	
†Practicum & Professional Lab Experiences, SeEd 287		2
Elective		6
Junior Year	**F**	**S**
Junior Comp, Engl 300	3	
English or Am Lit Courses	6	6
Creative Writing, Engl 383 or Adv Exposition, Engl 303		2
English or Am Lit Course	3	
†Structure of English, Ling 425		2
†Teaching of English, Engl 308		2
†Intro to Am Ed, EdFn 338	2	
†Ed Psychology, EPsyc 302	2	
**Elective		4
Senior Year	**F**	**S**
†Ed Measurements, EdER 415	2	
†Methods of Teaching in Secondary Schools, SeEd 488	3	
†Prin of Guidance, CGPS 410	2	
†Audio-Visual Methods & Materials, SeEd 405	2	
Supervised Teaching in Secondary Schools, SeEd 488	8	
Electives		15

†Required of all students preparing to teach in public schools; others may substitute courses appropriate to their purposes and interests. In the senior year, the semesters may be reversed in order. Students who wish to teach in high school should consult the Dean of Division of Education before registering for the first semester of their junior year.

Courses in the English Department are divided into two areas, English (Engl) and Linguistics (Ling).

English (Engl)

Undergraduate Courses

003 English as a Second Language 3(3,0) FS
Basic pronunciation, Conversation, oral comprehension, and grammar.
Conversation, oral and written comprehension, vocabulary and idioms, grammar, and beginning composition. Strongly recommended for entering international students.

101 or 191 Freshman Composition 3(3,0) FSSu
No student may receive credit toward graduation in more than one of these courses.
Training in efficient, accurate reading and in clear, effective writing. Instruction is included in standard English grammar, usage, and punctuation.

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

215 Modern World Literature 3
Masterpieces of World Literature (in translation) from the Renaissance to the present. Offered alternate semesters.

218 Introduction to Literature 3(3,0) FSSu
Principal literary types — fiction, drama, and poetry — to acquaint you with critical sense of aesthetic form.

223 Old & Middle English Literature 3(3,0)
Emphasizing pre-Norman heroic and Christian literature, the work of Chaucer and his contemporaries, and folk literature such as the ballads.

224 Poetry and Prose of the English Renaissance 3(3,0)
Major writers (excluding Shakespeare) of the sixteenth and early seventeenth centuries. Emphasis on the works of Milton.

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

252 Biography 2 S (Alternate years)
Studies in biography and autobiography as literature.

256 Literature of the American West 3(3,0) FS
Attention given to various attitudes toward the West expressed in literature.

263 Poetry 2(2,0) FS
Selected poems, British and American.

265 Fiction 3(3,0) FS
Narrative prose: short story, novelette, and novel.

267 Drama 3(3,0) FS
Selected plays from classical times to the mid-nineteenth century.

290 Significant Books 1(1,0) FS
Significant books elected in the light of your interests and needs. Not open to freshmen. May not be substituted for courses required in any curriculum.

300 Junior Composition 3(3,0) FSSu
Advanced course in clear, effective logical prose reading and writing. P, 101 or 191 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 or permission.

307 Writing in the Sciences 2(2,0)
The writing and discussion of scientific descriptions. Primarily designed for those taking courses in the sciences. Assignments include: descriptions of processes, writing of instructions, of definitions, abstracts, adjusting of writing style according to audience.

308 Teaching of Composition and Grammar 3(3,0) F
Techniques, materials, and resources for teaching English language and literature to high school students. Required of majors planning to teach in the secondary schools.

309 Teaching of Literature 3(3,0) S
Techniques, materials, and resources for teaching literature to high schools. Required of majors planning to teach in secondary schools.

310 Mythology & Literature 3(3,0)
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)
Structural analysis of Old and New Testament texts which are literary in form (i.e. lyric, dramatic, epic, and narrative) for their aesthetic and ethical meanings. Comparison and relation of Hebraic form to modern symbolic modes.

321-322 English Literature 3(3,0) FS
English literature survey from Beowulf to modern times.

331 Eighteenth-Century English Literature 3(3,0)
Literature of the English Augustan age, (1660-1800) particularly Swift, Dryden, Pope, Johnson.

322 The Early 19th Century 3(3,0)
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 F (Alternate years)
Studies in the English novel from its beginnings through the 17th and 18th centuries.

341-342 American Literature 3(3,0)
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)
Concentrating on myths and legends of major language groups, particularly the Siouan.

352 American Indian Literature of the Present 3(3,0)
After defeat of the tribes, concentrating on autobiography, fiction, and poetry by Indian authors.

357 19th Century American Poetry 2(2,0)
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)
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)
Development of American short story, emphasis on form from beginnings with Irving to present.

383 Creative Writing 2(2,0)
Writing of fiction, drama, biography, or poetry. P, 12 hours of English or consent.

393 Undergraduate Course Specials (1-5)

395 Directed Studies Program (1-9)

425 The Late 19th Century 3(3,0)
English literature of the last half of the 19th century, particularly novels (Dickens, Eliot, Hardy, Conrad) and poetry (Tennyson, Browning, Arnold).

433 Shakespeare 3(3,0)
Representative comedies, tragedies, and histories of Shakespeare.

439 Twentieth-Century British Literature 3(3,0)
British literature since 1900.

453 Hawthorne & Melville 3(3,0)
Major works of the two great novelists of the American Renaissance.

454 Twain & James 3(3,0)
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 2(2,0)
Intensive study of a selected phase or type of American literature, specifically concentrated on recent trends in fiction and poetry.

463 Modern Drama 2(2,0) F
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.)

493 College Honors Project (1-6)

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

498 College Honors Seminar (1-6)

Graduate Courses

NOTE: Junior or senior standing and 16 hours of English are prerequisite to all courses, numbered 500-600 to 590-690 inclusive. Courses 620, 623, 626, 627, 693, 694 and 697 may be repeated for credit, when the content is not duplicated.

506-606 Workshop in English & Speech
Sessions in linguistics, composition, or literature. A concentrated course; may not be taken concurrently with any other course. P, teaching experience or consent.

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

520-620 Studies in Early English Literature 2-3(2-3,0)
A phase of English literature of the era before 1550.

523-623 Studies in Restoration and Eighteenth-Century Literature 2-3(2-3,0)
An important writer or group of writers or a significant aspect of English neoclassical literature.

525-625 Victorian Literature 2-3(2-3,0)
Chief writers of British poetry and prose from 1840 to 1900, with emphasis on aesthetic and intellectual developments.

526-626 Studies in 17th Century Literature 2-3(2-3,0)
Study of some important writer (Donne, Milton, Bunyan) or aspect (Metaphysical Poetry, Restoration Drama) of English literature between 1603 and 1700.

527-627 Studies in Elizabethan Literature 2-3(2-3,0)
An area of Elizabethan literature chosen to meet the needs and interests of the students.

530-630 The English Romantic Movement 3(3,0)
Chief writers of English Romantic poetry and prose from 1789 to 1832, with emphasison intellectual trends.

534-634 Advanced Shakespeare 3(3,0)
Selected plays of Shakespeare and significant Shakespearean criticism.

535-635 Chaucer 2-3(2-3,0)
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 2-3(2-3,0)
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.

584-684 Literary Criticism 3(3,0)
A theoretical and practical course emphasizing the variety of approaches available to students and teachers of literature.

590-690 Research Tools in the Humanities 2(2,0)
Reference and research materials of special value and interest to students of the Humanities. **Required of all candidates for the M.A. degree in English.**

592-692 Seminar in American Indian Literature 2-3(2-3,0)
American Indian Literature of the past or present; concentration on the Plains Indians.

593-693 Seminar in English Literature 2-3(2-3,0)
Intensive study of a selected type, author, or period of English literature.

594-694 Seminar in American Literature 3(3,0)
Detailed investigation through discussion of major works, development of biographical materials, and presentation of student papers of selected and specific writers and movements in American Literature.

597-697 Special Studies in Composition & Literature 1-3(1-3,0)
Special studies in various areas of writing, grammar, and literature. May be repeated to total 4 credits. Given only with the permission of the Chairman of the Department.

705 Problems in Teaching Composition & Literature 3(3,0)
758 Modern American Thought 3(3,0)
790 Thesis 5 credits. P, 690.

Linguistics (Ling)

Undergraduate Courses

425 The Structure of English 3(3,0)
Use of traditional, structural, and transformational grammars for describing the English language. Practical application in teaching. Strongly recommended for majors planning to teach.

Graduate Courses

520-620 The New English 3(3,0)
Theory of transformational grammar and its approach to phonology, grammar, and semantics. Transformational grammar applied to language acquisition, English teaching, and second language teaching. Brief attention to stratificational grammar.

543-643 Development of the English Language 3(3,0)
Historical survey of phonology, grammar, syntax, and lexicon of English leading to an understanding of the present state of the language and future developments.

European Studies Program (EurS)

Gordon Tolle, Political Science Department, Coordinator; David Crain, History; Randal Day, Child Development; Harry Greenbaum, Economics; Donna Hess, Rural Sociology; Karen Kildahl, English; Charles Lingren, Education; Ruth Redhead, Foreign Languages; Anton Richter, Foreign Languages.

The European Studies Program is an area study that combines the insights of many disciplines as they are focused on Europe. These areas include language and literature, history, art, philosophy, music, sociology, economics, political science, geography, health science, professional education, family studies, and organizational studies. The topics for the two core courses, Topics in European Culture and Topics in European Society, will vary. Both courses will deal with comparative and interdisciplinary topics, which will usually be taught by more than one instructor.

Why European Studies? One of the goals of SDSU is to broaden the horizons of its students. Studying other cultures contributes to this liberating education. European studies is important because we live in an interdependent world; politically, economically, and culturally we have important ties with Europe. Many Americans trace their heritage to European roots. An improved understanding of that heritage, therefore, acts to give us a better understanding of our own society.

The benefits of this program are as follows: **Careers:** The European Studies Program will better prepare students for jobs in trade and commerce with Europe, tourism, primary and secondary school teaching, work for multinational firms, and work in various international agencies. **Cultural Understanding:** European Studies provides an opportunity to develop a greater understanding of European cultures which have had a great influence on American culture and on the entire world. **Social Awareness:** By examining the social institutions and policies of other "developed" or "first world" countries, European Studies provides an opportunity to develop a greater appreciation of international interdependence as well as greater insight into alternative social arrangements.

To enroll in this program you should contact the coordinator Dr. Gordon Tolle, Department of Political Science, Tel. 688-5028. Upon graduation and completion of the program, a notation will be entered on your transcript.

The European Studies Program is an interdisciplinary program, requiring the student to take courses in both the humanities and social sciences. Almost all of these courses are also eligible to satisfy university core requirements (e.g., French 101 would fulfill part of a language requirement, and History 122 would fulfill part of the social science requirement). As a result, you might complete the program without adding credits beyond the university core.

At least 21 of the 29 credit hours must be from outside your major department.

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

Curriculum in European Studies Program

(Total of 29 hours. Because courses used to satisfy the university core and 8 hours from your major department may be counted, the total number of **additional** credits may vary.)

Requirements	Credits
Language: one year of **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 of 84 courses, available from any committee member. 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.)

Forestry (F)

(See Horticulture-Forestry)

Foreign Language (FL)

College of Arts and Science

Professor Bates, head; Professors Barnes, Redhead, Richter, C. Sunde; Associate Professors Baker, Beattie, Iden; Assistant Professor Sumner; Instructor 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 trade 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

You may select a curriculum leading to the Bachelor of Arts or the Bachelor of Science degree. Also, an individual or a composite major may be selected. You may also select a minor and, if you plan to teach, such a choice is highly desirable.

The Individual Major

One foreign language requires a total of 36 semester credits in the language.

The Composite Major

Based on the study of **two** foreign languages. Required are 45 credits, 27 in a first language and 18 in a second.

The Minor in a Foreign Language

Granted upon completion of the foreign language requirement for the B.A. degree of 14 credits plus 6 additional in the same language.

Teacher Education in a Foreign Language

Consult with the dean of the Education Division before registering for the first term of the junior year. See "Education Curriculum of Teachers of Academic Subjects" in the Education section of this catalog for requirements, plus MFL 420, Foreign Language Teaching Methods.

Placement Examinations

Entering freshmen who have successfully completed two or more years of a foreign language in high school are encouraged to take a placement examination. In exceptional cases, transfer students may be required to take such examinations, for placement purposes.

Students tested will be assigned to the college course in the appropriate language according to the examination score. Those excused 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.

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 advisor or the head of the department.

Foreign Language courses are divided into the following areas: general courses in Modern Foreign Languages (MFL), 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 suggested curricula outlined below.

You must complete 40 credits in courses numbered 300 or above to qualify for a degree.

*Students strongly interested in Geography should refer also to the Geography Department section of the catalog for the information regarding the Geographic technical option — Foreign Languages.

Curriculum in Arts and Science, Individual Foreign Language Major

Leading to the Bachelor of Arts degree
(For Composite Foreign Language Major, See * below)

Freshman Year	**F**		**S**
Foreign Language (First Year)	4		4
Fr Comp, Engl 101 or 191	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**
Foriegn Language (Second year)	3		3
Foriegn Language (Composition & Conversation)	2		2
Engl Lit elective (Appr. by advisor)	3		
Natural Science electives	3-4		3-4
Humanities electives	3		3
Electives†			
Junior Year	**F**		**S**
Foreign Language (Advanced Courses)	4-5		4-5
Junior Comp, Engl 300	3		
Social Science elective	3		
History elective appropriate to major			3-4
Natural Science elective	3	or	3
Electives†			
Senior Year	**F**		**S**
Foreign Language (Advanced Courses)	4-5		4-5
Electives†			

*THE COMPOSITE MAJOR requires completion of the above program with the exception of following a different language sequence. Careful counseling with your adviser is necessary for implementation of this program.

Curriculum in Arts and Science, Individual Foreign Language Major

Leading to the Bachelor of Science degree

Freshman Year	F		S
Foreign Language (First Year)	4		4
Fr Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Hist. of West. Civ., Hist 121-122	3		3
Social Science elective			3
Mathematics elective			3-5
Fitness & Lifetime Activities, PE 100	1		1
Electives†			

Sophomore Year	F	S
Foreign Language (Second Year)	3	3
Foreign Language (Composition & Conversation)	2	2
Engl Lit elective (appr. by Advisor)	3	
Social Science electives	3	3
Natural Science electives	4	4
Electives†		

Junior Year	F	S
Foreign Language (Advanced Courses)	4-5	4-5
Junior Comp, Engl 300	3	
Social Science elective		3
Physical Science elective	4	4
History elective appropriate to major		3-4
Electives†		

Senior Year	F	S
Foreign Language (Advanced Courses)	4-5	4-5
Humanities electives	3	3
Electives†		

†You are encouraged to use electives not only for broadening your education but for studying in some depth a second discipline. Consult with your advisor.

Modern Foreign Languages (MFL)

Undergraduate Courses

134 Foreign Cultures (Topical) 3(3,0)
Life, thought, culture and language of one of the subject peoples. Provides a broad view of the civilization of the French or German or Spanish-speaking people, including history, literature, institutions, social life, customs, political structures, etc. If appropriate, it will include the study of the subject people's heritage in South Dakota. No prerequisites. Intended for students from all disciplines. May be repeated for credit twice if the topic changes. Taught in English. Not valid for meeting foreign language requirements.

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

395 Living & Study Abroad Program 1-6(1-6,0)
Refer to the Arts and Science Alternatives and Option statement. Prior approval by the department head and dean required.

420 Foreign Language Teaching Methods 1-3(1-3,0)
Seminar dealing with problems encountered in teaching modern foreign languages. Textbook selection, subject matter presentation, testing, realia and laboratory techniques. Consult with head of the department during year previous to taking this course. Required for all foreign language majors and minors who plan to teach. On demand.

423 Seminar in French, German or Spanish (Topical) 1-3(3,0)
Detailed reading and discussion of major works dealing with French, German or Spanish language, literature or culture. Focus on language, literary appreciation, writers, culture, or artistic movements. Students will be expected to express themselves in the particular language, both orally and in writing. Reports in the foreign language will be required. Topics will vary, and course may be repeated for a maximum of 9 credit hours. Prerequisites: two years of college French, German, or Spanish, or consent of instructor.

484 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 a 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 Services. P, Junior standing.

French (Fren)

Undergraduate Courses

101-102 Intro to French Language & Culture 4(4,1)
Fundamentals of language structure and introduction to French culture enabling student to converse, read, and write simple French. Classwork supplemented with Foreign Language laboratory.

201-202 Language & Culture of France 3(3,1)
Aims of the introductory course continued. Emphasis on cultural and intellectual aspects of French life and literature. Classwork supplemented with foreign language laboratory. If enrolling in this course you are urged to study 311-312 concurrently. P, Fren 102 or equivalent.

311-312 French Composition & Conversation 2(2,1)
Development of ability in composition and conversation. Classwork supplemented with foreign language laboratory. P, Fren 201-202 or concurrent.

353 Theatre et Nouvelles 3(3,0)
Intro to French literature through reading and discussion in French of selected plays and short stories. P, Fren 202 or consent.

354 Poesie et Romans 3(3,0)
Intro to French literature through reading and discussion in French of selected poetry and novels. P, Fren 202 or consent.

411-412 Advanced Composition & Conversation 2(2,0)
A study of French style and rhetoric and intensive practice in conversation. 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, Mollere, and Madame de Lafayette. P, 354 or consent. On demand.

475 Raison et Sensibilite Au 18 Siecle 3(3,0)
Reading and analysis of major literature works from *Manon Lescant* to *Les Liaisons dangeureuses.* P, 354 or consent. On demand.

477 Du Romantisme au Symbolisme 3(3,0)
Reading and analysis of selected prose fiction, poetry and drama of the 19th century. P, 354 or consent. On demand.

479 Le Vingtieme Siecle 3(3,0)
Reading and analysis of representative works of novelists, poets and dramatists of the 20th century. P, 354 or consent. On demand.

490 Directed Study in French 1-3(1-3,0)
Readings and discussions in French as directed by the instructor. May be repeated for credit. P, two years of the language and/or consent.

German (Germ)

Undergraduate Courses

101-102 First-Year German 4(4,1)
Fundamentals of language, enabling you to understand, speak, read, and write simple German. Classwork supplemented with foreign language laboratory.

201-202 Second-Year German 3(3,1)
Aims of first-year German continued with emphasis on modern cultural aspects of the two Germanies, Austria, and Switzerland. Classwork supplemented with foreign language laboratory. If enrolling in this course you may study 311-312 concurrently. P, Germ 102 or equivalent.

311-312 German Composition & Conversation 2(2,0)
Development of ability in composition and conversation focusing on typical situations in everyday German life. P, Germ 201-202 or concurrent.

321 Scientific German 1(1,0)
Emphasis on reading and translation of scientific German. P, Germ 202 or concurrent.

353-354 German Literature 3(3,0)
Introduction to German literature through readings and discussion in German of representative literary works from various genres and epochs. P, Germ 312 or consent.

411-412 Advanced Composition & Conversation 2(2,0)
More intensive development of ability in composition and conversation, placing special emphasis on idiomatic expressions and flexibility within the language. P, Germ 312. On demand, Topics vary. May be repeated once for credit.

433-434 German Civilization 2(2,0)
German civilization and culture including music, art, literature, government, geography, education, etc. 433: from beginning of German civilization to 1869. 434: from 1870 to present. Readings and discussions in German. P, Germ 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)
Some of the major works of German dramatists after the turn of this century. Readings and discussions in German. P, Germ 354 or consent. On demand.

490 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/or 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. Exemption possible by placement examination.

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. Exemption possible by placement examination.

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.

311-312 Spanish Composition & Conversation 2(2,1)
Practice in composition and conversation. Classwork may be supplemented with foreign language laboratory. Students are encouraged to take 201-202 concurrently. P. Span 201, 202, or concurrent.

353-354 Spanish Literature 3(3,0)
Introduction to Spanish literature through reading and discussion in Spanish of recognized works. P. Span 202 or consent. On demand.

355-356 Spanish American Lit 3(3,0)
Introduction to Spanish American literature through reading and discussion in Spanish of recognized works. P. Span 202 or consent. On demand.

411-412 Spanish Advanced Composition & Conversation 2(2,0)
Polishing of all language skills to achieve maximum fluency. P. Span 311-312 or consent. On demand.

433-434 Spanish Civilization 2(2,0)
The variety of topics studied may include history, culture, art, architecture, literature, geography, government and religion. P. Span 202 or consent. On demand.

435-436 Spanish American Civilization 2(2,0)
The variety of topics studied may include history, culture, art, architecture, literature, geography, government and religion. P. Span 202 or consent. On demand.

443 Advanced Spanish Grammar 3(3,0)
In-depth study of traditional grammar as well as an introduction to linguistics as it applies to Spanish. Practical application. Strongly recommended for future teachers and bi-lingual secretaries. P, Span 202. On demand.

470 The Golden Age 3(3,0)
Major works of the Golden Age of Spanish literature (1492-1682). Emphasis may vary. Classes in Spanish. P. Span 353-354 or consent. On demand.

475-476 19th & 20th Century Spanish Literature 3(3,0)
Major movements and works. Reading, writing and discussions in Spanish. Topics vary. P, Span 353-354 or consent. On demand.

481 Hispanics in the U.S. 1-3(1-3,0) On demand.
A variety of topics may be covered including history, art, culture, literature, politics, religion and geography. P. 202 or consent.

484 20th Century Spanish American Literature 3(3,0)
Major movements and works. Reading, writing and discussions in Spanish. Topics vary. P, Span 355-356 or consent. On demand.

490 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/or consent.

General Engineering (GE)

College of Engineering

L.G. Skubic, coordinator; Administrative Committee: Dean of Engineering J.O. Storry; Professors Ellerbruch, Johnson, Moe, Tunheim, Rollag, Hooks

Courses in General Engineering are listed as Computer Science (CSc), Engineering Graphics (EG), Engineering Mechanics (EM), Engineering Shops (ES) and General Engineering (GE). The courses include those that provide fundamentals in curricula of all engineering departments and those that serve other university students.

Undergraduate Courses

110 Orientation for Engineers 1(1,0) FS

231 Technology & Society 2(2,0)
An examination of technological change by means of current problems and case studies. The creation and utilization of tools, machines, materials, techniques and technical systems will also be studied, as well as the life and works of various innovators in science and technology.

270 Special Topics 1-3 FSSu

290 Special Problems 1-3 FSSu
P, consent.

422 Engineering Economy 2(2,0) FS
Economic aspects of engineering, cost estimating and financing. P, senior standing.

494 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.

600-601 Seminar 0-1(1,0) FS

770 Engineering Design or Research Paper 1-2

Geography (Geog)

College of Arts and Science

Professor Hogan, head; Professor Gritzner, C., Johnson, Landis, Reeves; Associate Professors Draeger, Opheim, Wilner; Assistant Professors Loveland, Roberts, Samuelson, Sandness, Gritzner, J.; Instructor Gab

As society grows more complex and science and technology open new frontiers of knowledge, an understanding of geography and what it entails becomes more important. Geography is the science that seeks to describe, relate and explain those things, both natural and cultural, that distinguish places on the earth's surface. As such, a fundamental theme in geography is the process of continual change, and how humans modify the earth as their cultural value system and level of technology dictate. The study of geography is thus of vital concern to all citizens and should be a significant part of the education of all students.

The undergraduate program is designed to provide you with a broad education with a concentration in the major field of study. It is recommended you take several courses in disciplines closely related to your specific area of interest in geography. Those interested in physical geography might take associated courses in physics, agricultural sciences, botany or other related disciplines. If interested in cultural geography, work in sociology, history, political science or foreign language might be recommended. For economic geography, outside work in economics might be beneficial.

Two bachelor's degrees, the Bachelor of Arts and the Bachelor of Science are available. In addition to the standard degree programs, there are presently available three options in the Geography major: the Geographic Technical Environmental Management and the Urban and Regional Planning. The Geographic Technical Option stressing research techniques and/or foreign language is oriented towards future employment in governmental, industrial, military, or planning positions. The Environmental Management Option is designed to prepare you for careers in governmental, industrial, managerial and recreational areas. The Urban and Regional Planning Option is designed to prepare you for positions with governmental agencies, industry and real estate and commercial corporations.

The Master of Science degree is offered for students interested in graduate work in geography.

Courses in Geography fall into two major categories: (1) systematic — the character and distribution of elements of the physical environment (physical geography) and our basic activities in response to the physical environment (cultural geography), and (2) regional — the occurrence of physical and cultural elements within a particular area or place. The study of geography provides you with methodology and techniques for research and teaching functions by enabling you to understand our physical and cultural environment.

Curriculum in Arts and Science, Geography Major

Leading to the Bachelor of Arts degree

	Credits
BASIC UNIVERSITY REQUIREMENTS	62-64
Fr. Comp, Engl 101 or 191, & 300	6
Fund of Speech, SpCm 101	3
Fitness & Lifetime Activities, PE 100 (two semesters required)	2
Foreign Language, (8-14 hours determined by proficiency testing)	14
Humanities (Engl 218 plus 9 hours from two disciplines on approved list)	12
Mathematics (any Math course)	3
Natural Science (from two disciplines on approved list) Physical Geography, Geog 131 & 132	8
Natural Science elective	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 23 hours for prospective teachers, option electives and/or free electives)	32-34
Total Hours	128

Curriculum in Arts and Science, Geography Major

Leading to the Bachelor of Science Degree

	Credits
BASIC UNIVERSITY REQUIREMENTS	48
Fr Comp, Engl 100, 101 or 191 & 300	6
Fund of Speech, SpCm 101	3
Fitness & Lifetime Activities, PE 100 (two semesters required)	2
Humanities (two disciplines from approved list)	8
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, options electives and/or free electives)	48
Total Hours	128

Suggested Optional Electives in the Geography Majors

Environmental Management **(Credits)**

WL 210 (2); Recr 440 (2); †Electives in the Physical Environment (9); †Electives in the Cultural Environment (9); Total 22

***Urban and Regional Planning**

Option electives to be selected from departmental list of courses in CE, EG, La, Plan, PolS, PS, Recr to total 18 credits.

†Technical Geography — Science **(Credits)**

Physical Science Electives (6); Agricultural Science, or Engineering Science, Math Electives (6); MCom 160 (2); CSc 212 (1); Stat 341 (3); Total 18.

‡Technical Geography — Foreign Language **(Credits)**

Advanced Foreign Language (12); MCom 160 (2); CSc 212 (1); Stat 341 (3); Total 18.

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 212 and Stat 341 for a total of 18 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, and 484 in their 18 hours of . upper-division coursework in the major.

Undergraduate Courses

131 Physical Geography I 4(3,2) F

The earth in terms of its basic physical state. Location, navigation, geodesy, astrogeography, weather and climate.

132 Physical Geography II 4(3,2) S

The earth in terms of its basic physical state. Vegetation, soils, landforms and cartography.

200 Intro to Human Geography 3(3,0) FS
The differentiation of the world. Geographical limitations on human kinds behavior and systems of political and economic life with emphasis in understanding the contemporary culture map of the world.

210 World Regional Geography 3(3,0) FS
The differentiation of the world in terms of both natural and human environmental features and characteristics on a regional basis.

212 Geography of North America 3(3,0) S
The U.S. and Canada. Physical features and human phenomenon are examined in terms of their contribution to the area.

219 Geography of S.D. 3(3,0) F
Physical and human geography of the state, the inter-relationship and significance of various regions within the state and to the U.S.

310 Soil Geography and Land-use Interpretation 3 or 4(3,0 or 3,2) F
See Plant Science section. May count toward Geography major.

313 Geography of Latin America 3(3,0) F
Natural and geographic regions of Mexico, Central America, Caribbean Islands, and the South American Republics. The human factor and its reaction to the conditions of environment.

314 Geography of the U.S.S.R. 3(3,0) S
Appraisal of the physical resource base of Russia and estimates of industrial and agricultural strengths.

315 Geography of Europe 3(3,0) F
Regional and topical analysis of the geography of western Europe. Special concentration on the British Isles, Northern Europe, Low Countries, France and Mediterranean Europe.

316 Geography of Asia 3(3,0) F
Asian nations, physical and cultural environments, their role in world relations.

317 Geography of Africa 3(3,0) S
Major natural regions of the African Continent of emerging nations. Activities and customs of the native tribes and how they have responded to European influences. Africa's position as a storehouse of raw materials.

337 Atmospheric Sciences 3(3,0) S
Systematic methodological investigation of the meteorological elements (weather, climate, altitude, etc.) and their effects on geographic features.

338 Astrogeography 2(2,0) S
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) F
Surface features. Continental landforms with their flood-plains, deltas, lacustrine, glaciers, coastal plains, marshes and dunes. One's relations to these landforms will be emphasized.

351 Economic Geography 3(3,0) F or S
World wide distribution of economic activities and their physical bases. Agriculture, mining and manufacturing industries and their important commercial products and role in world trade.

363 Rural Geography 3(3,0) F or S
Character of American countryside as shaped by private and public decision-making processes. Case studies of major U.S. and European rural planning efforts to understand the present landscape and the problems of rural populations.

365 Settlement & Land Inventory Analysis 3(3,0) F or S
Geographical patterns of human 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.

380 Field Experience: (Topical) 1-6 FSSu
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.

382 Geographic Research Methods 3(3,0) F or S
General methods of geographic research. Includes library research, interviews, data collection, analysis, observation. Development of a research topic, methods of investigation and preparation of a research paper.

383 Cartography 3(3,0) FS
History and principles of cartography. Emphasis on field mapping; map projections; cartographic design; map interpretations; and exercises in map making.

390 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.

393 Directed Studies in Selective Topics 1-9 FSSu
Students interested in studying a certain topic or acquiring a particular skill in which a faculty member is competent but which is not covered by regular courses at SDSU, may undertake a program of directed study. The work will be planned and implemented by the student and the instructor, with department head approval.

396 Undergraduate Course Specials: (Topical) 1-5 FSSu
Ten or more students who wish to study a topic in which a faculty member is competent but which is not covered by regular courses at SDSU may propose a special.

400 Advanced Cultural Geography 3(3,0) F
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.

447 Geography of the Future 3(3,0) S
The world, particularly the U.S. in the year 2000 A.D. Special emphasis on such areas as population, urban life, transportation, food, social and cultural developments and alternative futures.

454 Industrial & Commercial Site Selection (3,0) FS
Analysis of geographic factors involved in selection of locations and sites for manufacturing, commercial and agricultural enterprises.

461 Urban Geography 3(3,0) F
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 of S.D. 3(3,0) FS
Historical periods of the state and adjacent areas portrayed against geographical background. May be taken as Hist 476 for History credit.

481 Field Methods in Geography 3(3,0) F
Methods and techniques in studying geography in the field. Map and photo interpretation, reconnaissance mapping, surveying and land use evaluation.

483 Air Photo Interpretation 3(3,0) F
Development of skills and techniques involved in the interpretation of aerial photographs showing physiography, land use, industrial, commerical and military functions. P, Geo 383 or consent.

484 Remote Sensing 3(3,0) S
Applications of remote sensing. Development of remote sensing: Instrumentation; and techniques and methodology that will aid in the determination of need and proper utilization of our physical and cultural resources. P, 483 or consent.

485 Quantitative Methods in Geog 3(3,0) S
Statistical methods and techniques and applications of these in the study of geographic phenomena such as climatic data, population geography, economic geography.

486 Computer Mapping 3(3,0) S
Computer mapping as a tool in the preparation of maps or diagrams and in geographical analysis of maps and diagrams. Will include consideration of various mapping programs. P, Algebra course, and Geo 383 or consent.

494 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 his/her education, may enroll for the receive between 3 and 12 credits at a maximum rate of one credit per week. (See course description on page 35 Arts and Science College Section.) P, Junior standing.

GRADUATE COURSES

503-603 Evolution of Geographic Thought 2(2,0) F
History and development of geography and its theories, schools of thought and current ideas.

506-606 Seminar in Systematic Geography: (Topical) 1-4 FS
Will deal with one or more aspects of human, economic, physical, population and historical geography or techniques. May be repeated for credit. The specific topic to be studied will change each semester.

520-620 Advanced Regional Studies in Geography (Topical) 1-4 FS
Selected topics in the regional geography of continents, nations, or states. May be repeated for credit. Specific topic to be studied will change each semester.

560-660 Social Demography 2(2,0) F
(See Sociology 666)

700 Seminar in Geography 1-4

765 Advanced Studies in Land Utilization: (Topical) 1-4 FS

788 Advanced Geographic Techniques: (Topical) 1-4(1-4,0) FS

790 Thesis in Geography: M.S. 1-6
As Arranged.

791 Seminar in Anthropology 1-4
(See Anthropology 791)

792 Special Problems in Geography: (Topical) 1-4

Health, Physical Education and Recreation (HPER)

College of Arts and Science

Professor Forsyth, Head; Professors Blazey, Huether, Williamson, Professor Emeriti Crabbs, Robinson; Associate Professors Booher, Marske, McKeown, Oien, Richardson; Assistant Professors Gregory, Looney, Instructors DeDeyn, Erickson, Haensel, Hoffman, Ingram, Ireland, Iverson, Snyder, Manning, Moran, Olson, Randklev, Shay, Underwood, Zulk; Professor in Cardiac Rehabilitation, Roberts; Professors of Sports Medicine, Billion, Lushbough, Shaskey, Tesch, Wait.

The program may be divided into four categories. While the four phases are related, each has a unique purpose. Some courses and programs in HPER carry the designations "Women" or "Men". These designations are utilized to indicate the specialized nature of the course or program but do not preclude the enrollment of the opposite sex.

Fitness and Lifetime Activities

Two one-credit courses in fitness and lifetime activities are required of all students. The courses are designed to develop intellectual inquiry as to the need of physical activity and to present the opportunity for you to learn skills in carry-over activities to promote physical, social and emotional well being. Two additional one-credit courses may be elected and such credits will count toward graduation. **No activities may be repeated.** Majors in HPER will substitute the major professional skills courses for the physical education requirement. The following activities are offered under PE 100 for both men and women:

Adaptives, Archery, Badminton, Bait & Fly casting, Ballet, Basketball, Body Conditioning, Body Mechanics, Bowling, Cycling, Dance, Fencing, Field Hockey, Ice Skating, Individualized Fitness, Jogging, Judo, Karate, Project Adventure, Recreational Activities, Racquetball, Skiing, Soccer, Softball, Speedball, Spring Board Diving, Swimming, Synchronized Swimming, Scuba, Tennis, Team Handball, Touch Football, Track & Field, Trampoline, Tumbling, Volleyball, Water Polo, Water Skiing, Weight Training, Wrestling.

Opportunities for learning Fitness & Lifetime Activities at an advanced level are offered under PE 200, for both men and women. These offerings may not be substituted for the PE 100 required courses.

Students enrolled in Fitness and Lifetime Activities are required to purchase a standard uniform and provide gym shoes. Uniforms can be purchased after arrival on campus.

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 ten sports for women and ten sports for men. SDSU is a charter member of the Association for Intercollegiate Athletics for Women (National, Region 6, and SD). Women may compete in cross country, indoor track and field, outdoor track and field, volleyball, basketball, swimming, gymnastics, golf, tennis and softball.

SDSU is a charter member of the North Central Intercollegiate Athletic Conference and a long-time member of the National Collegiate Athletic Association. Men may compete in cross country, indoor track and field, outdoor track and field, football, basketball, swimming, wrestling, golf, tennis and baseball.

The Athletic, Intramural and Recreation Committee, composed of students, faculty, administrators and alumni, serves in an advisory capacity to the Athletic Director and the President.

Professional Preparation in Health, Physical Education and Recreation

This program includes the undergraduate teaching major in Health, Physical Education and Recreation. Other programs offered are athletic coaching concentration, physical therapy major, public recreation minor, health education minor, dance education minor, athletic training minor, and graduate Health, Physical Education, and Recreation. Proficiency in a variety of physical education skills is required. All majors must pass a physical fitness proficiency test. A professional uniform is required of all major and minor students.

Course Cross Referencing

The department cross references courses with other consenting departments within the university. Students may use the prefix of the course which is most advantageous to their desired preparation. The course description contains a statement referring to the course with which it is cross referenced.

Health, Physical Education & Recreation Major

You may earn either a Bachelor of Arts or a Bachelor of Science degree by completing the curriculum outlined on the following pages. Since these curricula are designed primarily for persons who plan to enter the teaching field, you are urged to choose elective courses which will qualify you to teach courses in academic fields as well as in physical education. (See suggested minors in teacher education fields under the Education Department.) A student with a GPA of 2.2 or better may petition the head of HPER Department to graduate with a non-teaching major.

To teach in S.D. you must also meet certification standards established by the Division of Elementary and Secondary Education, Pierre, South Dakota.

The department screening committee must approve all students desiring to begin professional preparation in Health, Physical Education and Recreation. This committee reviews yearly the academic progress of departmental students at the end of each semester and recommends probation status or termination where necessary.

Public Recreation Major

The B.A. or B.S. Degree may be earned by completing the curriculum outlined on the following pages. Programs are based on an interdisciplinary approach providing a broad, comprehensive background for leadership and administrative roles in the recreation profession. All students transferring into the Public Recreation major from within the university or from another institution will be evaluated on an individual basis by a departmental screening committee. Transfer students must have a 2 point GPA to be accepted into the Public Recreation major program. Transfer students with less than a 2 point GPA may petition for approval. If accepted, the transfer

student will enter on probation for one semester. A Public Recreation major must have a 2.4 cumulative GPA to be recommended for the required 8-week internship experience. Four options are available for intensive study in the major: Agency, Commercial, Outdoor and Therapeutic.

Public Recreation Minor

A minor may be earned by completing 22 semester hours within departmental offerings. The following courses are required: Recr 230, 241, 360, 370, 440, PR 201, and PE 121. Recreation minor students will be counseled in selecting eight semester hours of course work from the suggested elective list.

Dance Education Minor: (Danc)

24 hours must be completed for the minor. 18 hours in Dance Education are required plus 6 hours of elected courses in the related fields of music, theatre, and art. Speech, Art, and Music majors must take the six elected courses in subjects other than their majors. Certain dance courses are offered on alternate years. (See course descriptions.) The coordinator of dance education will aid students in the use of variable credit courses and in the choice of electives necessary for completion of the dance minor.

Athletic Training Minor

A program devised to provide students majoring in any area the opportunity to become more competent in athletic training. Administrators of school systems at all levels are searching for qualified personnel to aid in this phase of health care for their students participating in athletic, intramural and recreational activities.

Courses required for completion of the athletic training minor include: Zool 221, NFS 111, HPER 351, 352, 354, 360, 361, 362, 363, 364, 450, 454, and HPER 482 or Zool 325, Psyc 101, Hlth 102 or 212, and one additional psychology course. The completion of the athletic training minor will qualify students to take the certification examination given by the National Athletic Trainers Association.

Students interested in completing the athletic training minor must submit an application for permission to enroll in course work in this area to the coordinator of athletic training prior to attaining junior status.

Athletic Coaching Concentration

Some states, among them S.D., Ia., and Mn., have a certification requirement for athletic coaching in public schools. You may be certified to coach by earning either a major in physical education or by completing the following courses: PE 354, HPER 440, PE 351, PE 450 and Zool 221. In addition, four semester hours are required in PE 470. Five hours of health courses are required and may be selected from the following: Hlth 102, 212, 460, 463, SeEd 591.

This curriculum is designed for preparation of athletic coaches, and is not recognized by the SDSU HPER Department as adequate preparation for the teaching of physical education.

Elementary Physical Education Concentration

Students desiring endorsement in Elementary Physical Education must complete the following courses: PE 359, PE 360, Danc 130, Danc 131, Danc 132, CDFR 211, HPER 482, SeEd 287, Hlth 212, Hlth 360, SeEd 591, HPER-Selected Skill Block Courses.

Health Education Minor (Hlth)

Students interested in preparing to teach health education may secure a strong minor by completing a minimum 29 semester hours in HPER, Health Education and related fields.

Required courses are Hlth 102, 212, 369, 443, 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, 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, 352, 450; Psyc 101; HPER 482 (Seminar in Methods and Materials in the Conduct of Adult Fitness and Cardiac Rehabilitation Programs).

Physical Therapy Major

A program designed to prepare students to enter a professional curriculum in Physical Therapy. The department provides counseling service to assist each student in developing a plan best suited to his or her needs. Acceptance by physical therapy schools is on a competitive basis; therefore a strong undergraduate academic record is essential. Students may prepare themselves in Physical Therapy by pursuing one of the following options.

OPTION 1: Students complete a Bachelor's degree from this 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 or 191	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 131-1 or 131-2 or 132-1 or 132-2 or 230 or 231 or 232 or 331 or 332	1		1
Recreational Leadership, Recr 360 or Recr 241 Intro. to Pub. Rec.	2	or	2
Community Health, Hlth 102 or Contemp Health Problems, Hlth 212	2	or	2
Fund of Dance, Dance 130	1	or	1
Swimming, PE 320	1	or	1
Humanities, Social Science, or Natural Science electives			

Sophomore Year	F		S
Gen Psychology, Psyc 101	3	or	3
*Skills, PE 131-1 or 131-2 or 132-1 132-2 or 230 or 231, 232 or 332	1		1
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 sophomore 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

Freshman Year	Credit F		S
Fr Comp, Engl 101 or 191	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 131-1 or 131-2 or 132-1 or 132-2, or 230, or 231 or 232 or 331 or 332	1		1
Community Health, Hlth 102 or Contemp Health Problems, Hlth 212	3	or	2
Recreation Leadership, Recr 360 or Recr 241, Intro to Pub. Rec	2	or	2
Fund of Dance, Dance 130	1	or	1
Swimming, PE 320	1	or	1
Humanities & Social Science electives			

Sophomore Year	F		S
Gen Psychology, Psyc 101	3	or	3
*Skills, PE 131-1 or 131-2 or 132-1 or 132-2 or 230 or 231 or 232 or 331 or 332	1		1
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 sophomore 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	or	3
Coaching Theory electives	2		2
Skills PE 131-1, or 131-2, or 132-1 or 132-2, or 230, or 231 or 232 or 331 or 332	1		1

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 Teachihg, 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 consturning, lighting, make-up, and promotion of a dance event are included. May be repeated. P, Dance 120. No more than 6 credits in both 120-320.

130 Fundamental Dance & Rhythms 1(0,4)
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 International Folk Dance 1(0,2)
Folk dances from around the world, including cultural background, costumes, skill differences for elementary, middle and high school or adults. P, Danc 130.

230 Modern Dance I 1(0,2)
Techniques, composition and appreciation of modern dance.

231 Modern Dance II 1(0,2)
(Offered in 1982) Continued technical development plus consideration of movement quality as affected by time, space and energy. P, Danc 230.

240 Dance Composition 2(1,2) S
(Offered in 1983) 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.

330 Dance Forms 2(1,2) S
(Offered in 1984) Laboratory experience in theatrical forms of dance not included in other courses. Will include units in ballet, jazz, ethnic and tap dance.

340 History and Theory of Dance 2(2,0) S
(Offered in 1984) Intensive study of dance history, theory and philosophy.

385 Directed Studies 1-5
See HPER 385

420 Techniques of Teaching Dance 2(1,2) F
(Offered in 1984) 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.

485 Undergraduate Course Specials 1-5
See HPER 485.

491 Problems in Dance 1-3
See HPER 491.

494 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu
See HPER 494

Graduate Course

581-681 Workshops in Dance Ed 1-3
See HPER 581-681.

Health Education (Hlth)

All courses listed with the Hlth prefix are cross-referenced with the same number in the Health Science Department (HSc) with that prefix.

Undergraduate Courses

102 Community Health 2(2,0) FS
See HSc 102

141 Intro to the Health Profession 2(2,0) F
See HSc 141

159 Emergency Medical Care 2(2,1)
To develop or upgrade the skill levels of individuals involved in emergency medical care services. Introduction to basic anatomy, physiology and emergency medical care for students planning a career in the health sciences.

212 Contemporary Health Problems 2(2,0) FS
See HSc 212

252 Disaster Preparedness 1(1,0) FS
See HSc 252

260 Standard First Aid — Instructor 1(1,1)
First aid knowledge and skills necessary to care for most injuries, to meet most emergencies and also provides accident prevention information. You will receive the Instructor Training Course which will qualify you to teach the Standard First Aid and Personal Safety Course.

261 Instructor's Course in Home Nursing 1 S
See HSc 261

302 Family Health 2(2,0) S
See HSc 302

360 Advanced First Aid — Emergency Care 2(2,1)
Instruction for those who are in a position to provide first aid and emergency care frequently. Provides essential knowledge and skills needed to develop the functional first aid capabilities required by nurses, teachers, athletic trainers, crisis team personnel, policemen, firemen, emergency squad and rescue squad members, ambulance attendants, and other special interest groups. You must be 18 or older.

385 Directed Studies 1-9
See HPER 385

432 Occupational Health 2(2,0) FS
See HSc 432

440 Epidemiology 3(3,0) S
See HSc 440

443 Public Health Services 3(3,0) FS
See HSc 443

460 Health & Safety Education 2(2,0) F
Curriculum content at elementary and secondary levels. Methods of presentation including direct, correlated, and integrated health instruction. Organization of health and safety education. P, junior standing.

483 Methods & Materials in Health Education 3(2,3) FS
See HSc 463

485 Undergraduate Course Specials 1-5
See HPER 485

491 Problems in Health Education
See HPER 491

494 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
Methods of health instruction; problems of health service; problems in supervision of health environment; recent trends in safety education. P, graduate standing, permission of staff.

Health, Physical Education & Recreation (HPER) Major Theory Courses

Undergraduate Courses

240 Prin & History of HPER 3(3,0) F
Aims and objectives of physical education. Biological, sociological, psychological, mechanical, and historical foundations.

385 Directed Studies 1-9
See description under Directed Studies Program in the Alternatives and Options for the College of Arts and Science.

440 Organization & Administration of HPER 3(3,0) FS
Curricula, intramural and athletic programs. Administration of facilities, equipment and budgets. P, junior standing.

451 Tests & Measurements in HPER 2(2,1) FS
Place of measurement in physical education. Analytical survey of tests and measures available; statistical approach, techniques and procedures in planning and administering tests and measurements. P, junior standing.

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

485 Undergraduate Course Specials 1-5
See description under Undergraduate Course Specials in the Alternatives and Options for the College of Arts and Science.

491 Problems in HPER 1-3 FS
Directed studies and/or research activities related to HPER. P, consent.

494 Cooperative Education/Internship/Field Experience 3-12 3(3,0) FS
See description in College of Arts & Sciences.

Graduate Courses

581-681 Workshops in HPER 1-3
Lectures, conferences, committee work, and outside assignments to increase understanding of a specific area. P, Junior standing, consent.

582-682 Seminars in HPER 2(2,0) SSu
P, graduate standing, permission of staff.

741 Philosophy of HPER 3(3,0) SSu

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

743 Basic Issues in HPER 3(3,0) SSu

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

751 Advanced Evaluation of HPER 3(3,0) SSu

760 Motor Learning & Development 3(2,2) FSu

783 Research Methods in HPER 3(3,0) FSu

790 Thesis in HPER 5-7 as arranged

792 Individual Research & Study in HPER 1-4 credits FSSu

Physical Education (PE) Men and Women

Undergraduate Courses

100 Fitness & Lifetime Activities 1(0,2) FSSu
Activities stressing individual, team and physical fitness according to student needs and interests.

121 Swimmer Swimming 1(0,2) FSSu
Water safety and the nine basic swimming strokes. P, pass qualifying swimming test. May not substitute for PE 100.

200 Fitness & Lifetime Activities (Intermediate) 1(0,2) FSSu
Advanced instruction in courses such as golf, tennis, and archery. Theory and practice of such activities. May not substitute for PE 100.

223 Synchronized Swimming 1(0,2) FSSu
Basic skills, methods, materials and techniques for teaching and coaching synchronized swimming. May not substitute for PE 100.

320 Advanced Life Saving 1(0,2) FSSu
Basic skills, knowledge, attitudes and conditions of life saving. Participation may lead to American Red Cross Senior Life Saving certification. P, pass qualifying swimming test. May not substitute for PE 100.

321 Water Safety Instructor Part I & II 2(1,2) FSSu
Method of instruction and evaluation of water safety techniques. Participation may lead to American Red Cross water Safety instructor's certification Part I and II. May not substitute for PE 100. P, PE 320 or current Red Cross Life Saving Certificate.

322 Water Safety Instructor of the Handicapped 1(0,2) FSSu
Method of instruction and evaluation of water safety techniques for the atypical. May lead to the American Red Cross Water Safety Instructor's certification. May not substitute for PE 100. P, 321, or current Water Safety Instructor certificate.

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

351 Kinesiology 3(3,0) FSSu
Mechanics and muscular actions related to movement of the human body. P, Zool 221 or 325, junior standing.

352 Adaptive Phys Ed 2(2,0) S
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) FS
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) FS
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.

385 Directed Studies 1-9
See HPER 385

450 Exercise Physiology 3(2,2) FSSu
Body processes and exercise; efficiency of muscular, work, fatigue and exercise; age, sex and body type as related to exercise; nervous control of muscular activity; effect of exercise on the circulatory system. P, junior standing.

460 Methods of Teaching Phys Ed 2(2,0) FS
Curriculum planning, principles of motor learning, methods used in teaching various activities in physical education. P, junior standing.

494 Cooperative Education/Internship/Field Experience Topical 1-12 FSSu
See HPER 494

Coaching of Interschool Athletics

Sectionized courses in coaching of football, basketball, field hockey, volleyball, cross country, track and field, gymnastics, swimming, wrestling, tennis, baseball, softball, and golf.

470 Coaching & Officiating of Athletics 2(2,1)
Theory and practice of individual fundamentals and team strategies. Organization and management procedures specific to each sport. Textbook work, lectures, visual aids, demonstrations. Techniques of officiating. P, junior standing.

Professional Skills for Majors

131-332 Professional Skills 1(0,2) FS
Majors are given adequate preparation in performing activities essential to teaching Physical Education. Proficiency in performance and knowledge of each skill will be examined.

131 (M) Section 1 — Softball, Basketball
(M) Section 2 — Wrestling, Racquet Sports
132 (W) Section 1 — Field Hockey, Racquet Sports
(W) Section 2 — Volleyball, Field Sports
230 (M&W) Recreational Activities, Golf, Archery
231 (M) Field Sports, and Volleyball
232 (W) Softball, Basketball
331 (M&W) Gymnastics, Tumbling 2(0-4)
332 (M&W) Tennis, Individualized Fitness
Danc 130 Fundamentals of Dance

Graduate Courses

560-660 Methods & Materials for Elementary Phys Ed 2(2,0) Su
Analysis of activities, materials, techniques and methods used in physical education for elementary grades. Progression in curriculum planning in areas of dance, games, self-testing, and movement exploration. P, graduate standing.

581-681 Aquatics Workshop 1-3
Specific areas, lectures, conferences, committee work, and outside assignments to increase understanding of a specific area in aquatics. May not substitute for PE 100. P, junior standing and consent.

750 Scientific Basis of Phys Ed 2(2,0) SSu

770 Advanced Administration of Interschool Athletics 2(2,0) Su

771 Current Trends in Athletics 3(3,0) Su

Physical Therapy (PT)

Undergraduate Courses

102 Community Health 2(2,0) FS
See HSc 102

142 Intro of Physical Therapy 1(1,0) F
Acquaints the beginning major student with all aspects of the profession of physical therapy.

212 Contemporary Health Problems 2(2,0) FS
See HSc 212

260 Standard First Aid — Instructor 1(1,1)
See Hlth 260

322 Water Safety Instructor of the Handicapped 1(0,2)
See PE 322

351 Kinesiology 3(3,0) FS
See PE 351

352 Adaptive Phys Ed 2(2,0) FS
See PE 352

354 Prevention & Care of Athletic Injuries 2(2,1) FSSu
See PE 354

360 Advanced First Aid — Emergency Care 2(2,1)
See Hlth 360

361 Athletic Training Techniques I (Fall Sports) 2(1,4) F
Lectures, problem conferences, demonstrations, and practical athletic training experiences. Learning, practicing, and applying athletic training techniques related to preventive, protective, and emergency care measure for athletic participants. Practical experience gained by assisting in all varsity sports athletic training programs for women and men. P, PT 354 and consent.

362 Athletic Training Techniques II (Spring Sports) 2(1,4) S
See PT 361. P, PT 354 and consent.

363 Athletic Training — Clinical Experiences I 2(1,4) F
Provides junior and senior student trainers supervision of conditioning and rehabilitation programs; to evaluate severity in athletic injuries; to administer physical therapy modalities; supervise an athletic training room; and to instruct athletics, coaches and beginning student trainers in the techniques of sports medicine. Students will supervise the athletic training program for one varsity sport during the fall sports season. P, PT 354 and consent.

364 Athletic Training — Clinical Experiences II 2(1,4) S
See HPER/PT 363. P, PT 354 and consent.

385 Directed Studies 1-9
See HPER 385

450 Exercise Physiology 3(2,2) FSSu
See PE 450

451 Tests & Measurements in HPER 2(2,1) FS
See HPER 451

454 Medical Aspects of Athletic Training 2(2,1)
Specific problems relative to medical aspects of athletic training. Injury examination techniques, treatment modalities and techniques, therapeutic exercises, rehabilitation of injured athletes, athletic nutrition, doctor-trainer-coach relationships, budgeting and administration of an athletic training program. P, 361, 362, 363 or 364 and consent.

494 Cooperative Education/Internship/Field Experience 1-12 hours FSSu
See HPER 494

Graduate Courses

581-681 Workshops in HPER 1-3
See HPER 681

582-682 Seminars 2(2,0) FSSu
See HPER 682

790 Thesis 1-7 as arranged
See HPER 797

792 Individual Research & Study 3 credits FSSu
See HPER 792

Recreation (Recr)

Undergraduate Courses

230 Professional Skills 1(0,2) FS
See Professional Skills for Majors

241 Intro to Public Recreation 2(2,0) F
Historical background of recreation and use of leisure time. The Recreation and Park movement, governmental responsibilities and current trends will be stressed.

330 Therapeutic Recreation 2(3,0) F (every other year)
Theoretical and philosophical foundations of therapeutic recreation, behavioral, therapeutic use of activity; recreative interaction-intervention techniques; survey of major services and agencies. P, junior or senior standing, Recr 241.

341 Outdoor Recreation 2(2,0) S
Development of outdoor recreation ethic, its history, philosophy, leaders, and the justification, allocation and distribution of natural resources for recreation.

342 Intramural & Recreational Sports Administration
P, sophomore standing.

350 Sailing and Canoeing 2(2,2) F
Water Safety Techniques related to small craft. Basic skills and techniques important in the recreational use of canoes, sail boats, outboard boating, and rowing. P, Recr. 121.

351 Recreation Facilities 2(2,0) S (every other year)
An introduction to the principles and practices of planning, financing, management and maintenance of recreation facilities. P, junior or senior standing, Recr 241.

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, Jr. or Senior standing, Recr 241.

385 Directed Studies 1-9
See HPER 385

440 Community Recreation 3(3,0) S
Organization and administration of community recreation, program planning and recreational program areas. P, junior or senior standing, Recr 241

482 Senior Seminar 2 credits
See HPER 482

485 Undergraduate Course Specials 1-5
See HPER 485

491 Problems in Recreation 1-3
See HPER 491

494 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu
See HPER 494

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 or 191	3	or	3
Intro Biology, Bio 151, 153	3		3
Intro to Public Rec, Recr 241	2		
Algebra, Math 111	3	or	3
Rec Activities & Golf, Recr 230	1	or	1
Fund of Dance, Dance 130	1	or	1
Fund of Speech, SpCm 101	3	or	3
Rec Leadership, Recr 360			2
Individual & the Family, CDFR 141	2	or	2
Blues, Jazz & Rock Survey, Mus 300	2	or	2
Woodworking, IA 191	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Design Fundamentals, Arts 123	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 Adm & Organization, PR 201	3	or	3
Prin of Econ I, Econ 201	3	or	3
Tennis & Individual Fitness, PE 332	1	or	1
Swimmer Swimming, PE 121	1	or	1
Gen Psychology, Psyc 101	3	or	3
Intro to Philosophy, Phil 205	4	or	4
Physical Geography, Geog 131	4	or	4
Chem & Mankind, Chem 100	4	or	4
Social Problems, Soc 150	2	or	2
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, B-Ad 350	3	or	3
Advanced First-Aid-Emergency Care, Hlth 360	2	or	2
Directed Studies/Recreation Crafts, Recr 385	2	or	2
Community Recreation, Recr 440			3
Problems in Recreation, Recr 491	3		3
Suggested Electives			
Senior Year	**F**		**S**
State & Local Government, PolS 210	3		
Stagecraft, Thea 141	3	or	3
Publicity Methods, MCom 313	2		
Sailing and Canoeing, Recr 350	2		
11Sr Seminar in Rec, HPER 482			2
Field Experience & Student Internship, Recr 494			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 or 191	3	or	3
Foreign Language	4		4
Intro to Public Rec, Recr 241	2		
Rec Activities & Golf, Recr 230	1	or	1
Fund of Dance, Danc 130	1	or	1
Fund of Speech, SpCm 101	3	or	3
Rec Leadership, Recr 360			2
Woodworking, IA 191	3	or	3
Individual & the Family, CDFR 141	2	or	2
Blues, Jazz & Rock Survey, Mus 300	2	or	2
Math Elective	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Design Fundamentals, ArtS 122	2		
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
Park Adm & Organ., PR 201	3		
Prin of Econ I, Econ 201	3	or	3
Tennis & Individual Fitness, PE 332	1	or	1
Swimmer Swimming, PE 121	1	or	1
Social Problems, Soc 150	2	or	2
Gen Psychology, Psyc 101	3	or	3
Intro to Philosophy, Phil 205	4	or	4
Foreign Language	3		3
Humanities, Social Science, Natural Science electives	4		4

Junior Year
Same as Bachelor of Science degree curriculum.

Senior Year
Same as Bachelor of Science degree curriculum.

Health Science (HSc)

College of Nursing

Professor Blazey, head; Professor Michalewicz

The Public Health Science curriculum provides training in administration, community health education, food sanitation and environmental health. Successful completion of the program leads to a Bachelor of Science degree.

The training programs are designed by the department to provide sufficient flexibility to move into many career areas. The student with this degree may pursue graduate work in the same or a related field.

The curriculum uses courses from throughout the university which provide a broad, comprehensive background in technical fields and in communication skills, humanities, and social sciences.

A Health Science minor is offered for those who wish to obtain competencies in health knowledge, health services and healthful environment. The minor may be obtained by completing 18 semester hours including CDFR 211 and 342; HSc 102, 212, Hlth 360, HSc 432, 443, and 463 and nine hours of biological science. All minors must consult the head of the Health Science Department for approval.

Curriculum in Public Health Science

Required Courses Leading to the Bachelor of Science degree

	Credit	
Freshman Year	**F**	**S**
Algebra, Math 111		3
Biology, Bio 151	3	
Fr Comp, Engl 100, 101 or 191	3	
Intro to Sociology, Soc 100	3	
Gen Chem, Chem 110 or 114	4	
Gen Chem, Chem 114 (115-1 cr)		4
Community Health, HSc 102	2	
Fund of Speech, SpCm 101	3	
Intro to the Health Professions, HSc 141		2
Fitness & Lifetime Activities, PE 100	1	1
*Non-technical electives;	1	3
Sophomore Year	**F**	**S**
Gen Microbiology, Micr 231	4	
****Elementary Physics I-II, Phys 111, 113	4	4
Intro to Entomology, Ent 105	3	
**Elementary Organic Chem, Chem 120		4
Comtemp Health Problems, HSc 212	2	
Prin of Econ I, Econ 201		3
Gen Psychology, Psyc 101		3
*Non-technical electives	4	3
Junior Year	**F**	**S**
Junior Comp, Engl 300	3	
Statistical Methods I, Stat 341	3	
Human Nutrition, NFS 321	3	
Environmental Microbiology, Micr 310		4
Methods & Materials of Health Instruction, HSc 463	3	
Technical Electives	5	5
*Non-technical electives		4
Senior Year	**F**	**S**
Public Health Science, HSc 443	3	
Occupational Health, HSc 432	2	
Epidemiology, HSc 440		3
Pathogenic Microbiology, Micr 423	4	
Immunology, Micr 422		3
***Workshop or Practicum, HSc 442		1
Technical Electives	8	6

*15 credits of non-technical electives of which 9 semester credits will be in the social sciences and 6 semester hours in the humanities selected from the representative list.
**Chem 326-328 Organic Chemistry is recommended for students planning to take graduate work.
***Practicum of four semester hours required for community health emphasis.
****CSc 112 may be substituted for Physics 113.

Suggested Technical Electives	**Credits**
Am Government Issues & Policies, PolS 204	3
Anatomy, Zool 221	2
Audio-Visual Methods & Materials, SeEd 405	2
Business Law I, B-Ad 350	3
Business Law II, B-Ad 351	3
Dairy Foods, DS 231	3
Dairy Microbiology, DS 301	3
Drug, Alcohol & Tobacco Workshop, HPER 492	2
Educational Measurement, EdEr 415	2
Elementary Biochem, Chem 260	4
Emergency Medical Care, Hlth 159	2
Environmental Chem, CE 380	3
Environmental Engineering, CE 523	3
Food Microbiology, Micro 311	3
Fund of Organic Chem, Chem 224	4
Gen Parasitology, Zool 467	3
Genetics, Bio 371	3
Household Pest Control, Ent 191	2
Human Development & Personality, CDFR 211	2
Individualized Fitness, PE 332	1
Industrial Waste Treatment, CE 524	2
Institutional Organization & Management, NFS 391	2
Medical Entomology, Ent 393	3
Newswriting, MCom 210	3
Physiological Chem, Chem 364	4
Prin of Accounting I, Actg 210	3
Prin of Accounting II, Actg 211	3
Prin of Guidance, CGPS 412	2
Public Administration, PolS 320	3
Quantitative Analysis, Chem 232	4
Seminar, Death & Dying, HSc 442	1-4
Seminar, Health Planning, HSc 442	1-4
Seminar, Perspectives in Aging, HSc 442	1-4
Senior Seminar in Health Education, HPER 482	2
Social Psychology, Psyc 441	3

Undergraduate Courses

102 Community Health 2(2,0) FS
Emphasis on promotion of good health in areas of immediate concern to the young adult. Open to all students.

141 Intro to the Health Professions 2(2,0) F
Composite of health professions, including functions, responsibilities and effect upon society. Emphasis on medical- nursing- dentistry- environmental- pharmacy and other allied health professions. Open to all students in health science and other health related fields; together with Health/PT 159 constitutes the primary core curriculum for all health care students.

212 Contemporary Health Problems 2(2,0) FS
Health problems men & women will encounter as a community member. Open to all.

252 Disaster Preparedness 2(2,0) FS
Basic philosophy, fundamental principles of civil defense; citizen's role in emergency planning for non-military national defense. Open to all students.

261 Instructor's Course in Home Nursing 1 S
Workshop of 36 hours in effective methods of teaching home care of the sick. Limited to 14 students. P, consent.

302 Family Health 2(2,0) S
(Taught first half of semester) Planning for promotion of family health. Open to all students.

432 Occupational Health 2(2,0) FS
(On sufficient demand) Industrial hygiene and environmental sanitation; influence of occupation upon health, legal regulation, inspection and control, union health services, size and scope of modern industrial health program, application of public health principles and medical nursing and engineering practice to places of employment, relationship to community health program. P, junior or senior.

440 Epidemiology 3(3,0) S
Basic principles applicable to infectious and non-infectious disease; host-agent-environment complex; the factors influencing programs for their prevention and control. P, HSc 102 or HSc 212, consent and senior standing.

442 Seminar (1-4)
(On demand) Current research and studies emphasizing Public Health terminology, study of reports, and problems. Open to advanced students in Health Science and other health related fields.

443 Public Health Science 3(3,0) FS
Organization and administration of public and voluntary health agencies. Principle functions and program development in vital statistics, maternal-child health, adult health, sanitation, health education, and special health programs. Problem solving in fields of public health. Junior or senior standing in nursing. Open to upper division professional majors in health related fields.

452 Workshop 1-4

463 Methods & Materials in Health Instruction 3(2,3) FS
Observation and participation in various classroom techniques, preparation of unit and lesson plans, evaluation of participants and students and review of current source material. P, HSc 212, Psyc 101, 9 hours of biological sciences.

494 Cooperative Education/Internship/Field Experience 1-12 FSSu
Planned and supervised professional experience related to health science which takes place outside the formal classroom with private business, industry, or public agencies. P, consent of department program coordinator.

History (Hist)

College of Arts and Science

Professor Bell, head; Professor Sweeney; Professors Emeriti Parker, Volstorff; Associate Professors Crain, Funchion, Miller; Instructor Roberts

The courses in this department, in addition to their inherent cultural-intellectual value, are designed to give history majors a necessary background for advanced graduate work, professional training in law, teaching, or government service. The department's offerings are also intended to meet the needs of students majoring in the social sciences and the humanities and to serve the general education interests of the entire academic community.

The courses are grouped into two major areas — the U.S. and Europe. Courses are also offered in numerous other areas, such as Latin America and Russian to provide added enrichment to the program. It is suggested that history majors orient their upper division course work in either the American or European concentrations. Students who expect to teach American History must take 8 hours of American History in order to qualify for the S.D. teaching certificate.

Curriculum in Arts and Science, History Major

Leading to the Bachelor of Arts Degree

Composition & Speech **9**
Two semesters of English Composition, with a minimum of six semester hours: Engl 100, 101, or 191; & Jr Comp, Engl 300
One semester of Fundamentals of Speech with a minimum of three semester hours: SpCm 101

Fitness & Lifetime Activities **2**
Two semesters of Fitness & Lifetime Activities, with a minimum of two semester hours: HPER 100

Foreign Languages **14**
Number of required hours may be reduced by proficiency examination

Humanities **12**
Courses to be selected from the approved list and must be in at least two disciplines

Mathematics **3**

Natural Science **8**
Courses to be selected from the approved list must be in at least two disciplines and must include at least one laboratory course

Social Science **12**
Courses to be selected from the approved list must be in at least two disciplines.

History Major **29**
Three of the following four lower division courses: Hist 101 (3), 102 (3), 251 (3), 252 (3); and, 20 upper division credits in history to include Hist 380 (2). Total: 29 cr. hrs.

Electives **39**
Includes 29 hours of teacher education for prospective teachers

Total Hours **128**
Must include a minimum of 40 upper division credits (300 or 400 level courses)

Curriculum in Arts and Science, History Major

Leading to the Bachelor of Science Degree

Composition & Speech **9**
Two semesters of English Composition, with a minimum of six semester hours: Engl 100, 101, or 191 & Jr Comp, Engl 300

Fitness & Lifetime Activities **2**
Two semesters of Fitness & Lifetime Activities, with a minimum of two semester hours: HPER 100

Humanities **8**
Courses to be selected from the approved list and must be in at least two disciplines.

Mathematics **3**

Natural Science **14**
Courses to be selected from the approved list as follows: Biological Science (6), Physical Science (8)

Social Science **12**
Courses to be selected from the approved list in at least two disciplines.

History Major **29**
Three of the following four lower division courses: Hist 101 (3), 102 (3), 251 (3), 252 (3); and 20 upper division credits in history to include Hist 380 (2). Total: 29 cr.hrs.

Electives **51**
Includes 29 hours of teacher education for prospective teachers

Total Hours **128**
Must include a minimum of 40 upper division credits (300 or 400 level courses)

MINOR: Three of the following four lower division courses: Hist 101 (3), 102 (3), 251 (3), 252 (3); and nine additional credits, of which 6 must be in upper division courses. Total: 18 credit hours. NO GRADE BELOW A "C" IN HISTORY COURSES WILL BE COUNTED FOR A HISTORY MAJOR OR MINOR.

Undergraduate Courses

121 History of Western Civilization to 1650 3(3,0) FS
Introduction to the major developments, events, personalities in western civilization from prehistoric times through the Reformation.

122 History of Western Civilization since 1650 3(3,0) FS
Survey of western civilization from the Reformation to the present.

231 Technology and Society 2(2,0)
See GE 231. May satisfy history minor requirements with the approval of the department head.

251-252 American History Survey 3(3,0) FS
Main themes, events, and personalities of American history. Hist 251 covers period from 1492 to 1877; Hist 252 from 1877 to present.

260 American Military History 3(3,0)
A study of the art and science of military affairs as practiced by the United States. Includes an analysis of the part the armed forces play within American society. The relation between the armed forces and other government agencies will also be examined from the colonial period to the present.

265 History of the American West 3(3,0)
From exploration and colonization of North American continent through closing of the frontier. Includes routes of migration, cattle frontier, mining frontier, Indians, pioneer farmers, mechanized farming, urban frontier, and the effect of the frontier on the American character.

310 Topics in Latin American History 3(3,0)
A semester-long examination of a special topic in Latin American history. Topics include but are not limited to: Mexico; 20th Century Latin American Social Revolutions; Latin American Indian Civilizations; and U.S.-Latin American Relations.

311 History of the Far East 3(3,0)
Emphasis on penetration of European powers in the area during the 18th-19th centuries, and roles of Far Eastern nations in world politics in 20th century. (Not offered in 1980-1982)

313 The Near East 3(3,0)
Social, economic, cultural and political institutions of the Arab and Moslem world, with stress on relations of Near Eastern nations with the great colonial powers of the West. The period covered is primarily the 18th, 19th and 20th centuries.

322 Ancient History 3(3,0)
Greece and Rome. Emphasis on Greek culture and Athenian democracy, the rise and failure of the Roman Republic, the development and collapse of the Roman Empire; and the emergence of the Christian Church.

325 Medieval Europe 3(3,0)
Western Europe from 300-1400 A.D. Role of the church, feudalism, revival of cities, commercial revolution, rise of universities, development of nation states.

326 Renaissance & Reformation 3(3,0)
Political, social, economic, cultural, and religious changes in Europe from 1300 to 1600.

327 Early Modern Europe 3(3,0)
Europe from the Treaty of Westphalia to the French Revolution. The Age of Louis XIV, the Age of Reason, and the French Revolution. Social, economic, cultural and political forces of the 17th and 18th centuries that helped shape the modern world.

330 Topics in European History 3(3,0)
A semester-long examination of a special topic in modern European history. Topics include, but are not limited to: Scandinavia; Soviet Russia; Nazi Germany; Spain and Portugal; Ireland, and Christianity and the Roman Empire.

341-342 English History 3(3,0) FS
341 from Roman Britain to 1688; 342 traces the political and cultural history of the British Isles and the Empire from 1688 to the present.

345 History of Russia 3(3,0)
From the earliest times to present, with emphasis on background and history of Communist regime. Treats cultural and social as well as political aspects.

350 Colonial History of the U.S. 3(3,0)
Establishment of the British colonial empire in North America, settlement of the 13 colonies and the growth of the British American colonies to the end of the French and Indian Wars.

352 Revolutionary & Early National Period in U.S. History, 1763-1800 3(3,0)
Causes of the American Revolution, War for Independence, Articles of Confederation, Constitutional Convention of 1787, establishment of the Federal Union and early years of the Republic.

354 The Age of Jefferson and Jackson, 1800-1840 3(3,0)
Jefferson's administration, War of 1812, Jackson's administration.

355 Civil War & Reconstruction, 1840-1877 3(3,0)
Development of ante-bellum South; social, political, and economic factors leading up to outbreak of the Civil War; Reconstruction period and problems of the post war South.

356 The New Nationalism, 1877-1920 3(3,0)
Examination of political, economic, social, and cultural developments in the U.S. from 1877-1920. Emphasis on urban and industrial growth, reform movements, imperialism, war.

357 American Between The Wars, 1918-1941 3(3,0)
Major political, social, economic, and cultural developments in the U.S. during the crucial decades of the 1920s, 1930s.

358 The U.S. Since 1941 3(3,0)
Social, economic, and political change. The consequences, domestic and foreign, of global power and rising affluence.

360 Topics in American History 3(3,0)
A semester-long examination of a special topic in American history. Topics include, but are not limited to: Immigration; The Family; Urban American; Future Foreign Policy; and America in the 1920s and Depression and New Deal.

368 History of the American Indians 3(3,0)
American Indian history. Emphasis on the origins and early distribution of North American Indian cultures, the history of Indian-white contacts, the impact of federal Indian policy, persistence and change in American Indian cultures. (Satisfies the Teacher Preparation Program requirement of 3 credits of American Indian Studies.)

373 History of Rural America 3(3,0)
Development of American agriculture and rural life. Emphasis on the midwest experience. Topics include: government and railroad land policies; agricultural frontier and early settlement patterns; frontier crops; challenge of the prairie; impact of technical innovation, rural cooperatives, government agricultural policies and foreign markets; changing patterns of rural culture, politics and landscapes.

376 History of S.D. 3(3,0)
The land, people, and institutions of the state.

377 Economic History of the U.S. 3(3,0) F
Emphasis on economic factors but also correlated political and social developments, colonial period to present.

380 Methods & Philosophy of History 2(2,0) S
How historians research and write history. Also an account of attempts to explain larger meaning and directions of history. P, junior standing, required of majors.

393 Directed Studies in Selective Topics 1-9 FSSu
If you are interested in studying a certain topic or acquiring a particular skill in which a faculty member is competent but which is not covered by regular courses at SDSU, you may undertake a program of directed study. The work will be planned and implemented by you and the instructor, with department head approval.

394 Field Experience: (Topical) 1-6 FSSu
See Arts and Science section.

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

417-418 History of Latin America 3(3,0)
417, Native Indian populations of Latin America, colonization of the area by European powers, and general history of Latin America up to and including the wars of independence. 418 is a study of the national development of Mexico, Argentina, Chile, Brazil and Cuba in the 19th and 20th centuries.

421-422 Contemporary European History 3(3,0)
421 deals with Europe from 1919 to 1945, and 422 with Europe from 1945 to the present. Topics will include: the failure of the League of Nations, the rise of Fascism and Nazism, Communism, WW II, the Cold War, the UN, NATO, the Common Market, and political, economic, and cultural developments on the continent.

447 Modern Germany 3(3,0)
Examination of German history in the 19th and 20th centuries. Emphasis on the formation of the German nation, Bismarck, development of the German empire, WW I, rise of Hitler, Nazi Germany and WW II.

461-462 Constitutional History of the U.S. 3(3,0)
American constitutional and legal history from colonial times to the present. Relationship between the law and the social, economic, and political systems of society.

467-468 American Diplomatic History 3(3,0)
Detailed and interpretive analysis of American diplomatic history. 467 covers the years from 1492-1900; 468 from 1900 to 1976.

476 Historical Geography 3(3,0)
See Geog 476. May be used to satisfy history major with approval of department head.

492 Special Problems in History 1-2-3-4(1-2-3-4,0) FSSu
Opportunity for qualified students to investigate special problems or carry out independent study under supervision of department staff. Variable credit, may be repeated for up to 8 credits. P, Soph, Jr or Sr standing and consent.

494 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

516-616 History of Journalism
See Journalism (MCom 516-616)

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.

571-671 & 572-672 Cultural History of U.S. 3(3,0)
Development of American society and culture; changes in values, ideas, beliefs, institutions, behavior, arts, leisure, and material culture.

591-691 Conflicting Interpretations of American History 3(3,0)
Analysis of questions of historical interpretations in the field of U.S. history which are currently being debated by scholars.

592-692 Special Problems in History 1-3 FSSu
Selected studies for advanced students.

793 Seminar in History 1-3

Home Economics (HE)

College of Home Economics

Home Economics Staff

Undergraduate Courses

HE101 Field Experiences 1 Cr. FS
Participation in community experience during the freshman and sophomore year. Observations involving work ethics, interpersonal relations and use of resources. Focus on effective communication in the community. Course graded either "E" or "F".

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.

241 Management in Family and Personal Living 3(3,0) FS
Resource management related to the economic aspects of family decision-making.

361 Home Equipment 2(1,2) FS
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; labeling, advertising; consumer practices affecting cost; analysis of programs for consumer protection; the market structure. Principles of maximization of consumer satisfaction. P, junior standing or consent.

422 Family Resource Management Lab (1-3 Cr.) FS
Management concepts as related to families of varying structures and conditions. Experiences designed to meet individual professional needs. Can be taken concurrently with 1-3 credits of HE 443. Reservations and special fees required.

443 Special Problems 1-3 FS
Problems selected according to students' special needs and interests. Taken concurrently with HE 442. 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

482 Practicum in Extension FS 8 Cr.
Working under supervision in a county extension office. The role of the extension home economist, organization and philosophy of the Cooperative Extension Service, public relations, use of mass media, program development and teaching in extension with both youth and adults. Full-time one-half semester with residence in a county seat town. P, 2.2 GPA.

494 Professional Practicum 1-12 FSSu 8 Cr.
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. Full-time one-half semester with residence in city where business is located.

Graduate Courses

500-600 Practicum in Home Economics Related Occupations 2-6 cr.
501/601 Seminar 2 cr.
573/673 Special Problems 1-4 P, consent.
701 Seminar in Home Economics 5-2
790 Thesis 5-7 cr.
792 Problems in Home Economics 2
793 Individual Research and Study 5-7 cr.
794 Graduate Internship 5-7 cr.

Home Economics Education (HEd)

College of Home Economics

Professor Anderson, Head; Professor Gilbert; Associate Professor Kluckman; Assistant Professors Bell, Farris, Kluckman, 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 approved by the Division of Vocational and Technical Education of The Office of Education and the National Council for Accreditation of Teacher Education. During the senior year, home economics education and home economics extension majors participate in off-campus programs. Home economics education majors teach consumer homemaking and/or related occupations in public schools and take part in school and community activities for a period of one-half semester. Home economics extension majors spend a half semester working in a county extension office under the supervision of a county home economist. Students entering the teacher education programs must meet admission requirements of the Division of Education.

A grade of "C" or above must be earned in required courses in the College of Home Economics and Division of Education to be eligible for graduation with a major in Home Economics Education, Extension or Journalism. Journalism majors must also meet grade point requirements set by the Journalism Department.

Students should consult their advisor for current certification requirements.

The minor in the Home Economics Education Department is in Home Management and Consumer Studies. No minor is available in Home Economics Education or Home Economics Extension. The Home Management and Consumer Studies Minor consists of the following required 16 credits: HE 101, Field Experience (1 cr.); HE 241, Management in Family & Personal Living (3 cr.); HE 391, Consumers & the Market (3 cr.); HEd 401, Seminar (2 cr.); HEd 421, Experiences in Adult Education (2 cr.); and at least 5 credits from the following: HE 102, Managing Family Resources (2 cr.); HE 442, Home Management Lab (3 cr.); HE 443, Special Problems (1-3 cr.); HE 361, Home Equipment (2 cr.); HEd 461, Special Topics in Management Studies (1-3 cr.).

A. Home Economics.....75
1. Child Development & Family Relations 13
   CDFR 101 Family Development, 2 cr.
   CDFR 211 Human Development & Personality I: Childhood, 3 cr.
   CDFR 271 Experience in Human Relations, 3 cr.
   CDFR 312 Human Development & Personality II;

Adolescence, 2 cr.
CDFR 342 Dynamics of Family Development, or
CDFR 443 Problems, 2 cr.

2. Home Economics Education 21
HEd 101 Career Exploration, 1 cr.
HEd 411 Philosophy & Methods, 3 cr.
HEd 331 Practicum in Occupational Teacher Education, 3 cr.
HEd 412 Prep for Student Teaching, and Extension Practicum, 5 cr.
HEd 461 Special Topics, 1 cr.
HEd 473 Supervised Student Teaching in Home Economics, 8 cr.

3. Home Economics 14
HE 101 Field Experiences, 1 cr.
HE 102 Managing Family Resources, 2 cr.
HE 241 Management in Family & Personal Living, 3 cr.
HE 361 Home Equipment; 2 cr.
HE 391 Consumer & the Market, 3 cr.
HE 442 Family Resource Management Lab, 3 cr.

4. Nutrition and Food Science 12
NFS 101 Nutrition & the Family, 2 cr.
NFS 141 Foods: Principles, 4 cr.
NFS 221 Survey of Nutrition or NFS 321 Human Nutrition, 3 cr.
NFS Elective, 3 cr., must be 200 level or higher.

5. Textiles, Clothing & Interior Design 16
TC 101 Clothing & the Family, 1 cr.
ID 102 Housing & the Family, 1 cr.
TC 112 Clothing Construction Principles, 2 cr.
TC 342 Textiles, 3 cr.
ID 331 Family Housing, 3 cr.
TC 412 Socio-Psyc Clothing Aspects, 3 cr.
3 cr. of Interior Design must be 200 level or higher.

B. Communications 9
Engl 101, or 191, Fr Comp, 3 cr.
Engl 300, Junior Comp, 3 cr.
SpCm 101, Fund of Speech, 3 cr.

C. Humanities 6
3 credits of art required
Select from list of approved humanities courses.

D. Natural Science 8-9
Chem 110, 111, or 112, 4-5 cr.
Micro 231, Gen Microbiology, 4 cr.

E. Social Science 9
Approved Econ elective, 3 cr.
Psyc 101, Gen Psychology, 3 cr.
Soc 100, Intro to Sociology, 3 cr.

F. Mathematics Elective 3

G. Courses required for secondary Education certification 10
EPsyc 302, Educational Psychology, 2 cr.
VTTE 405 Prin of Voc. Ed. & Practical Arts, 2 cr.
SeEd 450 Teaching of Reading, 3 cr.
Approved course in Indian Studies.

H. Electives 2-4

I. Other Required Courses 4
PE 100 Fitness & Lifetime Activities, 2 cr. CSc elective, 2 cr.

Total Credits for Graduation 128

Undergraduate Courses

101 Career Exploration 1(1,0) FS
Discussion and analysis of selected careers in Home Economics. Role of education of career development.

331 Practicum in Occupational Teacher Education 1-3 FS
A practicum in work experience (1 credit) and subject matter preparation (2 credits) to develop competencies desirable for teaching occupational programs.

401 Seminar 1-3(1-3,0) S, even yrs.
Current issues of concern in home economics. Investigation of topics for which there is a particular and current need but not offered as part of any class. P, consent.

411 Philosophy & Methods 3(3,0) FS
Philosophy and objectives in home economics related to general and vocational education and to home extension. Methods of instruction, selection and use of resource materials, observation and experience with instructional techniques. Must be taken semester immediately preceding HEd 412. P, 2.0 GPA.

412 Preparation for Student Teaching & Extension Practicum 5(2-4,0) First Half Semester
Planning and developing instruction for various types of home economics programs to meet the needs of selected age groups in structured situations. P, HEd 411, EPsyc 302 and 2.2 GPA.

421 Experiences in Adult Education 2(2,0) S Odd yrs
Background and trends in teaching adults. Observing, organizing and implementing instructional techniques. Open to all majors.

461 Special Topics in Home Economics Education 1-3(0,3) FSSu
For persons needing additional experience or study in a particular aspect of the educator's role. P, consent of instructor.

473 Supervised Student Teaching in Home Economics 8 FS Half Semester
Teaching under supervision in at least two subject areas of home economics. Group and individual conferences. Includes FHA/HERO and home experience programs. Evaluation of student teaching experience. P, 412, a 2.2 GPA and senior standing in home economics.

494 Professional Practicum in Home Economics Education 1-12 FSSu
Working under supervision in an approved experience. Number of credits dependent on experience and supervisory arrangements. P, consent of department and instructor.

Graduate Courses

701 Trends in Home Economics Education 2(2,0)
702 Seminar in Home Economics Education
711 History and Philosophy of Home Economics
741 Supervision in Home Economics Education 2(2,0)
751 Curriculum in Home Economics Education 2(2,0)
761 Evaluation in Home Economics Education 2(2,0)
791 Research Methods in Home Economics Education 3

Home Economics Extension

Students wishing to work with the Cooperative Extension Service as extension home economists or area specialists will find this major provides the professional preparation needed.

A. Home Economics 74

1. Child Development & Family Relations 14
Including: CDFR 101, Family Development, 2 cr.
CDFR 211, Human Development & Personality I, 3 cr.
CDFR 313 Human Development & Personality III; The Middle & Later years, 3 cr.
CDFR Electives 200 level or higher, 7 cr.

2. Home Economics 22
HE 101, Field Experiences, 1 cr.
HE 102 Managing Family Resources, 2 cr.
HE 241 Management in Personal & Family Living, 3 cr.
HE 361, Home Equipment, 2 cr.
HE 391 Consumers & the Market, 3 cr.
HE 442 Family Resource Management Lab., 3 cr.
HE 472 Practicum in Extension, 8 cr.

3. Home Economics Education 9
HEd 101, Career Exploration, 1 cr.
HEd 411, Philosophy & Methods, 3 cr.
HEd 412, Preparation for Student Teaching and Extension Practicum, 5 cr.

4. Nutrition & Food Science 12
Including: NFS 101, Nutrition & the Family, 2 cr.
NFS 221, Survey of Nutrition, 3 cr. or
NFS 321, Human Nutrition, 3 cr.

NFS 141, Foods Principles, 4 cr.
NFS Electives, must be 200 level or above, 3 cr.

5. Textiles, Clothing & Interior Design 17
Including ID 102, Housing the Family, 1 cr.
TC 101, Clothing the Family, 1 cr.
TC 112, Clothing Construction Principles, 2 cr.
TC 242, Textiles, 3 cr.
ID 221, Intro. to Design, 3 cr.
ID 331 or 310, 3 cr.
TC or ID Electives, must be 300 level or above, 4 cr.

B. Communications 9
Engl 101 or 191, Fr Comp, 3 cr.
Engl 300, Junior Comp, 3 cr.
SpCm 101, Fund of Speech, 3 cr.

C. Humanities 6
3 credits of art required.
Select from list of humanities.

D. Natural Science 10-11
Ent 191, Household Pest Control, 2 cr.
Chem 110, 111, or 112, 4-5 cr.
Micro 231, Gen Microbiology, 4 cr.

E. Social Science 12
Approved Econ elective, 3 cr.
Psyc 101, Gen Psychology, 3 cr.
Soc 100, Intro to Sociology, 3 cr.
PolS 320 Public Admin, 3 cr.

F. Mathematics Elective 3

G. Other Required Courses 10
PE 100 Fitness & Lifetime Activities, 2 cr.
EPsyc 302 Educational Psyc, 2 cr.
MCom 330 Writing for Radio & TV, 2 cr.
MCom 313 Publicity Methods, 2 cr.
CSc course, 2 cr.

H. Electives 6
Suggested Electives:
ArtS 122 Design Fundamentals, 3 cr.
MCom 261 Press Photography, 2 cr.
SpCm 315 Public Speaking, 3 cr.

Total Credits to graduate 128

Home Economics Journalism

Curriculum in Home Economics, Home Economics Journalism Major

This major is intended to prepare home economics students for journalism positions with businesses, government agencies, newspapers, magazines, radio and television, universities and other organizations which require persons with a combined knowledge of journalism and home economics. The courses provide training in newspaper and magazine reporting and editing, broadcast journalism, advertising and mass communication law.

In order to graduate, you must complete at least 16 credit hours in one of the following areas of Home Economics: 1) Child Development, 2) Nutrition and Food Science, 3) Textiles and Clothing, 4) Interior Design, 5) Home Management & Consumer Studies.

A. Home Economics 53-54

1. Child Development & Family Relations 8
CDFR 101, Family Development, 2 cr.
CDFR Electives, must be 200 level or above, 6 cr.
2. Home Economics 11
HE 101 Field Experiences, 1 cr.
HE 102 Managing Family Resources, 2 cr.
HE 241 Management in Personal & Family Living, 3 cr.
HE 361 Home Equipment, 2 cr.
HE 391 Consumers & the Market, 3 cr.
3. Home Economics Education 3-4
HEd 101 Career Exploration, 1 cr.
HEd 411, Philosophy & Methods, 3 cr. or
HEd 421, Experiences in Adult Education, 2 cr.
4. Nutrition and Food Science 8
NFS 101, Nutrition & the Family, 2 cr.
NFS 141, Foods: Principles, 4 cr.
NFS Elective, must be 200 level or above, 2 cr.
5. Textiles, Clothing & Interior Design 8
TC 101, Clothing & the Family, 1 cr.
ID 102, Housing & the Family, 1 cr.
TC Elective, must be 200 level or above, 3 cr.
ID Elective, must be 200 level or above, 3 cr.
6. Home Economics electives 15

B. Communications 9
Engl 101 or 191, Fr Comp, 3 cr.
SpCm 101, Fund of Speech, 3 cr.
Engl 300, Junior Comp, 3 cr.

C. Humanities 6
Select from list of humanities.

D. Natural Science 9
One physical and one biological science

E. Social Science 9
Psyc 101, Gen Psychology, 3 cr.
Soc 100, Intro to Sociology, 3 cr.
Elective, 3 cr.

F. Journalism* 30-34
MCom 210, Newswriting, 3 cr.
MCom 213, Journalism Typography, 2 cr.
MCom 261, Press Photography, 2 cr.
MCom 310, Newspaper Editing, 2 cr.
MCom 311, Newspaper Editing Lab, 1 cr.
MCom 315, Magazine Writing & Production, 3 cr.
MCom 333, Broadcast Journalism, 2 cr.
MCom 370 Principles of Advertising, 3 cr.
MCom 371 Advertising for Print Media, 3 cr.
MCom 413, Journalism Internship, 2-4 cr.
MCom 414, Mass Communication Law, 3 cr.
Journalism electives, 2-8 cr.

G. Mathematics Elective 3

H. Other 2
PE 100 Fitness & Lifetime Activities, 2 cr.

I. Electives 4-7
Suggested Electives:
NFS 221 Survey of Nutrition, 3 cr.
Chem 110 General Chemistry, 4 cr.
Micro 231 Microbiology, 4 cr.
B-Ad 350 Business Law I, 3 cr.
B-Ad 360 Organization Theory & Mgt. Concepts, 3 cr.
PolS 320 Public Administration, 3 cr.
Ent 191 Household Pest Control, 2 cr.
SpCm 315 Public Speaking, 3 cr.
MCom 330 Writing for Radio and TV, 2 cr.

*Two to four credits in MCom 413 are required. They may be taken either semester or in summer session as "Intern" work on a newspaper, magazine, or broadcasting station with approval of department head. Not more than 38 nor less than 30 credits may be taken in journalism.

Honors Program (HON)

John Haertel, Agriculture; Gordon Tolle, Arts and Science; Edna Anderson, Home Economics; Robert Lacher, Engineering; Beth Hanson, Nursing; Allan Lindstrom, Education; Gary Omodt, Pharmacy

Purpose

1. To tap the multiverse of temperament, interest, and ability, i.e., to develop the unique, sacred individual gift;
2. To enable the student to achieve a self chosen, self-defined distinction rather than forcing society's or the university's definition of distinction on him or her;

3. To stimulate creative scholarly or professional production in those students who have the knowledge, skills, energy, and imagination for such production.

Courses in the honors program are in two categories:

1. **The Colloquia**

   All honors program students will be required to take at least 12 hours of Honors Colloquia, and encouraged to take all of them. The colloquia are academic-year long seminars with reading lists, lectures, discussions, examinations, and papers (from independent study of topic, problem, etc. related to, or growing out of the colloquia). Any of the four Honors Program Colloquia (Honors 100, History of Ideas; Honors 200, The Arts; Honors 300, The Social Sciences; Honors 400, History and/or Philosophy of Science) will acquaint students with the quality and requirements of the Honors Program and performance in a colloquium will provide **one** standard for selection of students for continuation in the Honors Program. The colloquia carry three hours credit per semester, and each may be repeated once as the topic and reading lists change. The colloquia may be used to satisfy core requirement electives for the baccalaureate degree and may be taken in any sequence by any student for credit. Class size is limited to fifteen.

2. **Independent Study in the Major**

   In the junior year Honors Program students should begin independent study in the major, not as a substitute for required courses, but in the electives in the major. Six to nine hours of independent study in the major will be required. The student will work out in conference with the major department a program of reading or inquiry related to his or her particular intellectual curiosity and professional goals. An undergraduate thesis, oral or written examinations, applications, demonstrations, performance, publication, etc. will provide objective data for evaluation.

By registering in the Honors Program and independent study within a major, a student declares ability to do productive work at a scholarly or professional level. The results of independent study will be evaluated as honestly and objectively as the work of any other professional within the discipline.

Recognition

On the diploma of an Honors Program graduate there will be a statement or seal indicating completion of an Honors Program. This is not related to, and in no way replaces or competes with the traditional graduation honors distinction, but is merely an acknowledgment of the student's kind of education, i.e., independent study evaluated by professional standards. Such recognition should be understood as an indication of proven energy, imagination, and productivity.

Admission

Any student may register in any colloquium with the approval of the adviser. Acceptance into the Honors Program, however, requires the approval of the Honors Program Committee which will select candidates on the basis of creative potential, demonstrated energy and imagination, academic performance, and departmental recommendation.

Honors Courses

100 Honors Colloquium 3(3,0) FS
History of ideas. May be repeated once.

200 Honors Colloquium 3(3,0) FS
The Arts. May be repeated once.

300 Honors Colloquium 3(3,0) FS
The Social Sciences. May be repeated once.

400 Honors Colloquium 3(3,0) FS
History and/or Philosophy of Science. May be repeated once.

Horticulture-Forestry (Ho, F, PR, La)

College of Agriculture and Biological Sciences

Professor Peterson, head; Professor Collins, Prashar; Associate Professors Helwig, Johnson, Martin, Nordstrom; Assistant Professors Baer, Spinski; Assistants Alber, Evers, Waples, Enevoldsen.

The department offers instruction leading to the Bachelor of Science degree with majors in Horticulture, Landscape Design, and Park Management. The department also offers a two-year curriculum in Pre-Forestry after which you transfer to another school to complete your forestry training. Courses are offered in Horticulture (Ho), Landscape Design (La), Park Management (PR), and Pre-Forestry (F).

Horticulture (Ho)

The program for students majoring in horticulture is designed for those who plan to work in nurseries; flower, vegetable or fruit production; processing; plant inspection; sales; plant breeding; garden center operations and various other related fields. The specialized teaching option prepares you for teaching vocational horticulture at the secondary, post secondary and adult levels. Curriculum variations are in business and science options. Extensive research plots in woody ornamentals, vegetables, fruit and herbaceous ornamentals and greenhouse facilities provide valuable teaching aids.

Curriculum in Agriculture, Horticulture Major

Leading to the Bachelor of Science Degree

Freshman Year* **	**F**		**S**
Fr Comp, Engl 101 or 191	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)		4
Intro Biology, Bio 151	3		
Botany: Structure and Function, Bot 200			3
Gen Horticulture, Ho 111	3		
Gen Psychology, Psyc 101	3		
Algebra, Math 111	3		
Soils, PS 113	3	or	3
Work Experience, Ho 494*** (2 Su)			

Sophomore Year* **	**F**	**S**
Plant Pathology, PS 223	3	
Prin of Econ I, Econ 201	3	
Floral Design, Ho 213	2	
Horticultural Insects, Ent 295	3	
Introductory Physics, Phys 101		4
Vegetable Growing, Ho 212	3	
Elementary Organic Chem, Chem 120		4
Turf Management, Ho 211		3
Intro to Sociology, Soc 100		3
Work Experience, Ho 494*** (2 Su)		
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
Advanced Exposition, Engl 303		2

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	
Plant Pathology II, PS 333 (Hort Section)		3
Intro to Computers & Programming, CSc 311		3
Humanities electives	3	3
Work Experience, Ho 494***		
Special electives**	3	3
Electives*	5	3

***Horticulture Major Suggested Elective Courses:**

Ho 414, Plant Breeding; F231, Dendrology; La 324, Planning Public Grounds; PR 201, Park Administration & Organization; Bot 201, Plant Kingdom; Bot 261, Plant Taxonomy; Bot 415, Plant Ecology; Bot 421, Plant Anatomy; PS 233, Weed Control; PS 323, Soil Fertility & Fertilizers; MA 213, Farm Power & Machinery; MA 333, Soil & Water Mechanics; MA 433, Small Power Equipment; Stat 341, Statistical Methods I; Econ 202, Principles of Economics II; B-Ad 360, Organization Theory & Management Concepts; F 331, Farm Forestry.

**6 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.

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
Fruit, vegetable and flower growing; planting and care of home grounds.

211 Turf Management 3(2,2) S
Maintenance and culture of turfgrass for lawns, parks, golf courses, athletic fields and special purpose turf. P, PS 113.

212 Vegetable Growing 3(3,0) F
Methods used by home gardeners and commercial growers in vegetable production. P, Ho 111 or PS 103.

213 Floral Design 2(0,4) F
Cut flower arrangement; flowers and plants in home; exhibiting and judging flowers and plants.

311 Herbaceous Plants 3(2,2) F
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
Fundamental anatomical and physiological principles and methods of reproducing herbaceous and woody plants by seeds, cuttings, grafts, layers and division. P, Hort 111 or consent.

313 Woody Plants 4(2,4) F
Nomenclature, identification and classification of hardy coniferous and deciduous trees and shrubs, vines, and groundcovers. Landscape use as affected by inherent ornamental qualities, hardiness, environmental factors, and pests.

315 Flower Judging 1(0,3) S
Experience in judging cut flowers, flowering potted plants, and foliage plants using standards of Society of American Florists and Pi Alpha Xi. May be repeated for a maximum of 3 credits. P, Ho 111 Desirable.

411 Fruit Production 3(2,2) F
Fruit production in relation to soils, moisture, temperature, cultivars, rootstocks, pruning, growth regulators. P, Bio 153, Ho 111 A.Y.

412 Greenhouse Management 3(2,2) S (1983)
Greenhouse construction, environmental control, production and scheduling of major greenhouse crops. Field 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, Bio 153, or Ho 313.

414 Plant Breeding 3(3,0) F (1983)
Sea Plant Science 443 for course description.

470 Seminar 1(1,0) F
Required of all major students; limited to two credits.

471 Problems 1-2 FS
Special investigation in horticulture area. Maximum four hours credit. P, consent, research problem 2.7 G.P.A.

494 Professional Internship/Cooperative Education/Field Experience in Horticulture 1-12 FSSu
a) Work experience for horticulture students. Two credits per semester or equivalent time unit.
b) A supervised on-the-job practical experience program 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.

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, or 191	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	
Engineering Surveys, CE 208		3
Gen Psychology, Psyc 101	3	
Drawing I, ArtS 113		3
Architectural Design Drafting, EG 223		3
Prin of Economics I, Econ 201	3	
Technical Sketching, EG 231		1
Prin of Ecology, Bio 211	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
Ceramics I, ArtS 253	3	
Landscape Design I, La 321	3	
Site Planning, La 322	3	
Earthforms, Geo 439	2	
Business Law I, B-Ad 350		3
Problems, La 471		1
Turf Management, Ho 211	3	
Landscape Construction, La 323		3
Herbaceous Plants, Ho 311	3	
History of Arch. & Landscape Arch., La 320		3

Senior Year	**F**	**S**
Seminar, Ho 470	1	
Planning Public Grounds, La 324	3	
Urban Sociology, Soc 340	3	
Intro to Lit, Engl 218	3	
Art Survey, Art 223	3	
State & Local Gov't, PolS 210	3	
Landscape Design II, La 420		3
City Planning, La 421		3
Remote Sensing in Geography, Geog 484		3
Problem, La 471***		2
Group I electives in Ag		3
Elective*		3

**Problems, La 471, (1-4) Students shall select appropriate topics from the following list which correspond to their intended area of specialization or reenforce 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.

***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 123; Graphic Design I, ArtD 231; 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 (1983)
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 (1983)
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 (1984)
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 (1982)
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 (1983)
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 (1984)
Advanced Landscape Design involving contemporary theories, complex problems. P, La 324.

471 Problems 1-2 FS
Special investigations in landscape design. Maximum of 4 hours credit. P, consent.

472 Professional Internship/Cooperative Education/Field Experience in Landscape Design 1-12 FSSu
See course description under Horticulture curriculum.

Park Management (PR)

Program designed to develop professionals who intend to enter the field of parks and recreation. A 2.2 GPA or better is required for graduation in park management. Students must have 2.0 GPA or better to transfer into the park management curriculum.

Curriculum in Agriculture, Park Management Major

Leading to the Bachelor of Science degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Gen Forestry, F 131 or Gen Hort, Ho 111	2-3		
Gen Chem, Chem 110			4
Intro Biology, Bio 151			3
Algebra, Math 111	3		
Fund of Speech, SpCm 101	3	or	3
Intro to Sociology, Soc 100			3
Gen Psychology, Psyc 101	3	or	3
Soils, PS 113	3		
Humanities elective	3		
Work Experience, PR 494*			

Sophomore Year	**F**		**S**
Prin of Econ I-II, Econ 201-202	3		3
Hort Insects, Ent 295 or Plant Pathology, PS 223	3		
Intro to Physics, Phys 115			4
Humanities elective	3	or	3
Geology, PS 243			3
Forestry elective, F 231 or F 232	3	or	3
Park Admin & Organization, PR 201	3		
Work Experience, PR 494*			
Electives**	4		

Junior Year	**F**		**S**
Junior Comp, Engl 300	3	or	3
Soil & Water Mechanics, MA 333			3
Woody Plants, Ho 313	4		
Hort elective, Ho 311 or Ho 413	3	or	3
Landscape Design I, La 321	3		
Outdoor Recreation Resource Management & Interpretation, PR 301	3		
Public Speaking, SpCm 315	3	or	3
Economics electives*	3	or	3
Commercial Recreation Areas, PR 302	3		
Work Experience, PR 494*			
Electives**			4

Senior Year	**F**	**S**
Public Administration, PolS 320		3
Advanced Exposition, Engl 303	3	
Planning Public Grounds, La 324	3	
State & Local Gov't, PolS 210	3	

Seminar, Ho 470	1	
Advanced Park Management, PR 401		3
Turf Management, Ho 211		3
City Planning, La 421		3
Community Recreation, Recr 440		2
Economics electives*	3	3
Electives‡	2	

*9 credits to be elected from: Actg 210 Princ of Actg I; Actg 211 Princ of Actg II; B-Ad 350 Business Law I, B-Ad 351 Business Law II; B-Ad 360 Org. Theory and Mgmt Concept, Econ 433 Public Finance, Stat 341 Statistical Methods I.

†Students must elect either of the following: (1) Work 2 summers or equivalent time unit between freshman and senior years in park systems approved by the Horticulture-Forestry Dept. No credits. (2) Work 1 summer or equivalent time unit as stated in (1) above and work 1 summer or more under professional internship PR 494.

‡For students not taking Professional internship.

****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; Soil Geography & Land Use interpretation, PS 310; Municipal Government & Administration, PolS 408; Introduction to Research Methods, Soc 310; Rural Sociology, Soc 240; Discussion, SpCm 334; Environment Conservation, WL 210.

Undergraduate Courses

201 Park Administration & Organization 3(3,0) F (1982)
Fundamentals governing public park and recreation agencies. Basic functional objectives of such agencies. Includes planning, management, administrative organization. P, sophomore standing.

301 Outdoor Recreation Resource Management & Interpretation 3(2,2) S (1983)
Outdoor recreation area planning, acquisition, development, interpretation, management. P, PR 201.

302 Commercial Recreation Areas 3(3,0) F (1983)
Factors represented by commercial recreation areas to include history, relationship to tourism, management, development, technical assistance, P, PR 201.

401 Advanced Park Management 3(2,2) S (1984)
Current philosophies in park management. P, PR 301 or PR 302. PR majors only.

471 Problems 1-2 FS
Investigations in park management. Max. of 4 hours credit. P, consent.

494 Professional Internship/Cooperative Education/Field Experience in Park Management 1-12 FSSu
Select either (a) or (b)
(a) Work experience for park management students. Two credits per semester or equivalent time unit.
(b) 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.

Pre-Forestry (F)

The two-year pre-forestry curriculum is offered for students who expect to enter a school of forestry to complete the Bachelor of Science degree. For students interested in such phases of forestry such as wood technology, forest recreation, or lumber merchandising, **it may be necessary to revise the designated two-year curriculum to meet the requirements of the selected forestry school degree program.**

Curriculum in Agriculture, Pre-Forestry

Freshman Year	F		S
Fr Comp, Engl 101 or 191	3	or	3
Intro to Sociology, Soc 100	3		
Fitness & Lifetime Activities, PE 100	1		1
Intro Biology, Bio 151	3		
Botany: Structure and Function, Bot 200			3
Algebra & Trigonometry, Math 113	5		
General Forestry, F 131	2		
Mathematical Analysis I, Math 123 or Calculus for Non-Math majors, Math 222			5
Gen Chem, Chem 110			4
Fund of Speech, SpCm 101	3	or	3

Sophomore Year	F		S
Junior Comp, Engl 300			3
Intro Physics, Phys 101 or 111			4
Prin of Econ I, Econ 201	3		
Soils, PS 113	3		
Forest Ecology, F 232			3
Intro to Computers & Programming, CSc 311			3
Dendrology, F 231	3		
Geology, PS 243			3
Elementary Organic Chem, Chem 120	4		
Intro to Entomology, Ent 105 or Hort Insects, Ent 295	3	or	3

Undergraduate Courses

131 General Forestry 2(2,0) F
Introduction to forestry. Emphasis on American forestry. Brief description of forestry as a profession.

231 Dendrology 3(2,3) F
Identification, classification and characteristics of commercial forest trees of U.S. Laboratory identification of S.D. trees and shrubs.

232 Forest Ecology 3(3,0) S
Basic factors controlling forest growth and development under natural conditions.

331 Farm Forestry 3(3,0) S
Brief history of U.S. forestry; tree and its environment; farm woodland forestry with emphasis on windbreaks and shelterbelts.

471 Problems 1-2 cr. FS
Special investigations in forestry. Maximum of 4 hours credits. P, consent.

494 Professional Internship/Cooperative Education/Field Experience in Forestry 1-12 FSSu
See course description under Horticulture curriculum.

Humanities (Hum)

College of Arts and Science

Professor Alexander, Department of English, coordinator.

Humanities courses enable you 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 3(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.

215 Ethnic Literature 3(3,0)
(Alternate semesters) 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.

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. Directed by one professor, supported by staff from broad range of departments. P, Sophomore

standing or consent. May be repeated with consent of the coordinator of the LAAS program. Enrollment limited to 20.

401 Directed Studies in Latin American Cultures 1-3
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 two 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.

Indian Area Studies Program

Dr. Jack Marken, Coordinator

An intercollege program of Native American culture studies. Purposes are 1) draw together courses already taught on this campus into an Indian Studies Program; 2) encourage the enrollment of Native American students by providing a coordinated program in their culture at this university; 3) provide an opportunity for all university students to learn about the achievements of the American Indian.

Courses already approved for acceptance in the minor are:

Course Number	Course Title	Credit Hrs
Anth 220	Cultural Anthropology	3
Anth 421	Indians of North America	3
Engl 256	Literature of the American West	2
Engl 351	American Indian Literature of the Past	2
Engl 352	American Literature of the Present	3
Engl 592/ 692	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	Race & Nationality Prob	2
SpCm 360	Indian Oratory & Drama	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.

Industrial Arts (IA)

(See Education)

Journalism And Mass Communication (J)

College of Arts and Science

Professor Lee, Head; Professor Emeriti Harding, Markland, Phillips, Straw; Associate Professors Andresen, Cline, McCorkle, Van Ommeren; Associate Professors Emeriti Abel, Evenson, Laird, Wentzy; Assistant Professors Alber, Eich, Harmsen, Petrella; Instructor Lundgren.

The department offers courses in journalism and printing. A four-year program leading to the bachelor of arts or bachelor of science degree is available in journalism with sequences in news-editorial, advertising and broadcast journalism. Additional four-year programs leading to the bachelor of science degree are available in science and technical writing, agricultural journalism, home economics journalism, printing-journalism, printing management and printing education. For the two-year program in printing, see Associate Degree Programs.

The major in journalism (with sequences in news-editorial, broadcast and advertising) prepares you for positions requiring a broad liberal education plus sound knowledge of journalistic skills. Positions include work on daily and weekly newspapers, magazines, radio and television stations, advertising and public relations agencies and information services.

You normally begin the major in the freshman or sophomore year, but may begin in the junior year. You must have a grade of C or better in freshman English to be admitted. 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 news-editorial sequence has been approved by the American Council on Education for Journalism and Mass Communication, the only organization granted authority to accredit journalism schools. The program at SDSU has been accredited continuously since journalism accreditation started.

Science and Technical Writing. For those who wish to become technical writers, either for commercial companies, magazines or newspapers.

Agricultural Journalism. Students in the College of Agriculture may major in journalism. The curriculum is designed for students with an agricultural background who wish training in journalism. This curriculum prepares graduates to work with agricultural magazines and newspapers, agricultural news at newspapers, and radio-TV stations, college extension services, experiment stations and firms employing writers and journalists trained in agriculture. Many graduates go into public relations work.

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 a combined knowledge of journalism and home economics.

Printing and Journalism. A program combining printing with journalism provides a separate major for graduates entering the publishing field, where a knowledge of printing coupled with journalistic skills is a principal qualification. Graduates are especially well qualified to work in public relations, advertising and other phases of publishing. Consists of 35 credits in printing and 18 credits in journalism. Not more than 40 credits in printing or 24 in journalism may be counted toward the BS degree.

Minor in Journalism. Available for students majoring in other fields. Courses required are newswriting and reporting, newspaper editing, editing laboratory and other journalism courses to total 16 credits.

Graduate Work in Journalism. A M.S. degree is offered. (See the Graduate School catalog for details.)

Broadcast Facilities. KESD-TV and KESD-FM provide laboratory facilities and part-time work for broadcast journalism students.

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 261, Press Photography; MCom 414, Mass Communication Law; MCom 417, History of Journalism, or MCom 572, Mass Media in Society; and MCom 494, Journalism Internship.

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: Public Affairs Reporting, MCom 316, or Film Production, MCom 361. Optional: 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, Radio and TV Advertising and MCom 473, Advertising Campaigns.

Specialized Majors, Offered in science and technical writing, agricultural journalism and home economics. See requirements under these curricula.

Curriculum in Arts and Science, Journalism Major, News-Editorial Sequence

Leading to the Bachelor of Arts degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	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

Sophomore Year	**F**		**S**
Newswriting and Reporting, MCom 210	3	or	3
Second-year foreign language	3		3
State & Local Gov't, PolS 210	3	or	3
Journalism Typography, MCom 213	2	or	2
Press Photography, MCom 261	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, or Hist. of Journalism, MCom 417			3
Journalism Internship, MCom 494 (Internship recommended during summer before senior year)	2-4	or	2-4

Additional Required Credits	**Cr.**
Social Science	24
(To be elected from approved courses in at least three fields)	
Humanities	12
(To be elected from approved courses)	
Natural Science	8
(From approved list in at least two areas with different course prefixes) One course with lab is required.	
Mathematics	3

Not less than 30 or more than 36 credits in journalism courses may be counted. You must complete at least 40 semester credits in courses numbered 300 or above to qualify for the bachelor of arts degree.

Curriculum in Arts and Science, Journalism Major, News-Editorial Sequence

Leading to the Bachelor of Science degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	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

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
Press Photography, MCom 261	2	or	2

Junior and Senior Years
Same as for bachelor of arts degree curriculum.

Additional Required Credits	**Cr.**
Social Science	24
(To be elected from approved courses in at least three fields)	
Humanities	8
(To be elected from approved courses)	

Not less than 30 or more than 36 credits in journalism courses may be counted. You must complete at least 40 semester credits in courses numbered 300 or above to qualify for the bachelor of science degree.

Journalism Major, Broadcast Sequence

Follow bachelor of arts degree or bachelor of science degree requirements for news-editorial sequence (above) but with the following changes:

(Some MCom courses are listed under Speech)

Freshman Year
Same as news-editorial sequence

Sophomore Year
Same as news-editorial sequence but delete Journalism Typography, MCom 213.

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		
Optional: Public Affairs Reporting, MCom 316, or Film Production, MCom 361			
Optional: Radio News Laboratory, MCom 336			

Senior Year	**F**		**S**
Radio & TV Production, MCom MCom 331	3		
Mass Communication Law, MCom 414	3		
Either Mass Media in Society, MCom 572, or History of Journalism, MCom 417	3	or	3
Journalism Internship, MCom 494	2-4	or	2-4
Optional: Radio News Laboratory, MCom 336			

Not less than 30 or more than 36 credits in journalism may be counted. You must complete at least 40 semester credits in courses numbered 300 or above to qualify for the bachelor of science or bachelor of arts degree.

Journalism Major, Advertising Sequence

Follow bachelor of arts degree or bachelor of science degree requirements for news-editorial sequence (above) but with the following changes:

Freshman Year
Same as news-editorial sequence

Sophomore Year

Same as News-Editorial but delete PolS 210.
Add:

Macroeconomics Principles, Econ 201	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 for Print Media, MCom 371			3
Radio TV Advertising, 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, or History of Journalism, MCom 417	3	or	3
Journalism Internship, MCom 494	2-4	or	2-4

Not less than 30 or more than 36 credits in journalism may be counted. You must complete at least 40 semester credits in courses number 300 or above to qualify for the bachelor of science or bachelor of arts degree.

Curriculum in Agriculture, Agricultural Journalism Major

Leading to the Bachelor of Science degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	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 115 or Elementary Physics I, Phys 111 or General Physics I, Phys 211			4-5
Crop Production, PS 103	3		
Intro to Animal Science, AS 101			3

Sophomore Year	**F**		**S**
Econ 201-202	3	or	3
Soils, PS 113			3
Fund of Speech, SpCm 101	3	or	3
Elements of Dairying, DS 130			3
Newswriting & Reporting, MCom 210	3	or	3
Journalism Typography, MCom 213	2	or	2
Press Photography, MCom 261	2	or	2
General Horticulture, Ho 111			3
Social Science elective	3	or	3

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	or	3
Farm Power & Machinery, MA 213			3
Advertising in Print Media, MCom 371 or Radio-TV Advertising, MCom 372			3
Poultry Management, AS 461	3		
Entomology Elective	3	or	3
Radio News Reporting, MCom 333	3	or	3
Humanities elective	3		5

Senior Year	**F**		**S**
Mass Communication Law, MCom 414	3	or	3
Interpretive Reporting, MCom 410			3
Journ Internship, MCom 494	2-4	or	2-4
Electives in Agriculture†			

At least 30 but no more than 38 credits in journalism are allowed. 40 upper division credits required.

†Suggested: AS 223 Animal Nutrition; Ent 391 Insecticides; PS 233 Weed Control; Econ 353 Marketing; Econ 271 Farm and Ranch Management; or PS 223 Principles of Plant Pathology I.

Curriculum in Arts and Science, Science and Technical Writing Major

Leading to the Bachelor of Science degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	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
Press Photography, MCom 261	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	2	or	2
Magazine Writing & Editing, MCom 315	3	or	3

Senior Year	**F**		**S**
Interpretive Reporting, MCom 410			3
Mass Com Law, MCom 414	3	or	3
Journ Internship, MCom 494	2-4	or	2-4

Additional Required Credits	**Cr.**
Social Science	18
(To be elected from approved courses in at least three fields.)	
Humanities	8
(To be elected from approved list.)	

Not less than 30 but not more than 36 credits can be earned in journalism.

Courses are listed under the following headings: Mass Communication (MCom); General Communication (GCom); and Printing (Prtg).

Mass Communication (MCom)

Undergraduate Courses

130 Intro to Radio & TV 3(3,0) F
History, structure, regulation, and financial support; potential and limitations; public responsibilities, impact on society.

151 Intro to Mass Com 2(2,0) F
Nature and scope of newspapers, magazines, broadcasting, wire services, syndicates.

160 Basic Photography 2(1,3) FS
Use of camera and darkroom equipment. Not for journalism majors.

210 Newswriting & Reporting 3(2,3) FS
Gathering, evaluating and writing news. P, freshman English grade no lower than C. Not open to freshmen without consent.

213 Journalism Typography 2(1,3) FS
Printing; type faces and processes; page pasteup, proofreading.

261 Photojournalism 2(1,3) FS
Camera and darkroom techniques, photo-journalism. P, advance registration with instructor.

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. For county agents, home economics leaders or prospective teachers. Not open to journalism students who take 210.

315 Magazine Writing & Editing 3(3,0) FS
Writing and preparing articles for publication. P, freshman English with grade no lower than C, and consent.

316 Public Affairs Reporting 3(2,3) FS
Covering and writing news of government, politics, economics, education and sociological problems at the local and county level. P, 210, PolS 210 or consent.

317 Publication Supervision & Production 2(2,0) S
Techniques for producing printed publications. P, MCom 315.

330 Writing for Radio & TV 2(1,3) S
Preparation of commercials, public service announcements, talks, interviews, drama, documentaries, and educational programs.

331 Television Production 3(2,3) F
Includes preparation and presentation of talks, interviews, discussion and extension and community services for broadcast.

332 Television News Reporting 3(2,3) F
TV news writing, gathering, and producing. Lab practice with film and videotape. P, 333 or consent.

333 Radio News Reporting 3(1,3) FS
Radio news writing, editing and producing. Lab practice with audio tape. Some stories gathered and reported for KESD-FM. P, 210 for majors; 330 for others.

335 Broadcast Programming 3(3,0) S
Program types and essentials of effective structure. Audience characteristics and preferences. Managerial problems. Agricultural, commercial, and educational broadcast requirements.

336 Radio News Laboratory 1-3 FS
Gathering, writing, editing and producing daily stories for KESD-FM. P, 333 for majors; 330 for others.

365 Advanced Photography 2(1,3) S
News photos for media. P, 261 or equivalent.

370 Prin of Advertising 3(3,0) F
History, ethics, economics, psychology and impact of modern advertising.

371 Advertising Copy and Layout 3(3,0) S
Writing, designing and planning advertising; P, 370.

372 Broadcast Advertising 3(2,3) S
Creating and producing broadcast advertisements, promotions and public service announcements. P, 370 or consent.

392 Directed Studies
Refer to Arts and Science alternatives and options statement.

394 Undergraduate Course Specials
Refer to Arts and Science alternatives and options statement.

410 Advanced Reporting 3(2,3) S
Political, scientific, technical in-depth reporting. P, 210.

412 Advanced Editing Lab 1(0,3) FS
Advanced editing and production.

414 Mass Communication Law 3(3,0) FS
Libel, privacy, news gathering rights and press freedom in America.

450 Special Problems in Journalism 1-3 FSSu
P, senior standing.

473 Advertising Campaigns 3(3,0)
Develop advertising campaign from start to finish. P, 370, 371, 372.

490 Senior Research Problems 2(2,0) FS
Problems and methods in mass communication research. For advanced undergraduates. P, senior standing.

494 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu
Supervised media experience; print, broadcast, public relations. P. consent of department program coordinator.

Graduate Courses

510-610 Seminar in Mass Communications 2(2,0) FS
Work in selected areas including special investigation, reports and discussion.

515-615 Editorial Writing & Policy 2(2,0)
Opinion function of periodicals; great editorials and editorial writers; writing editorials; shaping policy.

516-616 History of Journalism 3(3,0) S
Development, impact and importance of individual journalists and media in U.S.

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.

651 Special Problems in Communications 1-3 FSSu
P, consent.

573-673 Public Relations 3(3,0) SSu
Interpreting institutional and industrial policies and programs to the public.

790 Thesis in Journalism 1-6 FSSu

791 Research Methods in Communications 3(3,0)

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) FSu
Formation and measurement of public opinion; role of the media; propaganda techniques, agencies, theories. P, senior standing, consent.

Printing Management (Prtg)

Professor Lee; Professors Emeriti Harding, Phillips, Straw; Associate Professors Emeriti Abel, Evenson; Assistant Professors Harmsen, Petrella; Instructor Lundgren.

Printing Management. For prospective printing and graphic arts industry executives or managers. A four-year program that stresses managerial and technical course work and leads to the bachelor of science degree. You will also receive a solid foundation in the liberal arts. Courses in engineering and computer science are strongly suggested electives.

Technical course work is concentrated in the first two years and is prerequisite to some courses listed for the junior and senior years. Upon successful completion of the first two years the student is eligible for the associate degree.

At least 40 but not more than 50 credits in Printing Management may be counted toward the degree. (See minimum degree requirements for the College of Arts and Science.)

Printing and Journalism. A combined program provides a separate major for prospective students in the newspaper and publishing fields.

Printing-Education. Prospective printing instructors in vocational schools or high schools will find the curriculum designed for their needs. If you are going into education, you must decide before the junior year, and consult the chairperson of the department and Division of Education. Since most states require printing teachers have industrial experience before certification, you should know the state regulations and obtain practical experience. The department can assist you in obtaining experience.

Two-Year Printing Course. A technical program is offered prospective printing and graphic arts personnel who do not wish to pursue the four-year bachelor of science degree. It provides you with a general education coupled with practical shop courses and experience. The program allows transfer to the four-year printing program with no credit loss. Also, the curriculum requirements include at least 9 of the 12 credits required for a minor in communications, which appears in the section titled "Associate Degree and Certificate Programs."

Non-credit Vocational Courses. For those who wish to become printing craftsmen, admission standards need not be met, but you must have department approval and be 16 years old.

Limited Enrollment. The number of students is limited by the space and equipment available. At present the limit for entering freshmen is 20. Advanced application to the Director of Admissions is required.

Waiving Courses for Experienced Students. Students with demonstrated proficiency may be excused from appropriate courses and substitute other courses with department approval.

Standards of Proficiency. Students who are not capable of meeting standards may be dropped from courses or required to attend additional classes.

Curriculum in Arts and Science, Printing Management Major

Leading to the Bachelor of Science degree

Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	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 Printing, Prtg 112	3		
Composing Machines, Prtg 113			3
Algebra, Math 111 or 113	3	or	3
Beginning Typewriting, OEd 111 (for students with no previous instruction in typing)	1		

Sophomore Year	**F**		**S**
Typography, Prtg 211	3		
Photography, MCom 160	2	or	2
Bindery, Finishing and Distribution Prtg 212	3		
Pricing, Prtg 214			3
Newswriting & Reporting, MCom 210 or Publicity Methods, MCom 313	3	or	3
Lithography, Prtg 213			4
Physical Science	4		4

Junior Year	**F**		**S**
Junior Comp, Engl 300	3	or	3
Prin of Econ, Econ 201-202	3		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	
Advanced Lithography, Prtg 415		3

Additional Required Credits for degree	**Cr.**
Printing Management (Elected from courses numbered 300 or above)	2
Social Science (Elected from approved list)	9
Humanities (Elected from approved list)	8

*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.

Although not required for the bachelor of science degree the following courses from the engineering sequence should be strongly considered for further study.

Mathematics
113 College Algebra and Trigonometry
123, 224, 225, Mathematical Analysis
222, Calculus for non-Math Majors

Chemistry
110 General Chemistry
120 Elementary Organic Chemistry

Engineering
305-306 Basic Electrical Engineering

Statistics
341 Statistical Methods
641 Statistical Methods II

Physics
211 General Physics I
213 General Physics II

Computer Science
311 Introduction to Computers and Programming
312 Computer Programming
313 Data processing
316 Computer Languages
361 Computer Information Systems
See course descriptions listed elsewhere in the catalog

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 (Elected from courses numbered 300 or above)	9
Social Science (Elected from approved courses in at least two of the	12

following fields; economics, history, political science and sociology)
Humanities 8
(Elected from approved list)
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 417			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
Advertising for Print Media, MCom 371			3

Senior Year	**F**		**S**
Mass Com Law, MCom 414	3		
Sr. Research Problems, MCom 490	2	or	2
Printing Internship, Prtg 494	2-4	or	2-4
*Sales, Promotion, and Marketing Prtg 314			3

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 8
(Elected from approved list)

*Offered Alternate Years.

Not more than 42 credits in printing and 24 credits in journalism will be counted. You must complete a minimum of 40 semester credits in courses numbered 300 or above to qualify for the bachelor of science degree.

Summer Vocational Courses in Printing — Non-Credit Vocational Courses

The vocational printing course descriptions appear below and require advanced application and consent. You may enroll for two courses, or for the same course twice, which will constitute a full load, equivalent to 8 credits for fee purposes. You may not enroll in any other courses. A limited number are accepted; the courses offered are only in summer sessions if their demand is sufficient. Enrollment may be for either half load or full load. A full load is from 30 to 40 clock hours a week. Tuition is the same as regular credit courses, based on a full load equaling 8 credits. You pay all regular university fees.

Non-Credit Vocational Courses

Practice Shop Work (Not for college credit)
Vocational printing courses listed are offered.

011 Composing Machines Su
Markup, tape preparation and fundamental operation of phototypesetting machines. 320 clock hours.

012 Offset Camera, Stripping, Platemaking Su
Engraver's camera, 120 hours; imposition and stripping, 160 hours; platemaking, 40 hours.

013 Offset Presses Su
Paper stocks and inks, 40 hours; moisture and inking systems, 80 hours; operation, 200 hours.

Undergraduate Courses

111 Basic Presswork 3(2,4) S
Concentrated study of the offset lithographic principles and their applications. Areas covered include impositions, stripping and operation of small offset presses.

112 Introduction to Graphic Arts 3(2,2) F
Basic reproduction processes, their history, development and scope. The nature and position of the industry in society.

113 Composing Machines 3(2,2) S
Exposure to the areas of hot and cold type composition and equipment. Majority of the course deals with phototypesetting equipment and systems and applications of computers to this subject matter.

211 Typography 3(2,2) F
Discussion and practical experiences in the concepts of design and layout and their relation to advertising and commercial products.

212 Bindery, Finishing and Distribution 3(2,2) S
Finishing, bindery and distribution equipment, paper handling and control, automatic systems, packaging and mailroom delivery functions.

213 Reproduction Photography 4(2,2) S
In-depth study of high contrast process camera photography. Subject matter studied includes line and halftones, PMT, special effects, posterizations and duotones.

214 Pricing 3(3,0) S
Theory of pricing, utilization of cost finding methods, record keeping and standards of the industry.

311 Plant Administration 3(3,0) F
Management principles with emphasis on the problems of operation and control. Legal and tax requirements; forms of business organization; office and records.

312 Media Personnel Management 3(3,0) F
Basic personnel processes involved in the procurement, development and maintenance of human resources as applied generally and specifically to graphic arts industry.

313 Media Labor Management 3(3,0) S
Labor administration and relations; labor market trends; development of labor law judicial and arbitration decisions, current administrative policy.

314 Sales, Promotion and Marketing 3(3,0) S
Promotion, advertising, circulation customs, practices and theory of marketing in commercial and newspaper applications.

315 Advanced Presswork 3(2,3) F
Comprehensive study of the reproduction of high quality four color process printing. Imposition, stripping techniques, operation of large offset presses and maintenance will be covered.

411 Estimating 3(3,0) S
Cost finding, variables in production, man- and machine-hour rate determination. Individual plant pricing system development and use.

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) F
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 Cooperative Education/Internship/Field Experience (Topical) 1-12 FSSu
Supervised experience in printing. P, consent of department program coordinator.

Latin American Area Studies Program

Associate Professor Bates, Department of Foreign Languages, coordinator

You can 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 program.

This program prepares you for additional vocational opportunities in Agriculture, Home Economics, Nursing, Foreign Service, Peace Corps, import-export business numerous positions with government, the United Nations and private corporations involved with or in Latin America. It should also facilitate improved communication and understanding between the peoples of these countries and the U.S. Courses should be integrated with the student's vocational major. See a Faculty Adviser and the Coordinator of the program.

Curriculum in Latin American Area Studies

(Minimum of 22 credit hours as indicated below)

Section A	**Credits**
1st Year Spanish, Span 101-102	4-4
2nd Year Spanish, Span 201-202	3-3
Spanish Comp/Conversation, Span 311-312	2-2
Minimum Sub Total	8

Section B	**Credits**
Spanish Am Lit, Span 365	3
Spanish Am Civilization, Span 436	2
20th Century Spanish Am Lit, Span 484	3
Directed Study in Spanish, Span 490 (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 312	3
(LAAS courses)	
Latin Am Cultures (Topical), Hum 301	3
Directed Studies in Latin Am Cultures, Hum 401	1-3
Minimum Sub Total	14

Recommended Electives

(Additional courses in Spanish are strongly recommended.)

Human Development in Poverty Families, CDFR 363	2
Human Nutrition, NFS 321	3
Comparative Econ Systems, Econ 405	3
International Econ, Econ 540	3
Current World Prob, PolS 253	3
International Politics, PolS 351	3
International Law & Organizations, PolS 356	3
Political Theory, PolS 461-462	3
Cultural Anthropology, Anth 220	3
Gen Anthropology, Anth 200	3
Population Problems, Soc 362	3
Community Development, Soc 440	3
Am Diplomatic History, Hist 468	3

Mathematics (Math)

College of Engineering

Professor Yocom, Head; Professors Bennett, Bergum, Richards; Professors Emeriti Engebretson, Kranzler, Walder, Wente; Associate Professors Ayers, Bryn, Clever, Kemp, Lacher, Monahan, Nielsen; Assistant Professors Broschat, Struck, Trapp, Vandever; Instructor Schmidt.

Major Programs

The mathematics degree programs provide a strong liberal arts emphasis with opportunity for concentrated study in mathematics to meet the needs of the technically oriented student, the prospective secondary mathematics teacher and the student preparing for graduate studies.

Beginning with Math 123, the B.A. major program requires 32 semester credits in mathematics while the B.S. major requires 36. Mathematics majors who must take Math 113 as a prerequisite for succeeding courses will be allowed 5 credits toward the 128 semester credits required for graduation. Mathematics majors must earn at least a "C" in Math 224 and all succeeding mathematics courses. In the curricula below, courses in the physical, biological and social sciences have been chosen to provide a strong background for students planning on graduate study or careers in business, industry or teaching. Students taking the Secondary Education option should consult with the Dean of the Division of Education before registering for their junior year. One semester of their senior year is devoted to education courses and student teaching. Consult the Arts and Science section for college graduation requirements.

Cooperative Education

The opportunity for experience in business and industry is available to mathematics majors through the Mathematics Cooperative Education Program. Credit for this on-the-job experience may be arranged by enrolling in Math 494.

Minor Program

A minor in mathematics consists of Math 123 (or Math 222), Math 224 plus a minimum of 11 credits from the 200 series or above. An average grade of "C" in the minor coursework is required. Math 355 and 361 are required of minors in the Secondary Education option.

General Information

Credit for Math 111 will be given to students showing high proficiency on the algebra placement test. Credit for Math 113 will be given to students exhibiting high proficiency on the algebra and the trigonometry placement tests. Placement in succeeding courses is based on the proficiency of the student.

Entering students with 1 1/2 units of high school algebra and better than average ability in mathematics should not enroll in Math 111.

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

Pre-calculus courses will not count toward graudation in Engineering except under special circumstances approved by the Dean of Engineering.

Beginning courses are available for students entering at times other than the fall semester.

Curriculum in Arts and Science, Mathematics Major

Leading to the Bachelor of Arts degree

Freshman Year	**Credits**
Fr. Comp, Engl 101 or 191	3
Speech, SpCm 101	3
Alg & Trig, Math 113	5
Math Anal I, Math 123	5
Foreign Language*	8
PE 100	2
Social Science electives**	3
Electives	3
Total	**32**

Sophomore Year	
Math Anal II, Math 224	4

Math Anal III, Math 225	3
Elem Logic & Sets, Math 353	2
Foreign Language*	6
Social Science electives**	6
Humanities electives**	6
Electives	5
Total	**32**

Junior Year

Jr Comp, Engl 300	3
Adv Expo, 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
Total	**33**

Senior Year

Math electives (300 level or above)	6
Humanities electives**	6
Electives	19
Total	**31**

*Two years of one foreign language (French, German, or Spanish)
**From at least two areas

Curriculum in Arts and Science, Mathematics Major

Leading to the Bachelor of Science degree

Freshman Year	**Credits**
Fr Comp, Engl 101 or 191	3
Speech, SpCm 101	3
Alg & Trig, Math 113	5
Math Anal I, Math 123	5
Chem 110 or 112	4
Biol Sci electives	6
PE 100	2
Electives	4
Total	**32**

Sophomore Year

Math Anal II, Math 224	4
Math Anal III, Math 225	3
Computer Prog & Data Proc, Math 271	4
Elem Logic & Sets, Math 353	2
Gen Physics I, Phys 211	4
Gen Physics II, Phys 213	4
Prin of Econ I, Econ 201	3
Social Science elective*	3
Humanities electives*	5
Total	**32**

Junior Year

Jr. Comp, Engl 300	3
Adv Expo, Engl 303	3
Math electives (300 level or above) (Select 3 of Math 313, 315, 425, 426)	12
Social Science electives*	6
Humanities elective*	3
Electives	5
Total	**32**

Senior Year

Math Electives (300 level or above)	6
Electives	26
Total	**32**

*From at least two areas

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
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

101 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.

111 Algebra 3(3,0) FSSu
Set concepts, basic properties of real numbers, factoring of polynomials, solution of linear and quadratic equations, inequalities, systems of equations, exponents and radicals. Credit for Math 111 will not be granted to anyone who has previously received credit in Math 113. P, 1 unit of high school algebra.

113 College Algebra & Trigonometry 5(5,0) FS
The real number system as related to linear, quadratic, rational, trigonometric, exponential, logarithmic and inverse functions and their applications. Other topics selected from mathematical induction, complex numbers, partial fractions, determinants, matrices, theory of equations, sequences & series. P, 1½ units of high school Algebra. Credit will not be allowed for Math 113 in addition to credit in Math 120.

120 Plane Trigonometry 3(3,0) FS
Trigonometric functions, equations and identities; inverse trigonometric functions; exponential and logarithmic functions, and applications of these functions. P, 111 or equivalent.

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, 1½ units of high school algebra, or equivalent.

123, 224, 225 Mathematical Analysis I, II, III 5(5,0), 4(4,0), 3(3,0), FSSu
123: 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.

224: Calculus of exponential, logarithmic, trigonometric, and inverse functions, methods of integration, polar coordinates, arc length, 2 and 3 dimensional vectors, solid analytic geometry.

225: Indeterminate forms, improper integrals, Taylor's formula, infinite series, vector values functions, partial derivative, multiple integrals, selected physical applications. P, 1½ units of high school algebra, ½ 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) FS

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.

271 Computer Programming & Data Processing 4(3,2) FS

An appreciation of the use of computer use for non-engineers. FORTRAN programming, flow charting, data processing techniques, evaluation of computer hardware, binary arithmetic, elementary numerical analysis and optimization applications. P, 111 (with C or better) or equivalent.

313 Modern Algebra 3(3,0) F

Groups, rings and fields. Homomorphism theorems. P, 224, 353 or consent.

315 Linear Algebra 3(3,0) S

Vector spaces, linear transformations and matrices. P, 215, 353 or consent.

321 Differential Equations 3(3,0) FSSu

Ordinary differential equations including first order, higher order linear and systems of linear equations. General solutions and solutions to initial-value problems using matrices, Laplace transforms (in engineering sections) and power series and applications to physical science and geometry. P, 225.

331 Advanced Engineering Math 3(3,0) FS

Fourier series, Laplace transforms, and topics selected from: matrices, determinants, complex variables, partial differential equations, numerical methods and vector analysis. P, 321.

353 Elementary Logic & Set Theory 2(2,0) FS

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

355 Topics in School Math 3(3,0) S (Even Years)

Symbolic logic, set theory, functions, groups, rings, fields and related topics as they apply to a modern high school program. P, Math 224 or consent.

361 College Geometry 3(3,0) F

A modern approach to Euclidean and non-Euclidean plane geometry. P, 224 or consent.

373 Intro to Numerical Computation 3(3,0) F

Mathematical models, algorithms, sources of error, computer solution of systems of linear equations, non-linear equations; quadrature, approximation, and interpolation using the computer. P, Math 224, and knowledge of FORTRAN IV.

381 Mathematical Statistics 4(4,0) FS

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, 224.

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, 353.

425-426 Intro to Real Analysis I-II 3(3,0) FS

Topology of n-space, inner product, norm, Heine-Borel Theorem, convergence and uniform convergence. Cauchy criterion, liminf, limsup, double and 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, 353.

433 Laplace Transform 3(3,0) (On demand)

Main features of Laplace transform theory. P, 321 or consent.

461 Intro to Topology 3(3,0) F

A first course in point-set topology, covering the elementary concepts of metric and general topological spaces; closure, interior, boundry, conneted-ness, compactness, and separation. Special attention is given continuity of functions. P, 225, 353.

490 History of Mathematics 3(3,0) S

A general presentation of historical topics in mathematics emphasizing contributions to mathematics from ancient civilizations; developments leading to the creation of modern geometries, calculus and modern algebra; and contributions of outstanding mathematicians. P, 224 or consent.

491 Special Topics 1-3(1-3,0)

Limited to a total of 9 hours credit.

494 Cooperative Education/Internship/Field Experience 1-6 FSSu

Planned and supervised professional experience related to mathematics which takes place outside the formal classroom with private business or industry, or public agencies. P, consent of department program coordinator.

Graduate Courses

521-621 Complex Variables 4(4,0) F (On demand)

Algebra of complex numbers, classifications of functions, differentiation, integration, mapping, transformations, and infinite series. P, 225.

523-524 — 623-624 Advanced Calculus 3(3,0) FS (On demand)

Set theory, real number system, topology of Cartesian n-space, convergence, continuous functions; differentiation, integration, and infinite series. P, 225 or equivalent.

527-627 Vector Analysis 3(3,0) (On demand)

Vector algebra, vector functions, vector calculus with emphasis on various physical applications. P, 225.

531-631 Partial Differential Equations 3(3,0) S (On demand)

Series, solutions, total differential equations, simultaneous equations, approximate solutions, partial differential equations of first and second orders, application. P, 321.

566-666 Projective Geometry 3(3,0) S (On demand)

A synthetic and/or analytic approach to geometric properties invariant under projective transformations: Theorems of Desargues, Pascal, Brianchon and applications. P, 224 or consent of instructor.

571-671 Numerical Analysis 3(3,0) S

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.

583-683 Theory of Probability 3(3,0) F

Topics in probability emphasizing applications including an introduction to axiomatic probability, random variables, and discrete stochastic processes such as random walks, Markov chains, and queueing theory.

790 Thesis 5-7 as arranged

793-794 Advanced Topics 1-3(1-3,0) FS

Mechanical Engineering (ME)

College of Engineering

Professor Hooks, Head; Professors Christianson, Knofczynski; Professor Emeritus Sandfort; Associate Professors Mikesell, Sharma; Associate Professor Emeritus Paradise; Instructor Delfanian.

Mechanical Engineering is classified into three major divisions; heat-power-concerning the conversion of energy to perform useful work, and with transfer and utilization of heat; machine design — involving design and development of machines, products and their components; industrial engineering — encompassing areas of production, manufacturing problems and management techniques.

This curriculum is planned to give a thorough training in the basic sciences of mathematics, chemistry and physics, and a well balanced series of courses in mechanics, metallurgy, machine design, thermodynamics, electrical fields and circuits, and others.

Opportunity is given in the senior year for considerable specialization in various technical option areas according to your interest and abilities. These include aeronautics, thermal engineering, industrial engineering, machine design, nuclear engineering, and environmental engineering. Elective courses are provided for flexibility in curricu-

lum. Technical electives must be approved and must total at least 11 credits, including two design courses.

Six credits of humanities and nine credits of social science electives are provided to strengthen cultural growth, and are to be selected from the lists on pages 21-22. Three credits of free electives offer students the opportunity to pursue their interests.

Classroom theory is supplemented with experimental work in laboratories. Design classes apply engineering fundamentals to the solution of real engineering problems.

The department will help interested students arrange cooperative work/study programs with industry. Credit may be obtained for these work experiences, by prior arrangement, by registering for ME 494 Cooperative Ed/Internship/Field Experience. Only in exceptional cases, however, will these credits fulfill part of the minimum Technical-elective requirements above. See page 21 for more information on cooperative programs at SDSU.

In addition to the Graduation Requirements and Academic Performance Requirements specified on pp. 15 and 11-13 of this catalog, the following grade requirements must be met to earn a Bachelor of Science Degree in Mechanical Engineering: you must have an *average* grade of C, or better, in courses taken in the Mechanical Engineering and Mathematics Departments. In addition, you must have a grade of C or better, in *each* of these courses; EM 221, EM 222, EM 321, EM 331, ME 311 and ME 312.

Curriculum in Mechanical Engineering

(Accredited by the Accreditation Board for Engineering and Technology)
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 (preferred) or 110-120	4	3
Fr Comp, Engl 101, or Speech, SpCm 101 (either order)	3	3
Engineering Design Graphics I-II, EG 121-122	2	2
General Physics I, Phys 211		4
Fitness & Lifetime Activities, PE 100	1	1
Orientation for Engineers, GE 110	0	
Electives	2	
Sophomore Year	**F**	**S**
Mathematical Analysis III, Math 225	3	
General Physics II, Phys 213	4	
Statics, EM 221	3	
Metal Processing, ES 225-235	1	1
Computer Programming, CSc 312	2	
Electives	4	
Differential Equations, Math 321		3
Dynamics, EM 222		3
Engineering Materials, ME 241		3
Atomic Physics, Phys 331		3
Prin of Econ I, Econ 201		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
Advanced Exposition, Engl 303		3
Thermodynamics I-II, ME 311-312	3	3
Heat Transfer, ME 415		3
Basic Electrical Engineering I-II, EE 305-306	3	5
Kin. & Dyn. of Mach. Elements, ME 321		3
Mechanical Engineering Lab I, ME 376		2
Electives	2	
Senior Year	**F**	**S**
Design of Machine Elements, ME 421	4	
Metallurgy, ME 341	3	
Automatic Controls, ME 451	3	
Mechanical Engineering Lab II-III, Me 476-477	1	1
Electives	6	15
Inspection Trip, ME 480	0	

Suggested Elective Groups

Aeronautics	**Credits**
Aerodynamics, ME 431	3
Advanced Engineering Math, Math 331	3
Advanced Fluid Mechanics, EM 531	3
Gas Dynamics I, ME 531	3
Environmental Engineering	
Heating, Ventilating & Air Conditioning I, ME 411	3
Heating, Ventilating & Air Conditioning II: Design, ME 419	3
Environmental Chemistry, Chem 380	4
Environmental Engineering, CE 523	3
Environmental Conservation, WL 210	2
Physical Climatology & Meteorology, AE 353	3
Water Supply Engineering, CE 327	4
Industrial Engineering	
Industrial Engineering, ME 362	3
Methods Engineering & Work Measurement, ME 361	2
Analysis & Design of Industrial Systems, ME 461	3
Mathematical Statistics, Math 381	4
Quality Control and Reliability, ME 562	3
Intro to Operations Research, ME 561	3
Machine Design	
Machine Design, ME 428	2
Vibrations, ME 322	3
Advanced Engineering Math, Math 331	3
Nuclear Engineering	
Atomic & Molecular Spectra, Phys 437	3
Introductory Nuclear Physics, Phys 433	3
Reactor Physics, Phys 535	3
Advanced Engineering Math, Math 331	3
Thermal Engineering	
Heating, Ventilating & Air Conditioning I, ME 411	3
Heating, Ventilating & Air Conditioning II: Design ME 419	2
Internal Combustion Engines, ME 412	3
Design of Thermal Systems, ME 418	3
Turbomachinery, ME 413	3

Undergraduate Courses

241 Engineering Materials 3(3,0) FS
Material structures from atoms, crystals, phases, microstructures to macrostructures. Theory of mechanical stresses, thermal reactions, corrosion, electromagnetic fields, and radiation. P, ES 225; Chem 114 or 120.

311-312 Thermodynamics I & II 3(3,0) 3(3,0) FS
Thermodynamic properties of gases, vapors and mixtures. First and Second Laws of Thermodynamics. Concepts of availability, irreversibility and equilibrium. Stoichiometry. Engineering application of principles basic to thermodynamic cycles, compressible flow through nozzles and turbine blades and power and refrigeration systems. P, Phys 211, Math 225.

313 Analytical Thermodynamics 3(3,0) FS
Thermodynamic properties and laws, statistical thermodynamics, kinetic theory and transport phenomena. Irreversible thermodynamics, applications to direct energy conversion devices. P, Phys 331, Math 321.

314 Thermodynamics 3(3,0) FS
Terminal course for non-mechanical engineering students. Fundamental equations of thermodynamics. Properties of gases and vapors. Thermodynamic cycles. P, Phys 211, Math 225.

321 Kinematics & Dynamics of Machine Elements 3(1,4) S

Analysis of motion and design of linkages, cams, belts, gears, gear trains, and planetary gears. Graphical solution of velocities, accelerations, forces, interia forces, balancing and synthesis of various machine elements. P, EG 122, EM 222, CSc 312.

322 Vibrations 3(3,0)*

Free and forced vibration of single-degree-of-freedom systems. Vibration measurement, transmission and isolation. Nonlinear effects. Multi-degree-of-freedom systems; matrix methods. Introduction to continuous systems and random vibration. P, EM 222, Math 321.

341 Metallurgy 3(1,4) FS

Crystalline structure and physical properties of metals, phase transformation diagrams, effect of mechanical or thermal treatment on grain structure of ferrous and non ferrous alloys. Laboratory demonstrates fundamental principles and presents necessary techniques of metallography. P, 241.

361 Methods Engineering & Work Measurement 2(0,4) F

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) FS

Modern industrial engineering. Planning, organizing and directing industrial enterprises. Quantitative analysis of management problems in production planning and control, quality control, reliability, facility planning and PERT. Applications and examples from realistic situations. P, CSc 312.

376 Mechanical Engineering Lab I 2(1,3) FS

Instruments for measuring pressure, temperature, flow, strain, vibration and sound. Experimental data analysis for accuracy, error and uncertainty. P, 311.

381 Mechanical Equipment of Buildings 3(3,0)*

Heating, ventilation and air conditioning systems, control and servicing. Refrigeration, plumbing systems and their maintenance. Fire and explosion prevention in buildings. P, Phys 104 or consent.

400 Seminar 1(1,0)*

Recent research and development in mechanical engineering, related fields. P, senior standing.

411 Heating, Ventilating & Air Conditioning I 3(3,0) F

Comfort and health requirements for space conditioning. Psychrometrics, steady flow processes involving air-water vapor mixtures. Heating load calculations. Solar heating systems. Emphasis on systems design approach. P, 312 or 314.

412 Internal Combustion Engines 3(3,0) F

Theory, design and operation of spark ignition and compression-ignition engines. Combustion analysis, efficiencies and performance. Knock phenomena, exhaust gas analysis and air pollution. Use of equilibrium charts. P, 312 or 314.

413 Turbomachinery 3(3,0) S

Theory, design, operation and energy transfer in Turbomachines. Steam, gas and hydraulic turbines. Pumps, fans and centrifugal and axial flow compressors. P, 312.

415 Heat Transfer 3(3,0) FS

Theories of conduction, radiation and convection and their utilization in engineering applications. P, EM 331, Math 321.

418 Design of Thermal Systems 3(3,0*

Systems approach to design, mathematical modeling, simulation and optimization of systems, with particular emphasis on thermal systems. P, EM 312, 331, concurrent with 415.

419 Heating, Ventilating & Air Conditioning II: Design 3(2,2) S

Cooling load calculations. Analysis of vapor compression and absorption cycles. Solar cooling. Analysis and design of complete heating and air conditioning systems. Use of computer programs as design aids. P, 411 or consent.

421 Design of Machine Elements 4(4,0) FS

Properties of materials, fundamental mechanics, working stresses, fabrication and proportioning of part sizes involved in design of fastenings, shafting, flywheels, gears, bearings, and other machine elements. P, EM 321, concurrent with 321.

428 Machine Design 2(0,6) S

Actual stress analysis and design of complex machines, using basic engineering concepts and modern industrial practices. Emphasis on originality and creativity; opportunity for students to select projects of particular interest. P, 421.

431 Aerodynamics 3(3,0)*

Airfoil characteristics, wing shapes, static and dynamic forces, viscosity phenomena, boundary layer theory, flaps and slots, propellers, stability, control and performance. P, EM 331.

451 Automatic Controls 3(3,0)* F

Control systems and components. Laplace transform and transfer function. System analysis by frequency-response and root locus method. System compensation. Analog simulation. Application to hydraulic, pneumatic and electromechanical systems. P, 322, or consent.

461 Analysis & Design of Industrial Systems 3(3,0* S

Problems in product design and development, marketing, forecasting, capacity evaluation, plant layout, materials handling from standpoint of interrelated and integrated systems. P, 362 or consent.

476 Mechanical Engineering Lab II 1(0,3) FS

Continuation of ME 376, Water analysis. Application of the laws of thermodynamics and fluid mechanics. Internal combustion engines and single and multi-stage compressors. Compressible fluid flow measurement and behavior in nozzles and orifices. Heat exchanger analysis. P, 376, 312; EM 331, concurrent with 415.

477 Mechanical Engineering Lab III 1(0,3) FS

Continuation of ME 476. More thorough and independent investigation of steam turbines, fans, axial flow compressors or air conditioning equipment. Independent projects. P, 476.

480 Inspection Trip (0) FS

Short inspection trips arranged to give students opportunity to observe and evaluate manufacturing and industrial processes, operations and facilities. P, senior standing.

490 Special Problems 1-5*

May be analytical, design, or laboratory studies.

494 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.

495 Special Topics 1-5

*On sufficient demand.

Graduate Courses

511-611 Statistical Thermodynamics 3(3,0)

Review of classical thermodynamics. Principles of kinetic theory and classical statistical mechanics. Principles of quantum mechanics, quantum statistics, partition functions, and thermodynamic properties. P, 312, Math 321, Phys 331 or consent.

512-612 Thermo-Fluid Energy Systems 3(3,0)

Review of viscous fluid flow, basic modes of heat transfer and thermodynamic energy conversion. Discussion of energy sources, uses, conversation, transmission and economics. Analysis of conventional energy generation, storage and transmission systems. Criteria for design and analysis of energy systems such as nuclear, wind, solar, geothermal, etc. P, 312, 415; Math 331 or equivalent.

521-621 Modeling & Simulation of Dynamic Systems 3(2,3)

Application of physical laws, mathematical methods and computers to the development and analysis of models of advanced dynamic systems of engineering interest. Analog simulation by using analog/hybrid EAI 380 computer. Digital logic and parallel hybrid simulation. Digital simulation by using FORTRAN and IBM System/370 digital computer. Continuous system simulation languages. Emphasis is on the methods of modeling and simulation rather than the systems modeled. P, Math 321 and consent.

522-622 Applied Stress Analysis in Mechanical Design 3(3,0)

Advanced solutions of practical stress analysis problems related to mechanical structures and machine components. Elasticity equations and energy theorems. Stresses in thin walled structures and stability analysis. Discrete structures by matrix force and matrix displacement methods. Continuous structures by finite element methods. Application to mechanical design problems. P, 421, Math 331 or consent.

531-631 Gas Dynamics I 3(3,0)

Objectives, applications, and scope of the subject. Methods of fluid dynamics and thermodynamics. Compressible flow in ducts, nozzles and diffusers. Propagation of plane waves; shock dynamics, characteristics, interaction of waves. General theorems of gas dynamics. P, 213, EM 331, Math 331.

532-632 Viscous Flow Theory I 3(3,0)

Fundamental laws and equations of motion for a viscous fluid; exact and approximate solutions for the laminar boundary layer; creeping flow; flow in internal passages; secondary flow; compressible boundary layers; thermal boundary layers in laminar motion. P, EM 631.

541-641 Advanced Metallurgy 3(3,0)
Crystal lattices and diffraction by crystals. Structure determination, defects, registration by micro-scopic methods, single crystal orientation and stress analysis caused by phase transformation. P, 341, Math 321.

551-651 Advanced Analytical Methods 3(3,0)
Practical engineering differential systems are examples for developing solution techniques. Functional approximations, coordinate changes, numerical methods, integral solutions, orthogonal functions, and Green's functions are discussed. Solutions are related to the original engineering systems. P, Math 331 or permission.

561-661 Intro to Operations Research 3(3,0) F
History and organization of operations research, mathematical and statistical models in industrial decisions. The evaluation of alternatives by means of linear programming, queueing theory, deterministic and stochastic inventory models, game theory and simulation. P, 362, Math 381 or consent.

562-662 Quality Control & Reliability 3(3,0)
Application of statistical techniques to control quality and development of economical inspection methods. Collection, analysis, and interpretation of operations data; control charts and sampling procedure. P, 362, Math 381 or consent.

563-663 Topics in Reliability Engineering 3(3,0)
Probability concepts and typical models involved in statistical prediction of reliability. Methods for estimating required parameters from experimental data. Reliability and maintainability techniques in practice and a survey of recent developments in the field. P, 662 or consent.

690 Special Problems 1-5
695 Special Topics 1-3
711 Advanced Heat Transfer I 3(3,0)
728 Advanced Machine Design 3(3,0)
731 Gas Dynamics II 3(3,0)
751 Computer-Aided Design 3(3,0)
761 Decision Theory 3(3,0)
762 Systems Analysis 3(3,0)
790 Thesis 5-7 as arranged
794 Special Problems 1-3
795 Special Topics 1-3

Mechanized Agriculture (MA)

College of Agriculture and Biological Sciences

Professor Moe, Head; Professors Chu, DeBoer, Hellickson, Myers, Wiersma; Professor Emeritus DeLong; Associate Professors Durland, Lubinus, Lytle, Schmer, Ullery; Assistant Professors Alcock, Christianson, Julson, Lush, Pahl, Schipull; Instructors Bender, Cluever, Kelley, Stange.

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, 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 or 191, Speech, SpCm 101	3	3
Welding, ES 131		2
Fitness & Lifetime Activities, PE 100	1	1
General Chemistry, Chem 110 or 112-114	4	
Algebra and Plane Trigonometry, Math 111-120 or Math 113	3	3-5
Machine Shop, ES 121	2	
Biological Science electives†		3
Agricultural Mechanics, MA 202	2	
Introduction to Sociology, Soc 100		3
Sophomore Year	**F**	**S**
Chemistry elective (Not Chem 100)	3	
Mathematics of Finance, Math 241	3	
Engineering Design Graphics, EG 121	2	
Soils, PS 113		3
Farm Power & Machinery, MA 213	3	
Computer Programming, CSc 311		3
Social Science Elective		3
Group I elective*	6	3
Humanities Elective‡		3
Junior Year	**F**	**S**
Junior Composition, Engl 300		3
Electricity for Farm and Home, MA 342	2	
Econ 201 or Econ 202	3	
Soil & Water Mechanics, MA 333		3
Elementary Physics I-II, Phys 111-113	4	4
Elective & Option courses	4	4
Humanities Elective‡	3	
Communication Elective**		2
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, B-Ad 350	3	
Principles of Accounting I, Actg 210	3	
Elective		3
Seminar, AE 471	1	
Elective & option courses	6	3
Energy and Agricultural Technology, MA 492		3
Agricultural Waste Management, MA 463	3	

* Students majoring in Mechanized Agriculture may not use Mechanized Agriculture courses to satisfy the Group I requirements. Group I requirements include Plant Science 113 plus 9 additional credits from Group I.
** See College of Agriculture and Biological Science Core Curriculum Requirements.
† Courses must be selected from the following areas: Botany, Biology, Entomology-Zoology, Plant Science, Microbiology.
‡ 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
Principles of Economics II, Econ 202	3
Money and Banking, Econ 330	3
Business Management, B-Ad 360	3
Statistical Methods I, Stat 341 or equivalent	3
Business Finance, B-Ad 310	3
Business Elective	3
Farm & Ranch Management, Ag Econ 271	4

Science & Production Option

Course	Credits
General Microbiology, Micr 231	4
Biological Science electives+	7
Chemistry	7
Mathematics and/or Physics	4

Science electives	6
Animal Science electives	9
Plant Science electives	9
Small Power Equipment, MA 433	2

Irrigation Option

Course	Credits
Forage Crops and Pasture Management, PS 313	3
Soil Fertility & Fertilizers, PS 323	3
Vegetable Growing, Hort 212	3
Conservation & Management of Soils, PS 372	2
Physical Environment of Soils & Plants, PS 352	2
Irrigation, PS 483	3
Geology, PS 243	3
Principles of Plant Pathology I, PS 223	3
Plant Kingdom, Bot 201	3
Elementary Surveying, CE 106	3
Mathematics and/or Physics, Chemistry	6

Equipment & Processing Option

(15 credits to be selected from following courses)

Course	Credits
Grain & Seed Production & Processing, PS 312	2
General Microbiology, Micr 231	4
Food Microbiology, Micr 311	3
Dairy Product Processing I, DS 321	5
Vegetable Growing, Ho 212	3
Principles of Plant Pathology I, PS 223	3
Meat & Meat Processing, AS 241	3
Meat Processing Lab, AS 242	1
Experimental Foods, NFS 341	3
Experimental Testing & Development n 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	2
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

*Students enrolled in this option must file an application with the Agricultural Education Office prior to for their junior year or in professional education courses.

MINOR REQUIREMENTS: MA 202, 213, 333, 342, plus 6 hours from the following: MA 423, 433, 443, 463, and 490.

Undergraduate Courses

202 Agricultural Mechanics 2(1,2) FS

Wood and concrete building materials; efficient construction procedures; hand tools, portable and stationary power tools; safe working practices.

213 Farm Power & Machinery 3(2,2) FS

Tractors and farm machinery from the standpoint of operation, repair, preventative maintenance, safety, cost of operation, and efficiency. Theoretical and practical aspects of calibration, hydraulic systems, fuels, lubricants, and power trains. Sophomore standing.

252 Auto Mechanics 2(1,2) FS

Engine tune-up, servicing and repairing engine accessories; testing valves, carburetors, ignition systems; installing new rings, valves, and general work required of mechanics.

333 Soil & Water Mechanics 3(2,2) FS

Engineering phases of soil and water conservation; elementary measurements and surveying and application to field problems; design and layout of conservation, drainage and irrigation practices.

342 Electricity for Farm & Home 2(1,2) FS

Circuits, wiring, lighting, appliances, operating principles of electric motors, organization and financing of rural electric cooperatives and distribution systems plans.

423 Farm Building Mechanization 3(2,2) FS

Materials and construction techniques for farm buildings. Special attention to planning mechanization of livestock housing facilities, feeding operations, and manure removal systems.

433 Small Engines and Equipment 2(1,2) S

Selection, operation and maintenance of internal combustion powered equipment developing up to 15 horsepower. Engine disassembly, assembly and tune-up. Set-up and adjustment of associated pieces of equipment and accessories.

443 Processing Equipment for Agricultural Products 3(2,2) F

Mechanics, refrigeration, heat transfer, instrumentation, and equipment operation as applied to materials, handling, storing, preserving, packaging and processing agricultural products.

452 Teaching Agricultural Mechanics 2(1,3) FSSu

Shop management, safety, shop plans, selection, care, and use of hand and power tools and equipment to be taken as part of student teaching block in Agricultural Education. P, senior in agricultural education. Offered first half of semester. P, MA 202.

463 Agricultural Waste Management 3(3,0) F

Agricultural related pollution and waste problems. Handling, treating and disposing wastes to minimize environmental pollution.

490 Special Problems 1-3

Must have approval of advisor and department head.

492 Energy & Agricultural Technology 3(3,0) S

Evaluation of local, regional, national and world energy resources and their relation to the agricultural industry. Energy conversion, technology, conservation and management. Future energy source and energy from agricultural products. P, senior standing or instructor consent.

494 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)

A. Agricultural Machinery, 1982. B. Soil and Water Mechanics, 1983. C. Small Power Units, 1984. D. Agricultural Power Units, 1985. E. Electric Motors and Electrical Controls, 1986. F. Agricultural Structures and Environment, 1987. G. Welding, 1988. 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 1982)

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 1982)

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 1982)

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 1983)

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 1983)

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 Pengra, Acting head; Professors Baker, Sword, Westby; Professor Emeritus Semeniuk; Associate Professors Hillam, Kirkbride, McAdaragh; Assistant Professors Gauger, Shave, Stangeland

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 Medical Technology (CLT), Chemistry, Biology, and 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 minor in Microbiology is offered with satisfactory completion of 16 credits in Microbiology, including General Microbiology (Micr 231).

Curriculum in Agriculture, Microbiology Major

Leading to the Bachelor of Science degree

	Credit		
Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	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 222-224 (or Organic Chemistry, Chem 120 & Chem elective)	4		4
General Microbiology, Micr 231	4		
Cytology and Nutrition, Micr 332			4
Principles of Economics I, 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
Microbiology elective			3
Junior Composition, Engl 300			3
Immunology, Micr 422	3		
Social Science elective (approved list)	3		
Senior Year	**F**		**S**
Seminar, Micro 440	1		1
Genetics, Biol 371	3		
Microbiology electives	4		4
Biochemistry, Chem 260			4
Electives (recommended Quantitative Analysis, Chem 232; Statistical Methods I, Stat 341; Computer Programming & Data Processing, CSc 271	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 or 191	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, Sta)341			5
Sophomore Year	**F**		**S**
Organic Chemistry, Chem 222-224 (or Organic Chemistry 120 & Chem elective)	4		4
General Microbiology, Micr 231	4		
Cytology & Nutrition, 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)	4		4
Biochemistry, Chem 260	4		
Microbiology elective			3
Immunology, Micr 422	3		
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 & Data Processing, CSc 271; 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 or 191	3	or	3
Fundamentals of Speech, SpCm 101	3	or	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 222-224 (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	
Cytology & Nutrition, Micr 332		4
Principles of Economics I, 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	3	
Biochemistry, Chem 260	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 & Data Processing, CSc 271 (or General elective)		4
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

PS 223 Principles of Plant Pathology I, 3(2,2) F
(See description in Plant Science)

231 General Microbiology 4(2,4) FSSu
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 3(2,3) F
Microbiology of fresh and processed meats, dairy products, vegetables and modern convenience foods. Laboratory quality study of food preservation, processing spoilage. P, 231.

332 Cytology & Nutrition 4(2,4) S
Morphology, cytology, nutrition, metabolism and growth of microbial cells. P, 231.

412 Soil Microbiology 3(2,3) S
Microbial flora of agricultural soils and biochemical changes brought about by this flora. P, 231.

422 Immunology 3(2,3) 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 these etiologic agents. P, 231.

440 Seminar 1(1,0) FS
Presentation of topics based on microbiological literature in scientific journals. Senior status or consent.

441 Microbiology Problem (1-3) FSSu
Microbiological problems associated with current research or teaching. Practical laboratory experience is encouraged for seniors majoring in Microbiology. 6 credits maximum. P, consent of instructor and senior standing.

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

Zool 467 General Parasitology 3(2,3) S
(See description in Biology)

494 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. Recent topics have included anaerobic techniques, organ and tissue culture, aquatic Microbiology, and advanced medical Microbiology. P, senior standing and consent of instructor.

Graduate Courses

DS 522-622 Advanced Dairy Microbiology 4(2,4) S
(See description in Dairy Science.)

524-624 Virology 3(2,3) S
Viral characterization, structure and replication. Pathogenesis and pathology of viral diseases in man and animals. Laboratory exercises in viral structure, isolation and characterization. Pathology of animal viral infections. P, 422 or consent.

536-636 Molecular and Microbial Genetics 4(4,0) F
A basic course in molecular genetics. Examples to illustrate genetic principles are drawn from all forms of life. P, Bio 371. General microbiology recommended.

537-637 Systematic Bacteriology 4(2,4) F
Techniques for isolation, identification, classification, and preservation of bacterial cultures are presented. Current topic areas and theory in taxonomy and nomenclature are discussed in detail. P, 332 (or equivalent) and consent of instructor.

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) S (Offered in 1983)

738 Microbial Metabolism 4(2,4) S (Offered in 1984)

742 Graduate Seminar 1(1,0) FS

790 Thesis in Microbiology 5-7 FSSu

Military Science (Mil) (Army ROTC)

College of Arts and Science

LTC Todd, Professor of Military Science; Assistant Professors; MAJ Watson, MAJ Cunningham, CPT Bertholf, Instructor SGM Taylor, SFC Jay

Army ROTC offers two programs: the four-year program consisting of the basic and the adventure courses and the two-year program consisting of the advanced course preceded by a six-week basic camp. These programs are open to all those enrolled full time. **Tuition and fees are not charged for ROTC courses.**

The objective is to prepare you for continued education and development as commissioned officers in the U.S. Army Reserve or Regular Army. Instruction covers aspects of military science common to all branches of the Army. The aim, in conjunction with other college disciplines, is to provide some military education which develops

attitudes and understandings that facilitate transition to military service on a part- or full-time basis.

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.

Basic and Advanced Courses

The Basic Course, first two years of military science, is normally taken during the freshman and sophomore years. This is an orientation on the ROTC program to include organization of the services, evolution of warefare, and awareness of the objectives and instruments of national security and strategy. Basic development of principles of management and leadership through practical application and case study of historical examples. **By enrolling in the basic ROTC course, you make no commitment to the U.S. Government.**

The Advanced Course, last two years of military science, is normally taken during the junior and senior years but is also open to qualified graduate students, veterans, and members of National Guard/U.S. Army Reserves. The overall objective of the Advanced Course is to develop inherent capabilities as a leader and manager through attributes of self-discipline, integrity, and a sense of responsibility.

All those enrolled in the Advanced Course must:

(1) Have completed the Basic Course, Senior Division ROTC, or its equivalent, or received placement credit for honorable active service (Veteran or National Guard Basic), or have had 90 contact hours with the ROTC department, or take the freshman and sophomore ROTC classes during summer school.

(2) Be a U.S. citizen and able to complete the Advanced Course, graduate, and be commissioned prior to age 30. On a selected basis age waivers may be to age 34.

(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) Be selected by the Professor of Military Science and the president of this institution.

(6) Sign written agreement.

Upon completion of the Advanced program, students are eligible for commission as second lieutenants in the Army.

Army ROTC Advanced Camp

Attendance at Advanced Camp is required of those enrolled in the Advanced Course, normally upon the completion of the junior year. The six-week camp will ordinarily open in June. ROTC students attending camp will receive approximately $600. You are also paid a travel allowance and are furnished food, clothing, and quarters. Summer camp for SDSU is held at Ft. Lewis, Washington.

Provides practical instruction which supplements on-campus instruction by experience in both garrison and field training environments; opportunities to develop and demonstrate leadership capabilities in simulated tactical situations through problem analysis, decision making and troop leading experiences and challenges you physically and mentally.

Uniforms

Those enrolled in the Basic Course will be furnished a fatigue uniform to be worn during specified lab activities. Students enrolled in the Advanced Course are furnished an officer-type uniform and fatigues.

Monetary Allowance

Students enrolled in the Advanced Course are paid $100 a month, nontaxable, for up to 20 months. Selected students, concurrently members of the USAR/ARNG and Army ROTC, are eligible to receive reserve pay and Army ROTC entitlements. Additionally, South Dakota Army National Guard members receive state tuition assistance.

Army ROTC 2-year Program

Students who do not attend the Army ROTC Basic Course and transfer students may qualify for the Advanced Course by attending a paid six-week basic camp during the summer between the sophomore and junior years in lieu of the Basic Course.

Those interested in admission to the 2-year ROTC program should contact the Professor of Military Science of SDSU during the first semester of their sophomore year.

Transfer students should communicate with the PMS to determine eligibility.

Army ROTC Scholarship

The Army offers 4-year, 3-year, 2-year and 1-year scholarships. In general, these provide $100 per month, and finances to cover tuition, books and laboratory fees during specified periods. Students in ROTC may compete for the scholarships during the spring. Scholarships are awarded on the basis of grades, ROTC Qualifying Test scores, leadership ability and the individual's interests in an Army career. For more information, contact the Professor of Military Science or consult the Financial Assistance Handbook.

Requirement for Commission

On successful completion of the Advanced Course, including advanced camp, and graduation from a college or university, a candidate is eligible for a U.S. Army commission as a second lieutenant. Selected candidates may be commissioned into the Reserve Forces prior to graduation if all other criteria are met.

Courses

101-102 Military Science I 1(1,*) FS

Fundamentals of leadership and management. Organization of the Army and ROTC. Military geography and the use of maps. Fundamentals of marksmanship, military geography, and range firing.**

201-202 Military Science II 1(1,*) FS

Operations of military teams. Historical growth and development of the Army's role in national security. Emphasis on magnitude of the management implications. Functions, duties and responsibilities of junior leaders and their historical role. Military history, policies, experiences and tradition in peace and war.**

301-302 Military Science III 2(2,*), 3(3,*) FS

Case studies in military leadership and management. Analytical situations producing learning experiences through group dynamics and human relations. Delegation of authority and responsibility, span of control, coordination, planning and decision making. Evaluation of situations with emphasis on the student's ability to express managerial decisions clearly and with authority.**

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, management analysis of internship experience. P, 302.

401-402 Military Science IV 2(2,*), 3(3,*) FS

Functional role of a Lieutenant. Emphasis on small unit leadership and management. Provides detailed knowledge of staff operations, techniques of resource management, human relations skills and military law. Places you in a realistic staff or command role to gain actual experience prior to commissioning.**

Leadership Development Lab

Military Science I and II Laboratories

A series of labs on military-related subjects such as map reading, orienteering, recondo, mountaineering, weapons training, and various physical activities. 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.

* Minimum of 15 hours of laboratories required.
**Elective course work required within other disciplines such as natural sciences, social science, humanities, and foreign language for scholarship recipients.

Music (Mus)

College of Arts and Science

Professor Hatfield, head; Professors Piersel, P. Royer, Walker; Associate Professors H. Berberian, Colson, Faulmann, Johnson, Wright; Assistant Professors, Spencer, Vensand; Instructors A. Berberian, R. Royer.

It is the responsibility of the music department to culturally serve and enrich the university community. Students are served through several options offered: participation in various academic courses, participation in making music (performance) in a variety of music organizations and/or through Applied Music (private instruction in performance), and by attending the various cultural programs presented by the department throughout the year.

General Information

Several courses are offered to non-majors to stimulate the appreciation and understanding of music as a dynamic cultural force in our civilization, and/or to provide opportunities for further development of **Musical Skills** 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; Music Appreciation in Music Theatre — Mus 200; Blues, Jazz and Rock Survey — Mus 300.
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, University Chorus, Symphonic Band, Chamber Singers, Jazz Band, Symphony Orchestra, Woodwind Ensembles, String Ensembles, Brass Ensembles, Opera Theatre, Percussion Ensemble and Broadway Musical Production.**

The Music Major or Minor

Degrees offered for a major are the Bachelor of Arts in Music (B.A. — Music) or 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 **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 Music Education Program

General Studies (University Core)	37 hrs.
Music Curriculum:	
Basic Musicianship (Theory & Literature)	32 hrs.
Performance (Applied Music & Ensembles)	21 hrs.
Senior Recital	0 hrs.
Music Methods & Pedagogy	12 hrs.
Professional Education	26 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

Choral Conducting, Mus 361; Elementary & Jr. High Vocal Methods, Mus 351; Vocal Pedagogy I, II, III, IV, Mus 270-271, 370-371.

Specific Courses Required for Instrumental Emphasis

Instrumental Conducting, Mus 361; Music Education: Marching Band, Mus 362; Instrumental Pedagogy I, II, III, IV, Mus 270-271, 370-371.

Music Requirements: (All music majors)

1. Music Majors in **all** degree programs must choose an area of Applied Music (MuAp — known as the applied major) 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 gain 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 requires successful completion of an audition in the applied major area.
3. Functional piano proficiency is required of **all** majors.
4. Voice or Instrumental Proficiency is required of all Keyboard majors.
5. Foreign Language 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 that 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. Small ensembles (Chamber Singers, String ensemble, Jazz ensemble, Brass, Woodwind or Percussion Ensembles) participation is also required of all music majors. A **minimum** of three semesters is required in small ensembles (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 courses to gain stronger preparation for teaching. Further it is 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. Those enrolled in the B.M.E. program must successfully pass competency examinations in the following: Pedagogy (Instrumental: All Band instruments); conducting
9. Recommendations for enrolling in student teaching will be issued by the department head following an interview with a faculty committee of three. Each student candidate *must* arrange for this interview through the department head.
10. Senior Recitals are required of all music majors.
11. Attendance at a weekly recital/forum is mandatory each semester a student is enrolled as a full-time student. Students must enroll in Mus 195 for 0 hours credit to fulfill this requirement. Additionally, students are required to attend certain other evening concerts and recitals each semester as determined by the department.

Music Minor

Music Theory I & II	8 hrs.
Music Literature I	2 hrs.
Conducting Fundamentals	2 hrs.
Music Education II (Vocal or Instrumental Conducting)	2 hrs.
Applied (at least two hours upper level)	6 hrs.
Music Electives	2 hrs.
	22 hrs.

(In addition, minors must fulfill the Major Ensembles requirement as listed in No. 6 above, and participation in small ensembles is strongly encouraged.)

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 or 191	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*	4		4
Foreign Language	3		3
Math	3	or	3
Conducting Fund, Mus 260	2	or	2
Intermediate Musicianship III-IV, Mus 210-211	3		3
Music Literature III-IV, Mus 230-231	2		2
Applied Music	1		1
Music Organizations	1-2		1-2
	17		16

Junior Year	**F**		**S**
Junior Composition, Engl 300	3	or	3
Humanities* (or Electives)	3		
Social Science*	3		3
General Electives	2	or	2
Music Literature V, Mus 433	2	or	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* (or Electives)	3		3
Social Science*	3		3
General Electives	4		4
Music Electives	2		2
Orchestration & Arranging, Mus 420	2	or	2
Recital, Mus 493	0-2		0-2
Applied Music 400	2		2
Music Organizations (if requirement not met)	1-2		1-2
	16-18		16-18

* Must be taken in at least two areas.

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 or 191	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
	15-15		15-17

Sophomore Year	**F**		**S**
Psychology, Psyc 101 (Social Science)	3	or	3
Math	3	or	3
Natural Science*	4		4
Practicum, SeEd 287	2	or	2
Conducting Fundamentals, Mus 260	2	or	2
Intermediate Musicianship III-IV, Mus 210-211	3		3
Music Literature III-IV, Mus 230-231	2		2
Pedagogy I-II, Mus 270-271	1-2		1-2
Applied Music	1		1
Music Organizations	1-2		1-2
	17-18		17-18

Junior Year	**F**		**S**
Junior Composition, Engl 300	3	or	3
Social Science* (Indian Course) Anth 421 or Hist 368	3	or	3

Education, EdFn 339 & EPsyc 302	2	or	2
Music Education, Mus 351 or 362	2		
Music Education, Mus 361			2
Music Education, Mus 365	2	or	2
Pedagogy III-IV, Mus 370-371	1-2		1-2
Counterpoint, Mus 311	3		
Forms & Analysis, Mus 313			2-3
Music Literature V, Mus 433	2	or	2
Applied Music 300-400	2		2
Music Organizations	1-2		1-2
	16-18		16-18

Senior Year	**F**		**S**
Social Science*	3	or	3
Education, SeEd 450 (reading course)	3	or	3
Orchestration & Arranging, Mus 420	2-3	or	2-3
Applied Music (400 level)	2	or	2
Senior Recital, Mus 493	0-2	or	0-2
	13-15		13-15

Education & Teaching 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) 3(3,0) 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.

200 Music Appreciation — Music Theatre 2(2,0) FS

For the non-major. Development of the Broadway Musical, Opera and Operetta in America.

300 Blues, Jazz & Rock Survey 2(2) FS

Origins and developments of three uniquely American musics and their cultural impact upon, and within, American society. Open.

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 and Minors must enroll for Mus 111 and Mus 131 concurrently.) P, Mus 110.

195 Recital Attendance 0

Required of all music majors each semester (except B.M.E. during semester of student teaching). No prerequisite. You are required to attend a certain number of concerts/recitals each semester. Number is determined by the music faculty at the beginning of each semester and will be announced and posted in Lincoln Music Hall.

Mus 202 The Music Industry 3 F (Alternate years)

A survey of music publishing, copyright and distribution, music merchandising, music and the mass media, record industry operations, and music management. An examination of music in the marketplace and the music industry. P, consent of instructor.

210 Intermediate Theory & Musicianship III 3(3,2) F

Continuation of Mus 111. Polyphonic and contrapuntal techniques of Baroque and Classical literature — analysis, composition, dictation, sight-singing and ear-training. Introduction to principles of orchestration and arranging. (Concurrently with Mus 230) 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 literature — analysis, performance, composition and score study. Continuation of orchestration fundamentals, sight-singing, ear-training and dictation. (Concurrently with Mus 231) P, Mus 210.

311 Counterpoint (Advanced Musicianship V) 2-3(3,2) 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 and composition in small and large forms. Concentrated study of selected scores ranging through contemporary music. P, Mus 211.

420 Orchestration & Arranging (Advanced Musicianship VII) 2-3(2,2) FS

Projects in scoring for various groups, advanced study and analysis of scores. P, Mus 311 or consent.

424 Composition 2-5(3,2) FS

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.

Music Literature

130 Music Literature & History 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 a music background.

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

20th century music development in terms of two cycles: the demise of functional tonality around 1900 and the completely different but parallel set of rejections, explorations, and syntheses which followed WWII, leading to the present state of music.

435 Music Bibliography 3(3,0)

Source material for music research. Not offered every year. P, Mus 231 and Mus 433.

Music Education

260 Conducting Fundamentals

Score reading and preparation. Basic principles in conducting — rehearsal and performance. P, Mus 110 and 111. (Concurrent with Mus 210 or 211.)

351 Music Education I: Elementary Music Concepts 2(2,1) F

Materials, methods and concepts for teaching fundamentals in public schools. Includes Junior High General and Vocal Music techniques.

361 Music Education II: Conducting 2(2,1) S

Section 1: Instrumental music methods and materials. Emphasis on rehearsal techniques and conducting and study of appropriate materials.

Section 2: Choral music methods and materials. Emphasis on rehearsal techniques and conducting and study of appropriate materials.

362 Music Education III: Methods and Materials, (Instrumental) 2(2,1) F

Appropriate materials for prospective public school teachers including instrument repair and upkeep and marching band techniques.

365 Music Education IV: Supervision & Administration of School Music 2(2,1) S

Historical survey of public school music. Objectives and goals of the music program. Organization and administration of school music, contemporary concepts.

Pedagogy

270 Pedagogy I 1-2(2,1) F

Pedagogical considerations, methods and concepts in a specialized area: Section 1 — Voice; Section 2 — Strings; Section 3 — Keyboard; Section 4 — Woodwinds; Section 5 — Brass; Section 6 — Percussion; Section 7 — Theory.

271 Pedagogy II 1-2(2,1) S

Continuation of Music 270 (Pedagogy I). P, Mus 270

370 Pedagogy III 1-2(2,1) F
Continuation of Mus 271 (Pedagogy II). P, Mus 271.

371 Pedagogy IV 1-2(2,1) S
Continuation of Mus 370 (Pedagogy III). P, Mus 370.

Individual Offerings

102 Living and Study Abroad
See description in Arts and Science section.

295 Course Specials Program 5
See description in Arts and Science section.

390-490 Independent Studies 1-3
Consent. May be used as substitute for music requirement.

391-491 Directed Studies 1-3
Special projects in music for which there is no course. Projects must be approved by Music Department staff. Consent.

395 Course Specials Program 5
See description in Arts and Science.

493 Public Recital 0-2
All music majors are required to present a Senior Recital. Students may elect to enroll for Public Recital one of two ways upon consultation with their Applied instructor: a) 0 hours credit concurrent with 400 level Applied Lessons; b) 2 hours credit — concurrent with 400 level Applied Lessons — as an Honors elective. This option has the following requirements: 1) Consent of Applied instructor, 2) a research paper on the literature performed, 3) a successful recital preview and oral defense of research paper before a jury, 4) presentation of the public recital.

494 Cooperative Education/Internship/Field Experience (Topical) 3-12
See description in Arts and Science section.

Graduate Courses

590-690 Independent Studies 1-3
Consent. May be used as substitute for music requirement.

591-691 Directed Studies 1-3
Special projects in music which must be approved. Consent.

596-696 Course Specials 1-5
See description in Arts and Science section.

Applied Music (MuAp)

Individual Instruction in Voice

100-102	1(½,0) FS	**200-202**	1(½,0) FS
300-302	2(1,0) FS	**400-402**	2(1,0) FS

Class Instruction in Voice

101-103	1(½,0) FS	**201-203**	1(1,0) FS
301-303	2(2,0) FS	**401-403**	2(1,0) FS

Individual Instruction in Keyboard

110-112	1(½,0) FS	**210-212**	1(½,0) 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

Section 1 — Piano
Section 2 — Harpsichord
Section 3 — Organ

Individual Instruction in Woodwinds

120-122	1(½,0) FS	**220-222**	1(½,0) FS
320-322	2(1,0) FS	**420-422**	2(1,0) FS

Section 1 — Flute
Section 2 — Oboe
Section 3 — Bassoon
Section 4 — Clarinet
Section 5 — Saxophone

Class Instruction in Woodwinds

121-123	1(1,0) FS	**221-223**	1(1,0) FS
320	2(1,0) 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(½,0) FS	**230-232**	1(½,0) 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(½,0) FS	**240-242**	1(½,0) 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(½,0) FS	**250-252**	1(½,0) FS
350-352	2(1,0) FS	**450-452**	2(1,0) FS

Section 1 — Violin
Section 2 — Viola
Section 3 — Cello
Section 4 — Bass Viol
Section 5 — Guitar

Class Instruction in Strings

151-153	1(1,0) FS	**251-253**	1(1,0) FS
351-353	2(2,0) FS	**451-453**	2(2,0) FS

Section 1 — Violin
Section 2 — Viola
Section 3 — Cello
Section 4 — Bass Violin
Section 5 — Guitar

Accompanying (Pianists only)

181-183	1(2,0) FS	**281-283**	1(2,0) FS
381-383	2(2,0) FS	**481-483**	2(2,0) FS

All applied lessons must have instructor's consent. Class instruction consists of Master Classes at two levels — 1) Beginners; 2) Advanced.

Ensembles (MuEn)

Music Organizations are open by audition with instructor. Freshman and Sophomores must register for 100 level of large ensembles, Juniors and Seniors register for 300 level. Small ensembles; Freshman 100 level, Sophomores 200 level, Juniors 300 level, Seniors 400 level. Each course may be repeated for credit.

University Chorus			
100-300	1(0,2) FS		
Concert Choir			
101-301	1(0,5) FS		
Statesmen			
102-302	1(0,2) FS		
Civic-University Orchestra			
110-310	1(0,2) FS		
Marching Band			
120-320	1(0,5) FS		
Symphonic Band			
121-321	1(0,3) FS		
Concert Band			
122-322	1(0,2) FS		
Pep Band			
123-323	1(0,2) FS		
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, head; Professors Emeriti Erickson, Hubbs; Professors C. Peterson, E. Peterson, Johnson; Associate Professors Anderson, Gilliland, Hanson, Hofland, Holter, Moriarty, Ritter, Schroder; Assistant Professors Ayotte, Coyne, Doherty, B. Errickson, Hegge, Howe, Kropenske, Larson, McBreen, Meyer, Pettigrew, Saupe, Shroyer, Steffenson; Instructors Assam, J. Errickson, Gaspar, Henderson, Iken, Muhl, Preheim, Schroeder, Schurrer, Stanley, Wagner.

The program purposes: 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. 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, your 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 State Board Test Pool Examination 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.

The professional nursing program at SDSU is approved by the South Dakota Board of Nursing, and is 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 you in the Department of Nursing. The purpose of these organizations is to prepare you for professional activity.

Phi Chapter, Sigma Theta Tau, an honor society in nursing, was established in 1961. Membership is by election; criteria include curriculum, 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, you are taught principles of professional nursing care under the supervision of SDSU faculty. You 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 department in Brookings, Moody, Lake, Codington, Hamlin or Deuel Counties; Memorial Medical Center, Watertown; St. Ann's Hospital, Watertown; Sioux Valley Hospital, Sioux Falls; South Dakota Human Services Center, Yankton; Veterans' Administration Center, Sioux Falls; 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, you are 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 you for enrollment in the nursing course that semester.

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.

A cumulative GPA of 2.5 must be maintained for entrance into the second semester of the major courses.

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 can be repeated only once to raise an unsatisfactory grade.

You 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 your own. Professional malpractice and liability insurance will be required when enrolled in courses requiring clinical practice. This insurance is available at a group rate.

In the senior year, you are responsible for providing your own transportation one day each week for one semester when enrolled at the Brookings campus in Nurs 415, Nursing Process: The Community as Client. If you do not have a personal or a family car, a limited number of state cars are available by paying mileage at the rate set by SDSU.

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.

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.) The West River RN Upward Mobility Program is a special project established to meet the needs of registered nurses in that area. A special track for RN students is also available on the Brookings campus. For answers to specific questions, direct inquiries to the Dean, College of Nursing.

Transfer Students

Students transferring from other schools are accepted into the Department of Nursing under the general university guidelines. Those wishing to transfer into upper level nursing courses must furnish additional information as follows:

1. Three references, one of which must be from the director of the program in which you were previously enrolled.
2. A statement regarding your reasons for transferring.

These statements must be on file in the Department of Nursing prior to your acceptance into the upper level nursing major courses. They should be sent to the Dean, College of Nursing.

The following are required courses. They can be altered to meet individual needs.

Curriculum Design

Required courses are listed in the following plans. Plan A specified entry into the nursing major spring semester of the sophomore year. Plan B specified entry into the major fall semester of the junior year. These plans can be altered to meet individual needs. Other plans are available from advisors.

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 or 191*	3	or	3
Algebra, Math 111*	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			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
Abnormal Behavior, Psyc 451	3		
Pharmacology, Pha 241			3
Pathogenic Microbiology, Micr 423			4
Professional Nsg. & Hlth Care I, Nurs 202	2	or	2
Communication in Nsg, Nurs 203			3
Intro to Nsg Process, Nurs 213			4
Elective	2	or	2
	16		18

Junior Year	**F**	**S**
NP: Adults-Secondary Care, Nurs 234	4	
NP: Adults-Secondary Care, Clin, Appn, Nurs 244	4	
NP: Ind/Groups-Comm MH I, Nurs 353	2	
NP: Ind/Groups-Community MH I, Clin Appn, Nurs 355	2	
Diet Therapy Seminar, NFS 303	1	
Junior Comp, Engl 300*	3	
Elective	2	
NP: Children in Primary & Second Care, Nurs 324		3
NP: Children in Primary & Second Care, Clin Appn, Nurs 325		4
NP: Childbearing Family in Primary & Second Care, Nurs 363		3
NP: Childbearing Fam. in Prim & Sec Care, Clin Appn, Nurs 365		3
Elective		5
	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	
Public Health Science, HSc 443	3	
Intro to Research in Nsg., Nurs 473		1
Prof Nsg & Hlth Care II, Nurs 463		1
Directed Study in Nsg, Nurs 446		6
Electives		7
	17	15

Plan B

For the student who desires a slower pace.
For the student who needs to be gainfully employed.
No summer school scheduled.

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 101/191*	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*			3
	14		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*	2		7
Human Dev. & Person. III, CDFR 313			2
Prof. Nsg. & Hlth Care I, Nurs 202			2
Human Nutrition, NFS 321	3	or	3
Abnormal Behavior, Psyc 451	3	or	3
	16		17

Third Year	**F**	**S**
Pharmacology, Pha 241	3	
Communication in Nursing, Nurs 203		3
Intro to Nsg. Process, Nurs 213	4	

Junior Composition, Engl 300*	3	
Humanities*/Electives	3	
NP: Adults-Secondary Care, Nurs 234		4
NP: Adults, Clin. App., Nurs 244		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
	16	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 446	6
Elective/Humanities*	3
	15

Required pre-nursing courses: Chem 110, 111; Psyc 101; Soc 100; Micr 231; Zool 221. MAJOR: Nurs 202, 203, 213, 234, 244, 324, 325, 353, 355, 363, 365, 405, 412, 413, 415, 446, 453, 463, 473. Other required supporting courses: CDFR 211; CR 313; NFS 303, 321; Pha 241; Zool 325; HSc 443; Micr 423; Psyc 451.

General Anthropology, Anth 200 recommended as an elective. Twelve credits are allowed as electives, 6 core credits must be in humanities. Of the 18 electives, up to 6 credits may be unpenalized electives. 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 deliverative processes of research and epidemiology used in studying the external environment and the community as a client. Enrollment limited. Preference given to nursing majors.

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. Preference given to nursing majors.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, Nurs 202, 203; CDFR 211, NFS 321.

234 Nursing Process: Adults in Secondary Care Settings* 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. P or conc, Pha-241, 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.

244 Nursing Process: Adults in Secondary Care Settings — Clinical Application 4(0,12)

Clinical application of content in Nurs 234 including hospital and out-of-hospital settings. P, Nurs 203, 213, P or con, Nurs 234, Pha 241, CDFR 313, NFS 303.

353 Nursing Process: Individuals/Groups in Community MH Settings 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 in mental health settings. P, Nurs 203, 213; P or conc, Psyc 451.

355 Nursing Process: Individuals/Groups in Community MH Settings 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 Settings 3(3,0)

Pathophysiology, disturbances in normal growth and development, health care needs and problems of children-infant throughout adolescence. P, Nurse 234, 244, 353, 355. Micr 423 recommended.

325 Nursing Process: Child in Primary and Secondary Care Settings — Clinical Application 4(0,12)

Clinical application of content in Nurs 234 in hospital and out-of-hospital settings. P, Nurs 234, 244, 353, 355. P or conc, Nurs 324.

363 Nursing Process: Childbearing Family in Primary or Secondary Care Settings 3(3,0)

Normal childbearing process and related pathophysiology. Application of the deliverative nursing process with emphasis on planning and implementation based on the assessment and nursing diagnoses, working with selected communities and childbearing families. P, Nurs 234, 244, 353, 355.

365 Nursing Process: Childbearing Family in Primary or Secondary Care Settings — Clinical Application 3(0,9)

Clinical application of content in Nurs 363 including hospital and out-of-hospital settings. P, Nurs 234, 244, 353, 355. P or conc. Nurs 363.

405 Advanced Nursing Process: Individuals/Groups in Community MH Settings II 2(1,3)

Advanced nursing care of clients experiencing psychopathology. Clinical application of content in hospital and out-of-hospital setting. P, Nurs 353, 355.

412 Advanced Nursing Process: Individuals in Tertiary Care Settings 3(3,0)

Advanced pathophysiology and nursing care of clients with less well-defined medical-surgical conditions with low degree of predictability of outcome. Emphasis on crisis intervention and critical care. P, Nurs 324, 325, 363, 365.

413 Advanced Nursing Process: Individuals in Tertiary Care Settings — 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 primary care settings with application of leadership skills. P, Nurs 324, 325, 363, 365. P or conc, HSc 443.

453 Leadership in Nursing 2(2,0)

Utilization of the deliverative 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

446 Directed Study in Nursing 6(2,12)

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. P, Nurs 405, 412, 413, 415, 453. P or conc, Nurs 463, 473.

463 Professional Nursing and the Health Care System II 1(1,0)
Deliberative process applied to the study of issues and trends in nursing in preparation for professional nursing practice. P, Nurs 405, 412, 413, 415, 453.

473 Introduction to Research in Nursing 1(1,0)
Application of research process to study problems in nursing and related environmental factors. P, Nurs 405, 412, 413, 415, 453. P or conc, Nurs 463.

Optional Undergraduate Courses
(Availability of these depends on demand and availability of faculty)

200 Nursing Workshops 1-3
Special session in specific areas of nursing. Approximately 45 hours of work required for each credit, including lecture, conference, committee and group activity, and outside assignments. Workshops in nursing may range from 1 to 3 weeks. Students limited to 4 credits to apply toward degree. P, consent.

342 Communicable Disease Nursing I 2(2,0) FS
Prevention and control. P, consent.

350 Nursing in the Community 1-6
Community aspects of planning for health needs. Designed for non-credit or variable assignment of credits. May include some practice.

351 Seminar in Nursing 1(0,1-2) FS
Discussion and evaluation of the impact of nursing action in care of patients. Students limited to 4 credits to apply toward degree.

352 Communicable Disease Nursing II 2(0,6) FS
Clinical experience in meeting the nursing care needs of the patient with a communicable disease. P, consent.

360 Rehabilitation Nursing 1-6
Nursing care needs of patients with long-term illnesses. Relation of nurse to professional workers in other fields.

400 Special Problems in Nursing 1-3
Open to upper division students by permission. Students limited to 4 credits to apply toward degree. P, consent.

402 Nursing in Disaster 2(2,0)
The nurse in disaster forces. Philosophy and fundamental principles of Civil Defense. Elective for senior in nursing or registered professional nurse. Credit toward degree cannot be given for both HSc 252, Disaster Preparedness and Nursing in Disaster.

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.

494 Cooperative Education in Nursing FSSu
Opportunity to receive academic credit for work experience related to nursing. Course requirements and amount of credit granted will be determined on an individual basis. Up to four credits may apply toward graduation. P, completion of two semesters of nursing major; permission of department head.

Graduate Courses

510-610 Theory and Conceptual Frameworks in Nursing 2(2,0)
A systematic study and interpretation of nursing phenomena by critical examination of theoretical concepts and models.

520-620 Pathophysiologic Basis for Nursing Practice 2(2,0)
Manifestations of complex clinical problems analyzed through pathophysiological mechanisms with implications for nursing practice. Assumes a basic knowledge of anatomy and physiology.

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 identify and discuss issues surrounding death and ways in which health professionals may provide appropriate care for the dying person and family.

545-645 Management of Acute and Chronic Pain 2
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.

590-690 Seminar: Guided Study in Nursing 1-4(0,2)
Investigation of a selected problem in nursing theory or practice. May be repeated for two semesters for variable credit.

594-694 Research Methods in Nursing 3(3,0)
Components of the research process with emphasis on research in nursing and the health care system. Prerequisite: statistics course covering description and inferential statistics.

592-692 Special Problems 1-3(1-3,0-3) (On sufficient demand)
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) (On sufficient demand)
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 Advanced Concepts in Nursing I 3(2,3)
765 Advanced Concepts in Nursing II 4(2,6)
770 Clinical Nursing Specialization 6(3,9)
775 Nurse Role Practicum 4-12(0,12-36)
780 Advanced Seminar in Nursing 1-3(1-3,0)
782 Advanced Communication for Nursing Practice 3(2,3)
790 Thesis in Nursing 5
792 Problems in Nursing Research 2(2,0)

Nutrition and Food Science (NFS)

College of Home Economics

Professor Beattie, Acting Head; Professors Emerti Colburn, Deethardt, Guild, Wills; Associate Professor Johnson; Assistant Professor Shank; Instructors Gates, Kalvels, Miller

Majors in Nutrition, Food Science and Restaurant Management

Options available in the Nutrition and Food Science major are Dietetics (Coordinated or pre-clinical programs) and in Food Science. The Restaurant Management major has three curriculum options allowing students to choose from Bachelor of Science or Bachelor of Arts Programs.

Minors in Nutrition and Food Science

A minor in Nutrition and Food Science requires 16 semester credits of NFS-prefixed courses. All courses for the minor must be approved by the NFS Department. Students planning a minor in Nutrition and Food Science must contact the NFS Department head by the junior year.

Honors Program

The Honors program in Nutrition and Food Science meets the needs of the above average student interested in a curriculum leading to a graduate degree. Courses will be determined with the academic adviser.

Nutrition and Food Science — Dietetic Option

Dietetics offers a wide variety of jobs in hospitals, nursing homes, public health agencies, industries, schools, universities, the armed services, and state, national and international organizations.

A dietitian must have a good background in the basic sciences as well as the behavioral sciences in applying the science of nutrition to nutritional care of people, sick or well, whether in the hospital or in the community.

The dietitian is essential to the total care of the patient in a health-care facility, giving nutritional guidance and instruction that will continue on an out-patient basis. Dietitians also work in clinical research units.

The role of the dietitian is changing with changes in health care. The dietitian has become more involved in preventive health care and in community nutrition programs as an integral part of total health care.

The dietitian finds employment opportunities in types of institutions and commercial food services. The educational experiences require development of competence in application of modern management theory and the behavioral sciences to the management of food service systems.

In the future the use of the computer as a decision-making tool is an important part of the expertise of this dietitian. Dietitians with an interest in mathematics are introducing computer methods in food systems management.

Governmental regulations are requiring the services of the deititian 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:
Coordinated Undergraduate Program

SDSU's coordinated undergraduate program in dietetics (CUP) has been approved by the American Deitetic Association (ADA). This curriculum meets the requirements for an undergraduate major in general dietetics and combines clinical learning experiences with appropriate academic courses. Students completing this type of program are eligible for ADA membership, for taking the ADA registration examination, and for employment as a dietitian without completing the traditional internship.

Students interested in becoming eligible for the CUP should follow the freshman and sophomore courses sequence shown below. Selection of students for this program will be competitive. Admission to the professional phase of the program for the junior year will be based on the following criteria:

1. Grade point average of a minimum of 2.5 on a 4.0 scale.
2. Grades of at least C on all science courses.
3. Grades of at least B in NFS 141 and NFS 321.
4. Completion of required prerequisite courses (shown as freshman-sophomore sequence below).
5. Completion of a standardized interest inventory test.
6. Letter of personal reference and a personal interview with the selection committee.

	Credit		
Freshman Year	**F**		**S**
Nutrition & the Family, NFS 101	2	or	2
Family Development, CDFR 101	2	or	2
Clothing & Housing the Family, TCID 101	2	or	2
Managing Family Resources, HE 102	2	or	2
Career Exploration, HEd 101	1	or	1
Field Experience, HE 101	1	or	1
General Chemistry, Chem 112-114	4		4
Fitness and Lifetime Activities, PE 100	1		1
Foods Principles, NFS 141			4
Freshman Comp, Engl 101	3		
Intro to Sociology, Soc 100	3	or	3
Mathematics	3	or	3
Electives/Humanities	4	or	4
Sophomore Year	**F**		**S**
Human Nutrition, NFS 321			3
General Microbiology, Micr 231			4
Anatomy, Zool 221	3		
Economics I, Econ 201	3		
Elementary Organic Chemistry, Chem 120	4		
Intro to Speech, SpCm 101	3		
General Psychology, Psyc 101	3		
Educational Psychology, EPsyc 302			2
Biochemistry, Chem 260			4
Electives/Humanities			3-4
Junior Year	**F**		**S**
Physiology, Zool 325	4		
Intro to Clinical Dietetics, NFS 322	5		
Advanced Human Nutrition, NFS 422	3		
Advanced Food Science, NFS 341	4		
Food Service Purchasing, NFS 371			2
Quantity Food Production & Service, NFS 381			3
Research Problems, NFS 342			3
Organization Theory, BAd 360	3	or	3
Junior Comp, Engl 300	3	or	3
Clinical Dietetics, NFS 423			3
Special Problems, NFS 461			2
Electives/Humanities	2		
Senior Year	**F**		**S**
Institutional Organization-Management, NFS 391	3		
Professional Practicum, HE 471	9		
Special Problems, NFS 461	6		
Community Nutrition, NFS 424			4
Computer-Assisted Food Systems Management, NFS 471			3
Professional Practicum, HE 494	3		4
Seminar, NFS 403			1
Electives			5-9

Dietetics:
Preclinical Program

If you do not wish to follow the coordinate undergraduate program curriculum you may enroll in the dietetics curriculum shown below. Graduates of this four-year program meet the requirements for entry into an ADA-approved post-baccalaureate internship.

	Credit		
Freshman Year	**F**		**S**
Nutrition & the Family NFS 101	2	or	2
Family Development, CDFR 101	2	or	2
Clothing & Housing the Family, TCID 101	2	or	2
Managing Family Resources, HE 102	2	or	2
Career Exploration, HEd 101	1	or	1
Field Experience, HE 101	1	or	1
General Chemistry, Chem 110 (or Chem 112, 114)	4		
Foods Principles, NFS 141	4	or	4
Elementary Organic Chemistry, Chem 120			4
Freshman Comp, Engl 101	3		
Intro to Sociology, Soc 100			3
Fund of Speech, SpCm 101			3
Fitness and Lifetime Activities, PE 100	1		1
Mathematics electives	3	or	3
Sophomore Year	**F**		**S**
Meal Management, NFS 251	4		
Prin of Economics, Econ 201	3		
Gen Microbiology, Micr 231			4
Anatomy, Zool 221	3		
Elementary Biochemistry, Chem 260			4
Statistical Methods, Stat 341			3
General Psychology, Psyc 101	3		
Human Nutrition, NFS 321			3
Electives/Humanities	4-5		2-3
Junior Year	**F**		**S**
Intro to Dietetics, NFS 322	5		
Food Service Purchasing, NFS 371			2
Quantity Food Production & Service, NFS 381			3
Advanced Food Science, NFS 341	4		
Research Problems, NFS 342			3
Mammalian Physiol., Zool 325	4		
Organizational Theory & Management Concepts, BAd 360			3
Junior Comp, Engl 300	3		

Educational Psychology, EPsyc 302	2		
Equipment, Layout and Design, NFS 372			3
Food and Beverage Cost Control, NFS 382	3		

Senior Year	**F**		**S**
Institution Organization & Management, NFS 391	3		
Advanced Human Nutrition, NFS 422			3
Clinical Dietetics, NFS 423			3
Community Nutrition, NFS 424			4
Seminar, NFS 403	1		
Computer-Assisted Food Systems Management, NFS 471			3
Special Problems, NFS 461	4	or	4
Electives	5-6		

Suggested electives:

Human Development and Personality, CDFR 211; Management in Personal and Family Living, HE 241; Dairy Foods, DS 231; Meat: Production to Consumption AS 241; Cultural Anthropology, Anth 220; Food Microbiology, Micr 311, Principles of Accounting, Actg 210; Meal Management, NFS 251.

Food Science

The option in food science prepares you 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 curriculum tracks are provided to guide you in the technical or the promotional aspects of the food industry. Qualified students may also plan an honors curriculum in consultation with a department advisor.

Well-equipped laboratories enable you to receive practical experience while learning the principles of food science. You may also work part-time in the Nutrition and Food Science research laboratories and earn part of your university expenses.

Food Science
(Science/Technical Curriculum)

		Credit
Freshman Year	**F**	**S**
Nutrition & The Family, NFS 101	2	
Family Development, CDFR 101	2	
Clothing & Housing the Family, TCID 101	2	
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 or 191	3	
Fitness and Lifetime Activities, PE 100	1	1
Gen Chemistry, Chem 112		4
Foods: Principles, NFS 141		4
Algebra, Math 111 or 113		3
Gen Psychology, Psyc 101		3

Sophomore Year	**F**	**S**
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, HS 241		3
Fundamentals of Speech, Spcm 101		3
Intro to Sociology, Soc 100		3
Electives	3	

Junior Year	**F**	**S**
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	2-4	

Senior Year	**F**		**S**
Applied Chemical Instrumentation, Chem 330	3		
Advanced Food Science, NFS 341	3		
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	or	6
Electives	6	or	6

Suggested electives:

Elementary Physics I & II, Phys 111-113, Elementary Physical Chemistry, Chem 340; Computer Programming, CSc 311; Advanced Composition, Engl 303; Mamalian Physiology, Zool 325; Anatomy, Zool 221

Food Science
(Food Promotion/Advertising Curriculum)

		Credit
Freshman Year	**F**	**S**
Nutrition & the Family, NFS 101	2	
Family Development, CDFR 101	2	
Clothing and Housing the Family, TCID 101	2	
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 or 191	3	
Fitness and Lifetime Activities, PE 100	1	1
Gen Chemistry, Chem 110		4
Foods: Principles, NFS 141		4
Algebra, Math 111		3
Basic Photography, MCom 160		2

Sophomore Year	**F**	**S**
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, Micro 231		4
Junior Comp, Engl 300		3
Dairy Foods, DS 231		3
Gen Psychology, Psyc 101		3
Electives	2	3

Junior Year	**F**	**S**
Biochemistry, Chem 260	4	
Human Nutrition, NFS 321	3	
Principles of Advertising, MCom 370	3	
Animal Science Elective	3	
Consumer and the Market, HE 391	3	
Magazine Writing & Editing, MCom 315		3
Food Processing, NFS 351		3
Writing for Radio & TV, MCom 330		2
Publicity Methods, MCom 313		2
Statistical Methods, Stat 341		3
Dairy Science Elective		3

Senior Year	**F**	**S**
Advanced Food Science, NFS 341	3	
Advanced Exposition, Engl 303	3	
Writing in the Sciences, Engl 307	2	
Research Problems, NFS 342		3
Advanced Human Nutrition, NFS 422		3

Advertising for Print Media, MCom 371		3
Radio & TV Advertising, MCom 372		3
Experiences in Adult Education, HEd 421		2
Humanities Electives	6	
Electives	2	3

Suggested electives:

Biology, Bio 151, 153; Environmental Chemistry, Chem 380; Computer Programming, CSc 311; Institution Organization and Management, NFS 391; Community Nutrition, NFS 424; Radio and TV Production, MCom 331; Intro to Printing, Prt 112

Restaurant Management

The Department of Nutrition and Food Science offers three curricula in restaurant management. The degree may be earned in either the College of Home Economics (Bachelor of Science) or in the College of Arts and Science (Bachelor of Science, Bachelor of Arts).

The program provides a firm foundation in food preparation and food service management supported by a strong background in business and economics. In addition, most students have the opportunity to receive practicum credit for on-the-job work experience.

Students enrolled in either of the Arts and Science curricula must meet the Core requirements of that College.

Students will be prepared for careers in hotels, motels, restaurants, private clubs, airlines; or in industrial, institution or health facilities food service management.

Students with up to two years of general education credits will usually find that most of their credits will transfer into this program.

Curriculum in Home Economics, Restaurant Management Major

Leading to the Bachelor of Science degree

	Credit		
Freshman Year	**F**		**S**
Nutrition & the Family, NFS 101	2	or	2
Family Development, CDFR 101	2	or	2
Clothing & Housing the Family, TCID 101	2	or	2
Managing Family Resources, HE 102	2	or	2
Career Exploration, HEd 101	1	or	1
Field Experience, HE 101	1	or	1
Foods Principles, NFS 141	4	or	4
Intro to Hospitality Industry, NFS 171	2		
Fitness & Lifetime Activities, PE 100	1		1
Freshman Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
General Psychology			4
Natural Science	4	or	4
Sophomore Year	**F**		**S**
Natural Science	4		4
Food Service Purchasing, NFS 371			2
Quantity Food Production, NFS 381			3
Meat, Production to Consumption, AS 241	3		
Dairy Foods, DS 231	3		
Prin of Economics I, Econ 201	3		
Prin of Economics II, Econ 202			3
Prin of Accounting I, Actg 210	3		
Prin of Accounting II, Actg 211			3
Electives/Humanities			3
Junior Year	**F**		**S**
Equipment, Layout and Design, NFS 372			3
Mechanical Equipment in Bldgs, ME 381	3		
Business Law, BAd 350	3		
Survey of Nutrition, NFS 221			3
Prin of Advertising, MCom 370	3		
Jr Comp, Engl 300			3
Advanced Food Science, NFS 341	4		
Food and Beverage Cost Control, NFS 382			3
Electives/Humanities	3		4
Senior Year	**F**		**S**
Institution Organization, Management, NFS 391	3		
Computer-Assisted Food Service Management, NFS 471			3
Professional Practicum in Food Service	0-12		
Research Problems in Food Service, NFS 342			3
Hospitality Industry Law, NFS 362			2
Food Service Operational Mgt., NFS 481			3
Special Topics, NFS 461	0-4		0-4
Electives/Humanities	0-16		3-7

Curriculum in Arts and Science Restaurant Management Major

Leading to the Bachelor of Science degree

	Credit		
Freshman Year	**F**		**S**
Foods Principles, NFS 141	3		
Intro to Hospitality Industry, NFS 171	2		
Freshman Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
General Psychology, Psyc 101	3	or	3
Intro to Sociology, Soc 100	3	or	3
Algebra, Math 111	3	or	3
Sophomore Year	**F**		**S**
Prin of Econ I, Econ 201	3		
Prin of Econ II, Econ 202			3
Prin of Accounting I, Actg 210	3		
Prin of Accounting II, Actg 211			3
Food Service Purchasing, NFS 371			2
Quantity Food Production, NFS 381			3
Natural Science	4	or	4
Meat, Production to Consumption, AS 241	3	or	3
Electives/Humanities	3-7		1-5
Junior Year	**F**		**S**
Organization Theory & Management Concepts, BAd 360	3		
Institutional Organization & Management, NFS 391			3
Money and Banking, Econ 330	3		
Marketing, Econ 353			3
Jr Comp, Engl 300	3	or	3
Statistical Methods, Stat 341	3	or	3
Dairy Foods, DS 231	3		
Business Law, BAd 350	3		
Hospitality Industry Law, NFS 361			2
Food and Beverage Cost Control, NFS 382	3		
Equipment, Layout & Design, NFS 372			3
Electives/Humanities	1		3
Senior Year	**F**		**S**
Computer-Assisted Food Service Management, NFS 471			3
Labor, Law & Economics, Econ 382	2		
Risk Management, Econ 453	3		
Business Law, BAd 350			3
Prin of Advertising, MCom 370	3		
Mechanical Equipment in Bldgs, ME 381			3
Food Service Operational Management, NFS 481			3
Professional Practicum, NFS 494	0-12	or	0-12
Electives			

Curriculum in Arts & Sciences, Restaurant Management Major

Leading to the Bachelor of Arts degree

This curriculum is especially appropriate for students considering foreign employment opportunities in the hospitality industries.

	Credit		
Freshman Year	**F**		**S**
Foods Principles, NFS 141	4		
Intro to Hospitality Industry, NFS 171	2		
Freshman Comp, Engl 101 or 191	3	or	3
Fund of Speech, SpCm 101	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
General Psychology, Psyc 101	3	or	3
Intro to Sociology, Soc 100	3	or	3
Algebra, Math 111	3	or	3
Humanities or Foreign Language			
Sophomore Year	**F**		**S**
Prin of Econ I, Econ 201	3		
Prin of Econ II, Econ 202			3
Prin of Accounting I, Actg 210	3		
Prin of Accounting II, Actg 211			3
Food Service Purchasing, NFS 371	2		
Quantity Food Production, NFS 381			3
Natural Science	4	or	4
Meat, Production to Consumption, AS 241	3	or	3
Electives or Humanities	3-7		1-5
Junior Year	**F**		**S**
Institutional Organization & Management, NFS 391	3		
Money and Banking, Econ 330	3		
Jr Comp, Engl 300	3	or	3
Statistical Methods, Stat 341	3	or	3
Dairy Foods, DS 231	3		
Hospitality Industry Law, NFS 361			2
Food and Beverage Cost Control, NFS 382	3		
Equipment, Layout & Design, NFS 372			3
Electives/Humanities	4		4
Senior Year	**F**		**S**
Computer-Assisted Food Service Management, NFS 471			3
Labor, Law, & Economics, Econ 382	3		
Risk Management, Econ 453	3		
Business Law, BAd 350			3
Prin of Advertising, MCom 370	3		
Mechanical Equipment in Bldgs, ME 381			3
Food Service Operational Mgm't., NFS 481			3
Professional Practicum, NFS 494	0-12	or	0-12
Electives			

Undergraduate Courses
Nutrition and Food Science (NFS)

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
Selection and preparation of meats, batters, and doughs. Planning, purchasing, preparing and serving food. Case study involving economic problems 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.

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.

322 Introduction to Dietetics 5(3,6) 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, consent of department.

341 Advanced Food Science 3(1-6) 4(2,6) F
Food preparation from chemical and physical standpoint. P, 141.

342 Research Problems in Nutrition, Food Science & Food Systems 3(1,6) S
Investigation of problems in nutrition, food science and/or food systems management with results submitted as a technical paper. P, 341.

351 Principles of Food Processing 3(2,3) S
Study of the physical/chemical principles and approaches used in heat processing, freezing, dehydration, and fermentation of foods. Current processing methods will be considered in terms of preparation, processing, packaging, and quality control of food products. P, Chem 110 or 114, NFS 151, or consent.

361 Hospitality Industry Law 2(2,0) S
This course presents common and civil law as it relates to the operation of various hospitality industry enterprises. Preventative law is presented to permit managers to be aware of potential legal pitfalls and steps required to minimize legal problems. P, Business Law (BAd 350) alternate years.

371 Food Service Purchasing 2(1,3) S
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 alternate years.

391 Institution Organization & Management 3(2,3) F
Study and experience in managing food service facilities, work on personnel policies including position descriptions, job analysis, employee training, kitchen layout. 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 or consent.

423 Clinical Nutrition 3(3,0) S
Role of nutritional intervention in pathological conditions. P, 422.

424 Community Nutrition & Consulting Dietetics 4(2,6) 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.

461 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.

471 Computer-assisted Food Service Management 3(2,3) S
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 Center. P, 381, consent. Alternate years.

494 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

561-661 Special Problem in Food & Nutrition 1-3
Special study in food and nutrition. P, consent.

724 Recent Developments & New Approaches in Human Nutrition 3(3,0)

734 Techniques in Nutrition Research 3(1,6)

743 Current Topics in Foods 3(3,0)

Pharmacy (Pha)

College of Pharmacy

Professor Hopponen; Professor Emeriti Eidsmoe, Gross, LeBlanc; Associate Professor Billow; Assistant Professors Cascella, Edwards, Larson, Moss, Scherrer, Van Riper; Instructor, Joens

See page 49 for Pharmacy curriculum.

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.

211 Pharmacy I 4(3,3) S
Theory, preparation, and application of pharmaceutical solution dosage forms. Introduction to drug literature. P, 2nd-year standing in pharmacy, Chem 120.

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.

312 Pharmacy II 4(3,3) F
Theory, preparation, and application of pharmaceutical solid, plastic, and polyphasic dosage forms. P, 3rd-year standing.

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) S
State and federal laws and regulations. P, 3rd year standing.

401 Current Topics in Pharmacy 1(1,0) S
Films and discussions on topics of interest not included in more formalized courses. Grading on satisfactory-unsatisfactory basis. P, 4th or 5th year standing.

411 Biopharmaceutics and Pharmacokinetics 4(3,3) S
Physio-chemical relationships of pharmaceutical dosage forms and their practical application. Introduction to biopharmaceutics and pharmaco kinetics and dosage form adjustment. P, Pha 312.

412 Prescription Practice 5(3,4) S
Pharmacist's professional role in dispensing medications. P, 4th year standing, Pha 422, 541.

440 Advanced Pharmacokinetics 2(2,0) F
Theory and application of compartmental models for the study of the time course of drugs in the body. P, Pha 411.

455 Pharmaceutical Research 1-3(0,3 per credit)
Undergraduate students of superior ability may elect research problems in any of the following areas: biopharmaceutics, manufacturing pharmacy, dispensing pharmacy, new products development, improvement of existing products, stabilization and preservation of medicinal items. Graded on satisfactory-unsatisfactory basis. P, consent.

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 or institutional pharmacy. Eight 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.

552 Pharmacy Management 3(3,0) FS
Economic and professional considerations in management of a community pharmacy. P, 5th year standing.

554 Hospital Pharmacy 3(2,1) FS
Drug Distribution and control in hospitals. Emphasis on I.V. Admixtures. P, 5th year standing.

Pharmaceutical Chemistry (Pha)

College of Pharmacy

Professor Omodt

Undergraduate Courses

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, Chem 112. 2nd-year standing.

321 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.

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.

421 Organic Medicinals 4(4,0) S
Nomenclature and properties of organic compounds as they relate to pharmacy and medicine. Structure-activity relationships, incompatibilities, uses and doses. P, 3rd year standing. Pha 321, 323.

422 Organic Medicinals 4(4,0) F
Continuation of 421. P, 421, 4th year standing.

455 Pharmaceutical Research 1-3(0,3 per credit)
Undergraduate students of superior ability may elect research problems from one of the following areas: pharmaceutical analysis, organic medicinal chemistry or pharmaceutical biochemistry. Grading on satisfactory-unsatisfactory basis. P, consent of instructor.

Pharmacognosy (Pha)

College of Pharmacy

Associate Professor Chappell

Undergraduate Courses

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(3,2) S
Continuation of 331. P, 331.

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)
Undergraduate students of superior ability may elect a research problem on the isolation, analysis or biological activity of drugs from plant and animal sources. Grading on a satisfactory-unsatisfactory basis. P, consent.

Pharmacology (Pha)

College of Pharmacy

Professor Hietbrink; Assistant Professor Houglum

Undergraduate Courses

241 Pharmacology 3(3,0) FS
Basics of pharmacology and therapeutics for nurses and others. P, Chem 111, current enrollment in Zool 325.

455 Pharmaceutical Research 1-3(0,3 per credit)
Undergraduate students of superior ability may elect a research problem in pharmacology or toxicology. Grading on satisfactory-unsatisfactory basis. P, Pha 541.

541 Pharmacology 5(4,3) F
Basic principles of pharmacology and therapeutics. Laboratory illustration (student participation) of drug action. P, 4 th year standing.

542 Pharmacology 5(4,0) S
Continuation of 541, P, 541.

543 Toxicology 2(2,0) S
Toxicology and medicolegal aspects of poisonings. Common poisons with emphasis on antidotal measures. P, 4th year standing.

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, 545.

Philosophy and Religion (Phil-Rel)

College of Arts and Science

Associate Professor Norlin, head; Associate Professor Fee; Assistant Professors Kedl, Nelson

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 humanize 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.

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 reasoning leading to thoughtfulness in your academic and personal life.

312 Great Ideas of the Western World 4
Begins on the assumption that ideas have been profound instruments of change and development in human culture. Explores some of the fundamental ideas which have shaped western civilization and how much our contemporary world is a product, not simply of war, plague and commerce, but also of the way humanity has understood the world.

331 Philosophy of Science 3(3,0) FS
Analysis of nature and goals of scientific knowledge and logical structure of physical, biological, and social sciences in terms of natural law, scientific theories, and explanations.

395 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.)

494 Cooperative Education/Internship/Field Experience (Topical) See general description in College of Arts and Science Alternatives and Options.

496 Undergraduate Course Specials
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 2(2,0) F
Old Testament and Intertestamental literature and its relevance for today.

227 New Testament 2(2,0) 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.

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.

393 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 Cooperative Education/Internship/Field Experience (Topical)
See general description in College of Arts and Science Alternatives and Options.

Physics (Phys)

College of Engineering

Professor Tunheim, Head; Professors Duffey, Graetzer, Miller, Parker, Professor Emeritus Williams; Associate Professors Hein, Leisure; Assistant Professors Jackson, Lynch, Sippel

Two main objectives are considered in the organization of course work in this department. First, that the basic courses meet the needs of students in the various colleges of the university who need basic physics. Second, the sequence of advanced courses makes it possible to follow one of two curricula which specialize in the engineering and science of physics. The department is well supplied with laboratory and lecture-demonstration equipment and other facilities in support of these objectives.

The curriculum in Engineering Physics, administered in the College of Engineering, is built around a strong core of physics courses supported by allied courses from engineering departments. It is designed to give the ability to apply new research developments to pressing problems of society. Students interested in industrial employment should consider this program. Electives can be chosen to emphasize either electrical or mechanical aspects. Two major areas of employment are applied nuclear physics and solid state. A graduate with this background may enter employment immediately as an Engineer or continue graduate work in physics or another field such as Nuclear Engineering, Electrical Engineering, or Mechanical Engineering.

The other curriculum leads to a B.S. degree with a physics major in the College of Arts and Science. The program is so arranged that with proper choice of electives a student may emphasize training for one of several careers. One elective area leads to a strong physics major suitable for planning toward graduate work and eventually a position in research or university teaching.

A second elective area includes all professional education courses that are required to enter secondary teaching. If you choose this type leaves room for 38 hours of electives, giving maximum flexibility. For instance, a student pursuing meteorology as a career should choose elective courses in climatology, geography, and computer science.

A student pursuing a career in medical physics should choose elective courses in physiology, anatomy, microbiology and electronics. A more complete listing of elective courses for various technical careers is available in the Physics Department office.

To be eligible for graduation in either physics major, you must have a "C" average or above for all physics courses. An average of "C" or above must also be obtained for the three courses; Physics 211-213 (or Physics 111-113) and Physics 331. Any deviations from departmental requirements must be approved by the Department Head of Physics.

Curriculum in Engineering Physics

128 Semester Credits Required for the Bachelor of Science degree

	Credit	
Freshman Year	**F**	**S**
Mathematical Analysis I-II, Math 123-224	5	4
General Chemistry, Chem 110 and 112, or 114 and 120	4	3
Fr Comp, Engl 101 or 191 & Fund of Speech, SpCm 101	3	3
Engineering Design Graphics I, EG 121	2	
Engineering Design Graphics II, EG 122		2
General Physics I, Phys 211		4
Fitness & Lifetime Activities, PE 100	1	1
Orientation for Engineers, GE 110	0	
Sophomore Year	**F**	**S**
Mathematical Analysis III, Math 225	3	
General Physics II, Phys 213	4	
Differential Equations, Math 321		3
Engineering Mechanics, EM 223	3	
Introduction to Literature, Engl 218		3
Atomic Physics, Phys 331		3
Principles of Economics I, Econ 201	3	
Electric Circuits I, EE 215		3
Metal Processing, ES 225 or 235		1
*Non-technical electives	3	
†Technical electives		3
Junior Year	**F**	**S**
Classical Theoretical Physics, Phys 351	3	
Optics, Phys 361		3
Advanced Laboratory I-II, Phys 312-314	1	1
Thermodynamics & Statistical Mechanics, Phys 341	3	
Modern Theoretical Physics, Phys 371		3
Computer Programming, CSc 312		2
Advanced Engineering Mathematics, Math 331		3
Junior Composition, Engl 300 or Adv Exposition, Engl 303	3	
*Non-technical electives	2	2
†Technical electives		3
Physics Colloquium, Physc 497	1	1
Senior Year	**F or S**	
Introductory Nuclear Physics, Phys 433	3	
Theory of Electricity, Phys 421	3	
Advanced Laboratory III-IV, Phys 412-414	2	
Electronics I, Elec 320	3	
Electronics Lab I, Elec 322 or Electrical Instruments, EE 317		1
Electronics II, Elec 321	3	
Physics of the Solid State, Phys 439	3	
†Technical electives	9	
*Non-technical electives	3	
Free electives	3	

*Non-technical electives are provided to strengthen cultural growth and education in the humanistic and social science areas. At least 12 credits must be selected from the representative list shown on pages 11-13 and should be logical and purposeful selections having the approval of the Physics Department chairman and must meet university requirements.

†Technical elective program will be planned and coordinated according to the interest and aptitude of the student. Technical electives must be approved by the Department chairman if not listed below.

Suggested Technical Electives

Statistics, EM 221 and Dynamics, EM 222, may be substituted for Engineering Mechanics, EM 223; Fluid Mechanics, EM 331; Physical Climatology & Meteorology, AgE 353; Metallurgy, ME 341; Heat Transfer, ME 415; Engineering Analysis, ME 351; Electrical Materials I, EE 265; Basic Electrical Engineering I, EE 305; Electronics III, Elec 420; Electromagnetic Field Theory, EE 385; Electronics Lab, Elec 322; Lines, Antennas, and Waveguides, EE 386; Digital Systems, EE 445; Electrical Materials II, EE 465; Modern Algebra, Math 313; Linear Algebra, Math 315; Mathematical Statistics, Math 381; Laplace Transform, Math 433; Complex Variables, Math 521; Advanced Calculus I-II, Math 523-524; Vector Analysis, Math 527; Partial Differential Equations, Math 531; Introduction to Numerical Computation, Math 373; Theory of Probability, Math 583; Atomic and Molecular Spectra, Phys 437; Special Projects, Phys 495; Plasma Physics, Phys 525; Reactor Physics, Phys 535; Science of Solids, Phys 537-637; Physical Chemistry, Chem 342 and 344; Inorganic Chemistry, Chem 452; Instrumental Analysis, Chem 434; Biology 200 level or

higher courses; all Computer Science courses of number higher than 312.

Credit in Phys 494, Cooperative Education/Internship/Field Experience particularly encouraged for those interested in industrial employment as a technical elective.

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, 191 or Speech SpCm 101	3	or	3
Algebra & Trigonometry, Math 113	5		
Mathematical Analysis I, Math 113			5
Fitness & Lifetime Activities, PE 100	1		1
General Chemistry, Chem 110 and 112 or 114 and 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
Computer Programming, CSc 312	2	
History of Technology, GE 231		2
Electives	6	7

Junior Year	**F**	**or**	**S**
Atomic Physics, Phys 331	3		
Junior Composition, Engl 300	3		
Optics, Phys 361	3		
Advanced Lab II, Phys 314	1		
Physics Colloquium, Phys 497	2		
Electives	20		

Senior Year	**F**	**or**	**S**
Philosophy of Science, Phil 435	2		
Electives	30		

Elective Areas of Study

I. Professional Physics
- Classical Theoretical Physics Phys 351 3
- Modern Theoretical Physics, Phys 371 3
- Advanced Laboratory I, Phys 312 1
- Thermodynamics, Phys 341 3
- Physics of the Solid State, Phys 439 3
- Introductory Nuclear Physics, Phys 433 3
- Advanced Laboratory III-IV, Phys 412-414 2
- Theory of Electricity, Phys 421 3
- Differential Equations, Math 321 3
- Social Science electives from approved list 12
- Humanities electives from approved list 8
- Additional electives 21

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 5
- Chemistry or Biology Electives 6
- Descriptive Astronomy, Phys 103 3
- Social Science electives from approved list (total) 12
- Humanities electives from approved list (total) 8
- Differential Equations, Math 321 3

III. **General Physics**
- Physics electives 8
- Social Sciences electives from approved list (total) 12
- Humanities electives from approved list (total) 8
- Additional electives 38

Curriculum in Arts and Sciences Physics Minor

The physics minor consists of a minimum of 17 credit hours of physics. Eleven of these must consist of Elementary Physics 111 and 113 or General Physics 211 and 213 together with Atomic Physics 331. The six remaining credit hours can be chosen from all remaining courses in the Physics Department except Physics 101.

Undergraduate Courses

101 Introductory Physics 4(3,2) FS
One-semester course. Concepts, vocabulary and methods of the science. P, high school algebra. (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. P, plane trigonometry.

111 Elementary Physics I 4(3,2) FS
First semester of a year course, primarily for students in the biological, agricultural, and health sciences. Mechanics, heat, wave motion. P, Math 111. (Credit will not be allowed in both 111-113 and 211-213)

113 Elementary Physics II 4(3,2) FS
Continuation of 111. Electricity, light, atomic and nuclear physics. P, 111.

211 General Physics I 4(3,2) FS
For students in physical science and engineering, Mechanics and Thermodynamics. P, concurrent registration in Math 224. (Credit will not be allowed in both 111-113 and 211-213.)

213 General Physics II 4(3,2) FS
Continuation of 211. Electricity, waves, and optics. P, 211.

312 Advanced Laboratory I 1(0,3) S
Selected experiments from various branches of physics. Emphasis on precision and analysis of experimental error. P, junior standing in physics.

314 Advanced Laboratory II 1(0,3) F
Selected experiments, primarily in optics.

326 Electrical Measurements 1(0,3)
DC and AC bridge measurements of resistance, inductance, and capacitance. Display and measurements of transients and magnetic effects. P, 213.

331 Atomic Physics 3(3,0) FS
Atomic and nuclear structure with emphasis on impact of 20th century developments on science and engineering. P, 213 or 113 and consent.

341 Thermodynamics & Statistical Mechanics 3(3,0) S
Thermodynamic systems from macroscopic approach considering first and second laws of thermodynamics and their consequences, and from microscopic approach via kinetic theory of gases and statistical mechanics. P, 213 or 113 and Math 225.

351 Classical Theoretical Physics 3(3,0) F
Vectors, dyadics, tensors, matrices, spinors, symmetry arguments. Newtonian, Lagrangian, Hamiltonian mechanics. Galilean and Einstein relativities. P, EM 223.

361 Optics 3(3,0) F
Intermediate course in geometrical and physical optics with principal emphasis on physical optics. Analysis of refraction phenomena, thick lenses, wave nature of light, interference, diffraction, and polarization. P, 213 or 113 with consent.

371 Modern Theoretical Physics 3(3,0) F
Nature of space, time and particles. Quantization of translatory motion, rotatory motion, vibratory motion, motion in a Coulombic field. Operators, wave packets, potentials, forces. P, 331 or consent.

412 Advanced Lab III 1(0,3)
Selected experiments in modern physics: gamma ray spectroscopy, half life, beta decay, positron annihilation, neutron capture, bubble chamber events, nuclear statistics, etc.

414 Advanced Lab IV 1(0,3)
Continuation of 412 into individualized projects. Also, experiments in solid state physics, such as electron spin resonance and diamagnetism.

421 Theory of Electricity 3(3,0) S
Principles of electricity and magnetism, with applications to dielectric and magnetic materials. Development of Maxwell's equations, and applications. P, 213.

433 Introductory Nuclear Physics 3(3,0)
Radioactivity, nuclear spectra and structure, particle accelerators, fission and fusion, radiation safety, high energy particles.

437 Atomic & Molecular Spectra 3(3,0) S
Atomic and molecular structure in terms of vector model and quantum mechanics. P, concurrent registration in 371.

439 Physics of the Solid State 3(3,0) F
Electronic processes with reference to electrical properties of metals, semiconductors and insulators. P, 331, Math 321.

494 Cooperative Education/Internship/Field Experience 1-6 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.

495 Special Topics 1-3 FS
Special problems. P, consent.

497 Physics Colloquium 1(1,0) FS
Recent developments in the field of physics, and topics of related interest. Participation required for physics majors for any 2 semesters during the junior or senior year.

Graduate Courses

521-621 Electrodynamics 3(3,0) S
Complex quantities, circuits, Maxwell's equations, waves in general, planar, cylindrical, and spherical waves, approximation methods, plasmas. P, 421.

525-625 Plasma Physics 3(3,0) S
Elementary processes in a plasma, trajectories of charged particles, collective effects, creation of plasma, plasma instabilities, applications. P, 421.

535-635 Reactor Physics 3(3,0) S
Fission process: moderation and diffusion of neutrons, critical equation, reactor control, environmental effects, and nuclear fusion reaction.P, 331.

537-637 Science of Solids 3(3,0)
Topics covered to satisfy student interests in areas such as magnetism, semi-conductors, superconductors, ferroelectrics, and devices based on these aspects of solids. The role of defects in solids and strength of materials may also be included. P, 331, and 439 or consent.

571-671 Quantum Mechanics 3(3,0)
Hermitian operators, matrix methods, perturbation theory, Dirac wave equation, four-fermion interactions. P, 351, 371.

575-675 Tensors & General Relativity 3(3,0)
Covariance in physics, basic tensor algebra and calculus, affine connections, the Riemann tensor, field equations, linear approximations, the Schwarzchild solution. P, 351.

595-695 Special Topics 1-3 FS
Individualized special projects. P, consent.

743 Statistical Mechanics 2(2,0)
751 Theoretical Mechanics 3(3,0) F
779 Group Theory in Quantum Mechanics 3(3,0)
790 Thesis 5-7

Planning (Plan)

Professor Hogan, chairman and coordinator; Coordinating Committee: Professors Carl, Gilbert; Associate Professors Burns, Edeburn, Nordstrom, Wagner; Assistant Professor Samuelson

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
Purpose, structure, and dynamics of the planning process. Identification of different types of planning. Interdependencies among persons who contribute to the planning process and are trained in separate academic disciplines. Basic techniques employed within different phases of the planning process. P, Enrollment within a minor in planning at the Master's level or consent.

592-692 Techniques of State, Regional and Community Planning 3(3,0) S
Brief review of basic approaches, procedures and methods employed within different phases of the planning process. Coordination required among persons trained in separate academic disciplines in order to carry out these basic techniques. Exercises in the practical application of selected techniques and review of their applications in on-going to completed planning efforts. P, Plan 691.

(See also specialized courses in planning within departmental listings in Economics, Education, Engineering, Geography, Horticulture-Forestry, Political Science and Sociology.)

Plant Science (PS)

College of Agriculture and Biological Sciences

Professor Horton, head; Professors Arnold, Berndt, Brage, Buchenau, P. Carson, Fine, Gardner, Kantack, Kenefick, McDaniel, Moore, Reeves, Shubeck, Walgenbach, Walstrom, Wells, White, Wood; Professors Emeriti Kinch, Semeniuk, Shank; Associate Professors Cholick, Evenson, Kohl, Lay, Lunden, Malo, Smolik, Wrage; Assistant Professors Boe, Bonnemann, Carlson, M. Carson, Easton, Erion, Ferguson, Fixen, Geise, Kingsley, Lemme, Pollmann, Stymiest, Vigil, Weeldreyer, Wicks; Instructor Gerwing.

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: (Veterinary Science) Evenson, D. (Northern Grain Insect Research Laboratory — USDA, SEA/AR) Baumbach Branson, Dybing, Fisher, Gustin, Kahler, Kieckhefer, Kirk, Krysan, Price, Sutter. (Remote Sensing Institute) Westin. (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 six possible majors: (1) Agronomy (business or irrigation options), (2) Crop Science, (3) Entomology, (4) Pest Management (animal or plant science options), (5) Plant Pathology, and (6) Soil Science (irrigation option).

The choice of a major 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 advisors, 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. Departmental club activities offer 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 companies 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

	Credit		
Freshman Year	**F**		**S**
Crop Production, PS 103	3		
Intro Biology, Bio 151	3		
Botany, Bot 200			3
Algebra, Math 111 or 113	3-5		
Fr Comp, Engl 101 or 191			3
General Chemistry, Chem 110, or 112 and 114	4		0-4
Soils, PS 113			3
Fitness & Lifetime Activities, PE 100	1		1
Unrestricted Electives	0-2		6-2
	16		16
Sophomore Year	**F**		**S**
Weed Control, PS 343	3		
Intro to Sociology, Soc 100	3		
Principles of Plant Pathology I, PS 223	3		
Macroeconomics Principles, Econ 201			3
Fund of Speech, SpCm 101	3	or	3
Elementary Organic Chemistry, Chem 120	4		
General Microbiology, Micr 231			4
Crop and Livestock Insects, Ent 293			3
Unrestricted Electives	3		3
	16		16
Junior Year	**F**		**S**
Forage Crops & Pasture Management, PS 313	3		
Conservation & Management of Soils, PS 372 (1984)	2		
Soil Fertility & Fertilizers, PS 323			3
Seed & Grain Technology, PS 303 (1983) or Grain & Seed Production & Processing, PS 312 (1984)			2-3
Geology, PS 243			3
Genetics, Bio 371†	3		
Animal Nutrition, AS 223	3		
Physics, Phys 101 or 111 & 113	4		0-4
Junior Comp, Engl 300			3
Unrestricted Electives	1		1-4
	16		16
Senior Year	**F**		**S**
Undergraduate Seminar, PS 491		1	1
Plant Physiology, Bot 427	4		
Statistical Methods I, Stat 341	3		
Advanced Exposition, Engl 303			2
American/State & Local Government, PolS 100 or 210			3
Humanities Electives*	3		3
Social Science Elective**			3
Unrestricted Electives	5		4
	16		16

MINOR: PS 103, 113, 223, 491, plus 6 additional credits of Plant Science courses.

† Not required for business option.
* Humanities electives to be selected from the approved humanities listing.
**Social science electives to be selected from the approved social science listing.

Business Option*: Students interested in the business phases of agriculture, i.e., administration, farming, ranching, sales, public relations etc., may elect a business option in agronomy. Students selecting this option would complete the following courses as agronomy electives:

Principles of Econ II, Econ 202	3
Principles of Accounting, Actg 210	3
Organizational Theory and Business Management Concepts, BAd 360	3
Business electives**	12

* Genetics, Bio 371, is not required but is a recommended elective.
**The business electives must be chosen from the following courses: Principles of Accounting II, Actg 211; Personal Finance, BAd 280; Business Finance, BAd 310; Business Law I, BAd 350; Business Law II, BAd 351; Money and Banking, Econ 330; Marketing, Econ 353; Marketing Management, Econ 452; Statistical Methods, Stat 341 or equivalent.

Irrigation Option: A student wishing to complete the irrigation option with an agronomy major will need to take the following: AE 353; Chem 112, 114; MA 333; PS 352, 483. The courses AS 223 and Bio 371 need not be taken. Phys 111, 113 are recommended in the sophomore year.

Crop Science Major

Offered for students interested in advanced study of the more scientific aspects of crop production. Recommended for students desiring employment in technical positions after obtaining the Bachelor of Science degree and for students undertaking graduate study in Plant Science or a related field.

Curriculum in Agriculture, Crop Science Major

Leading to the Bachelor of Science degree

	Credit		
Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
General Chemistry, Chem 112 & 114	4		4
Algebra & Trigonometry, Math 113			5
Intro Biology, Bio 151-153	3		3
Botany, Bot 200			3
Crop Production, PS 103			3
Intro to Sociology, Soc 100			3
Unrestricted Electives	2		
	16		16
Sophomore Year	**F**		**S**
Principles of Plant Pathology I, PS 223	3		
Elementary Organic Chemistry, Chem 120	4		
Macroeconomics Principles Econ 201			3
Crop & Livestock Insects, Ent 293			3
Genetics, Bio 371 & 372	4		
Statistical Methods I, Stat 341			3
Mathematical Analysis I-II, Math 123 & 224	5		4
Soils, PS 113			3
	16		16
Junior Year	**F**		**S**
Fund of Speech, SpCm 101	3		
Jr Comp, Engl 300			3
General Microbiology, Micr 231			4
Computer Programming, CSc 212, 311 or 312			1-3
Physics, Phys 101 or 111 & 113	4		0-4
Seed & Grain Technology, PS 303 (1983) or Grain & Seed Production & Processing, PS 312 (1984)			3-2
Animal Nutrition, AS 223	3		
Plant Breeding, PS 443 (1983)	3		
Restricted Electives*	3		0-3
Unrestricted Electives			0-2
	16		16

Senior Year	F	S
Forage Crops & Pasture Management, PS 313	3	
American or State & Local Government, PolS 100 or 210		3
Advanced Exposition, Engl 303		2
Restricted Electives*	3	
Plant Physiology, Bot 427	4	
Undergraduate Seminar, PS 491	1	1
Humanities Electives**	2	4
Social Science Elective†		3
Unrestricted Electives	3	3
	16	16

* Restricted electives must include at least one additional course in Chemistry and 6 credits of Plant Science courses.
**Humanities electives to be selected from the approved humanities listing.
† Social science elective to be selected from the approved social science listing.

Entomology Major (Ent)

(College of Agriculture and Biological Sciences)

Offered for students interested in the study of insects as a basic science or with application to insect control and management procedures. Courses are designed to explore the fundamentals of entomology and to develop control or management procedures which integrate biological and chemical methods.

Curriculum in Agriculture, Entomology Major

Leading to the Bachelor of Science degree

	Credit	
Freshman Year	**F**	**S**
Fr Comp, Engl 101 or 191	3	
Fitness & Lifetime Activities, PE 100	1	1
Biology, Bio 151	3	
Gen Chem, Chem 112, 114	4	4
Crop Production, PS 103	3	
Intro to Entomology, Ent 105		3
Algebra & Trigonometry, Math 113		5
Animal Kingdom, Zool 203		3
Household Pest Control, Ent 191	2	
	16	16

Sophomore Year	F	S
Field Application & Regulation of Pesticides, Ent 253		3
Intro to Sociology, Soc 100		3
Soils, PS 113	3	
Intro Physics, Phys 101 or Elementary Physics I, Phys 111		4
Crop & Livestock Insects, Ent 293		3
Elementary Organic Chem, Chem 120	4	
Plant Kingdom, Bot 201	3	
Macroeconomics Principles, Econ 201	3	
Fund of Speech, SpCm 101		3
Prin of Plant Pathology, PS 223	3	
	16	16

Junior Year	F	S
Medical Entomology, Ent 393	3	
Computer Programming, Data Processing, CSc 271		4
Elementary Biochemistry, Chem 260	4	
Junior Comp, Engl 300		3
American, or State & Local Gov't, PolS 100 or 210		3
Publicity Methods, MCom 313		2
Gen Microbiology, Micr 231	4	
Prin of Ecology, Bio 211	3	
Horticultural Insects, Ent 295	3	
Intro to Animal Science, AS 101		3
Zoological Literature, Zool 295		1
	17	16

Senior Year	F	S
Genetics, Bio 371	3	
Statistical Methods I, Stat 341	3	
Humanities electives	3	3
Invertebrate Zoology, Zool 357		4
Insect Control Methods, Ent 391	3	
Electives	4	8
	16	15

Major: As listed in curriculum
Minor: Must include Ent 105; Ent 293; Bio 371 and sufficient department approved entomology courses to total a minimum of 18 semester credits.

Students who expect to continue the study of entomology on the graduate level should consider including among their electives, at least a year of French or German. Additional mathematics and statistics are also recommended.

Students who expect to teach in secondary schools should include such courses in the Department of Education as are required for teaching certification.

These curricula are designed to fit the needs of most students. Where preparation for a special field is desired, substitutions may be made with the approval of the departmental head.

Note: This curriculum will qualify a student in the Pest Management for Plant Protection program.

Curriculum in Arts and Science, Entomology Major

Leading to the Bachelor of Science degree

		Credit
Freshman Year	**F**	**S**
Intro to Sociology, Soc 100		3
Intro to Entomology, Ent 105	3	
Fr Comp, Engl 101 or 191		3
Fitness & Lifetime Activities, PE 100	1	1
Gen Chem, Chem 112, 114	4	4
Algebra & Trigonometry, Math 113		5
Household Pest Control, Ent 191	2	
Electives	6	
	16	16

Sophomore Year	F	S
Crop & Livestock Insects, Ent 293		3
Zoological Literature, Zool 295		1
Fund of Speech, SpCm 101		3
Macroeconomic Principles, Econ 201	3	
Elementary Organic Chem, Chem 120	4	
Biology, Bio 151-153	3	3
Animal Kingdom, Zool 203	3	
Anatomy, Zool 221		3
Electives (should be humanities from approved list)	3	3
	16	16

Junior Year	F	S
Medical Entomology, Ent 393		3
American Gov't, PolS 100	3	3
Horticultural Insects, Ent 295	3	
Junior Comp, Engl 300		3
Elementary Biochemistry, Chem 260	4	

Prin of Ecology, Bio 211	3	
Mammalian Physiology, Zool 325		4
Social Science Elective (from approved list)	3	
General Electives (must be 300 or above)		4
	16	17

Senior Year	**F**	**S**
Insect Control Methods, Ent 491	3	
Genetics, Bio 371	3	
Statistical Methods, Stat 341		3
General Psychology, Psyc 101	3	
Invertebrate Zoology, Zool 357		4
Elementary Physics I, Phys 111	4	
Electives (must be 300 level or above)	4	10
	17	17

Suggested electives: Seminar in Entomology, Ent 492; General Parasitology, Zool 467; General Microbiology, Micr 231; Animal Behavior, Zool 301.

All students in Arts and Science must complete a minimum of 40 semester credits numbered 300 or above to qualify for the Bachelor of Science degree.

* Students who plan to teach in secondary schools should consult the Dean of the Education Division regarding 24 hours in Education required for certification.

Entomology (Ent)
Undergraduate Courses

105 Intro to Entomology 3(2,2) FS
Structure, development, classification and control of insects. Basic entomological information prerequisite to further study in entomology.

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.

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 to horticultural plants and a current review of effective control measures to include biological natural, chemical, cultural, and legal controls.

391 Insect Control Methods 3(2,2) F
Methods, principles, limitations, and side effects of insect control by chemical, physical, biological, and integrated means.

393 Medical Entomology 3(2,2) F
Relationship of arthropods (insects, ticks, mites and relatives) to disease in man (public health) with emphasis on the northern great plains. Open to upper classmen in Health Science, Entomology, Microbiology, Veterinary Science or Zoology.

491 Special Topics in Entomology (As arranged) FSSu
Qualified students may investigate special topics under supervision of department staff in the following and other selected areas: Medical entomology, Beekeeping, Acarology, Principles of Insect Taxonomy.

492 Entomology Seminar 1(1,0) FS
Presentation of topics based on entomological literature in scientific journals. Open to advanced undergraduate students in entomology and related sciences. Maximum of 3 credits accepted. (Major students are urged to attend all seminar sessions during junior and senior years.)

Graduate Courses

511-611 Insect Ecology and Biological Control 3(2,2) AY S
(Offered in 1983) Insects in relation to their environment. Effects of microclimate and macroclimate on predators, parasites, diseases, reproduction, development, and feeding habits of insects. Techniques for determining various factors important to survival and reproduction in the insect's environment. P, Bio 211.

521-621 Insect Anatomy 3(2,2) F
(Offered in 1982) Detailed anatomy of insects: integument, appendages, sense organs, and organ systems of representative larval, nymphal and adult forms. Consideration given to structural variation, embryology, and evolutionary relationship.

524-623 Insect Physiology 3(2,2) AY S
(Offered in 1983) Fundamental physiological processes in insects including digestion, respiration, excretion, locomotion, function of the senses and hormonal effects. Normal functioning of adult and immature stages, developmental physiology and physiology of behavior.P, Chem 260 or equivalent and consent.

561-661 Taxonomy of Insects 3(3,0) FS
Collection, identification and classification of insects. Techniques of identifying the groups of economic insect pests that affect the production of feed, food and fiber.

571-671 Principles of Insecticide Use 3(2,2) F
(Offered in 1983) Insecticides and chemosterilants, their effects, antidotes, detection, and uses. Techniques of determining insecticide resistance in an insect population, insecticide residues, and radio-active tracers in laboratory and field populations. P, Chem 130.

691 Special Topics in Entomology (As arranged) FSSu
Graduate students may conduct advanced research studies or investigate special areas other than those of a strictly taxonomic nature. Permission required.

790 M.S. Thesis in Entomology 5-7 FSSu

792 Graduate Seminar in Entomology 1(1,0) FS

Pest Management Major

This major is designed for the student who will be employed in several facets of agriculture including the agricultural chemical industry; pest management consulting firms; state and federal administrative, regulatory, and extension positions; and farming and ranching operations following graduation. The student will have breadth in the areas of pests and pest management, crop and/or livestock production and a strong base in allied science, communications and social science courses.

Freshman Year	**Credits**
Fr Comp, Engl 101 or 191	3
Fitness & Lifetime Activities, PE 100	2
Biology, Bio 151	3
College Algebra, Math 111 or Algebra & Trigonometry, Math 113	3-5
Fund of Speech, SpCm 101	3
Gen Chem, Chem 110 or 112	4
Intro to Sociology, Soc 100	3
Crop Production, PS 103	3
Soils, PS 113	3
Option & Elective courses	3-5

Sophomore Year	**Credits**
Macroeconomics Principles, Econ 201	3
Gen Microbiology, Micro 231	4
Organic Chem, Chem 120	4
Intro Physics, Phys 101 or Elementary Physics I, Phys 111 or Gen Physics I, Phys 211	4
Prin of Ecology, Bio 211	3
Crop & Livestock Insects, Ent 293	3
Prin of Plant Pathology, PS 223	3
Weed Control, PS 343	3
Field Application & Regulation of Pesticides, Ent 253 or PS 253	3
Option or Elective course	2

Junior Year	**Credits**
Genetics, Bio 371	3
Insect Control Methods, Ent 391	3
Option, Recommended Elective & General elective courses	26

Senior Year	**Credits**
Communications elective*	2
Social Science elective**	3
Humanities elective**	6

Option, Recommended elective & General elective courses 21

* Communications elective to be chosen from the following: Engl 303; MCom 210, 313, 315, 330, 331, 335; SpCm 315, 334, 335.
**See Approved listing.

Animal Science Option	Credits
Intro to Animal Science, AS 101	3
Livestock Management, AS 219	3
Animal Nutrition, AS 223	3
Feed Technology, AS 333	3
Animal Kingdom, Zool 203	3
Anatomy & Physiology of Livestock, Zool 223	4
Gen Parasitology, Zool 467	3
Animal Disease, Vet 403	3
Recommended electives*	12
General electives	17
Total	128

*Recommended Electives for Animal Science Option: Animal Science Production Courses, AS 366, 424, 277, 278; Physical Climatology & Meteorology, AE 353; Elementary Biochemistry, Chem 260; Elements of Dairying, DS 130; Prin of Econ II, Econ 202; Gen Horticulture, Hort 111; Vegetable Growing, Hort 212; Fruit Production, Hort 411; Farm Power & Machinery, MA 213; Environmental Microbiology, Micr 310; Forage Crops & Pasture Management, PS 313; Soil Fertility & Fertilizers, PS 323; Prin of Range Management, Rang 300.

Plant Science Option	Credits
Plant Kingdom, Bot 201	3
Agrostology, Bot 205	3
Plant Taxonomy, Bot 305	3
Plant Physiology, Bot 427	4
Horticultural Insects, Ent 295	3
Gen Horticulture, Hort 111	3
Soil Fertility & Fertilizers, PS 323	3
Prin of Plant Pathology II, PS 333	3
Statistical Methods, Stat 341	3
Recommended electives*	9
General electives	17
Total	128

*Recommended electives for Plant Science Option: Physical Climatology & Meteorology, AE 353; Elementary Biochemistry, Chem 260; Principles of Econ II, Econ 202; Insect Toxicology, Ent 571; Turf Management, Hort 211; Vegetable Growing, Hort 212; Fruit Production, Hort 411; Greenhouse Management, Hort 412; Woody Plants, Hort 313; Farm Power & Machinery, MA 213; Soil & Water Mechanics, MA 333: Environmental Microbiology, Micro 310; Grain & Seed Production & Processing, PS 312; Forage Crops & Pasture Management, PS 313; Irrigation — Crop & Soil Practices, PS 483; Special Prob — Plant & Pest ID only; Ent 491, PS 491, Hort 491 (2 hours); Prin of Range Management, Rang 300.

Business Emphasis

For students who plan to enter any of the business phases of agriculture, i.e., sales, administration, public relations, technical advances, etc.

Courses	Credits
Prin of Econ II, Econ 202	3
Prin of Accounting I, Actg 210	3
Business Management, B·Ad 360	3
Business electives*	12

*The business electives must be chosen from the following courses: Principles of Accounting II, Actg 211; Personal Finance, BAd 280; Business Finance, BAd 310; Business Law I, BAd 350; Business Law II, BAd 351; Money and Banking, Econ 330; Marketing, Econ 353; Marketing Management, Econ 452; Statistical Methods, Stat 341 or equivalent.

Plant Pathology Major

Offered for students interested in the intensive study of plant diseases. Courses emphasize recognition, development, and cause of diseases, and means to control them. Because fungi, bacteria, and viruses are the principal biological agents of disease, and disease is an interaction between the plant and the agents, courses should be selected that strengthen this understanding.

Curriculum in Agriculture, Plant Pathology Major

Leading to the Bachelor of Science degree

Freshman Year	F	Credit S
Fr Comp, Engl 101 or 191		3
Fitness & Lifetime Activities, PE 100	1	1
Gen Chem, Chem 110 or 112-114	4	0-4
Algebra & Trigonometry, Math 113 or 111 & 120	5-3	0-3
Intro Biology, Bio 151-153	3	3
Botany, Bot 200		3
Plant Kingdom, Bot 201		3
Unrestricted Electives*	0-2	9-2
	16	16

Sophomore Year	F	S
Macroeconomics Principles, Econ 201	3	
Fund of Speech, SpCm 101		3
Elementary Organic Chemistry, Chem 120	3	
Prin of Plant Pathology I, PS 223		3
Gen Microbiology, Micr 231		4
Physics, Phys 101 or 111-113	4	0-4
Crop Production, PS 103	3	
Intro to Sociology, Soc 100	3	
Unrestricted Electives*		1-5
	16	16

Junior Year	F	S
Soils, PS 113		3
Jr Comp, Engl 300	3	
Advanced Exposition Engl 303		2
Mycology, PS 453 (1984)	3	
Prin of Plant Pathology II, PS 333 (1983)		3
Genetics, Bio 371	3	
Plant Physiology, Bot 427	4	
Statistical Methods I, Stat 341		3
Crop & Livestock Insects, Ent 293		3
Plant Science Electives	3	
Unrestricted electives*		2
	16	16

Senior Year	F	S
Undergraduate Seminar, PS 491	1	1
Plant Science Electives	4	5
Humanities Electives†	3	3
Group I elective††	3	
Social Science Elective**		3
Unrestricted Electives*	5	4

Minor: PS 223, 333, 453, plus 7 additional credits selected from the following courses: Bio 371, Bot 261, 427, Ent 293, Micr 231.

* Recommended for science oriented majors or for graduate work: Bio 372; Bot 261, 421; Chem 232, 260; PS 443.
**Social Science elective to be selected from the approved social science listed.
†Humanities electives to be selected from the approved humanities listing.
††Group electives to be selected from the approved Group I courses in agriculture listing.

Curriculum in Arts and Science, Plant Pathology Major

Leading to the Bachelor of Science degree

Freshman Year	F	Credit S
Fr Comp, Engl 101 or 191	3	
Gen Chemistry, Chem 110	4	
Elementary Organic Chemistry, Chem 120		4
Intro Biology, Bio 151	3	
Crop Production, PS 103		3
Algebra, Math 111	3	
Intro Physics, Phys 101		4
Fitness & Lifetime Activities, PE 100	1	1

Electives*	2	4
	16	16

Sophomore Year	**F**	**S**
Fund of Speech, SpCm 101		3
Plant Kingdom, Bot 201		3
Plant Taxonomy, Bot 261	4	
Gen Microbiology, Micr 231		4
Crop & Livestock Insects, Ent 293		3
Soils, PS 113	3	
Electives*	9	3
	16	16

Junior Year	**F**	**S**
Jr Comp, Engl 300	3	
Prin of Plant Pathology I, PS 223		3
Prin of Plant Pathology II, PS 333 (1984)		3
Statistical Methods I, Stat 341		3
Electives*	10	10
	16	16

Senior Year	**F**	**S**
Mycology, PS 453 (1982)	3	
Plant Physiology, Bot 427	4	
Genetics, Bio 371		3
Undergraduate Seminar, PS 491	1	1
Electives*	8	12
	16	16

Minor: PS 223, 333, 453 plus 7 additional credits selected from the following courses: Bio 371, Bot 261, 427, Ent 293, Micr 231.

*Must include from approved list 8 hours of humanities and 10 social sciences courses with two different prefixes. Students planning to teach in the secondary schools must consult with the head of the Education Department before registering for the first term of their junior year. All students must complete a minimum of 40 semester credits in courses numbered 300 or above to qualify for the B.S. degree. Additional recommended courses include Ent 295, Micr 412, PS 443.

Soil Science Major

Designed to serve students interested in fundamental study of soils. Courses include those required by the College of Agriculture core curriculum and the agriculture science option. In addition, this major includes requirements developed by the Soil Science Society of America so each student completing the major is eligible to be certified as a soil scientist by ARCPACS (American Registry of Certified Professionals in Agronomy, Crops, & Soils.)

Graduates are prepared for employment in government services, such as US Department of Agriculture Soil Conservation Service and business and industrial concerns dealing with soils, e.g. commercial research laboratories. Students considering graduate study of soils should meet the requirements of this major.

Curriculum in Agriculture, Soil Science Major

Leading to the Bachelor of Science degree

		Credit	
Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	3	or	3
Fitness & Lifetime Activities, PE 100	1		1
Algebra & Trigonometry, Math 113	5		
Gen Chemistry, Chem 112-114	4		4
Intro Biology, Bio 151	3		
Soils, PS 113	3		
Fund of Speech, SpCm 101	3	or	3
Mathematical Analysis I, Math 123			5
	16		16

Sophomore Year	**F**	**S**
Elementary Physics I-II, Phys 111-113	4	4
Quantitative Analysis, Chem 232		4
Crop Production, PS 103	3	
Botany, Bot 200	3	
Conservation & Management of Soils, PS 372 (1982)	2	
Gen Microbiology, Micr 231	4	
Geology, PS 243		3
Prin of Economics I, Econ 201		3
Unrestricted Electives		2
	16	16

Junior Year	**F**	**S**
Jr Comp, Engl 300	3	
Adv Exposition, Engl 303		2
Intro to Sociology, Soc 100		3
Soil Geography & Land Use & Interpretation, PS 310		4
Physical Climatology & Meteorology, AE 353	3	
Physical Environment of Soils & Plants, PS 352 (1982)		2
Elementary Organic Chemistry, Chem 120	4	
Soil Fertility & Fertilizers, PS 323		3
Humanities Electives*	2	2
Unrestricted Electives		4
	16	17

Senior Year	**F**	**S**
Plant Physiology, Bot 427	4	
Soil Chemistry, PS 412 (1983)		2
Soil Microbiology, Micr 412	3	
American or State & Local Gov't, PolS 100 or 210		3
Undergraduate Seminar, PS 491	1	1
Irrigation — Crop & Soil Practices, PS 483		3
Humanities Electives*	2	
Group I Elective**	3	3
Social Science Electives†		3
Unrestricted Electives	3	
	16	15

*Humanities electives to be selected from the approved listing.
**Group I electives to be selected from the approved Group I courses in agriculture listing.
†Social science elective to be selected from the approved social science list.

Minor: PS 113, 243, or 310 (3 or 4 credits), 323, 352, 491 plus 3 or 4 additional credits selected from Plant Science courses or the following courses: AE 353, Bot 427, Chem 232, Phys 111.

Irrigation Option: A Soil Science Major will need to take MA 333.

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.

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.

303 Seed & Grain Technology 3(2,2) AY S (Offered in 1983)

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.

310 Soil Geography & Land Use Interpretation 4(3,0) F

Relationship of soil characteristics and soil classification to land use interpretations. Laboratory exercises emphasize remote sensing interpretations of soils. Field trip. Laboratory optional. P, 113 or consent.

312 Grain & Seed Production & Processing 2(2,0) AY S (Offered in 1984)

Distribution, adaptation, and culture of grain crops. Production and harvesting of seed crops. Seed processing, cleaning procedures, machinery, conditioning drying, storage, and marketing; production of certified and hybrid seed crops. P, 103 or Ho 111.

313 Forage Crops & Pasture Management 3(2,2) F

Grasses and legumes; their establishment, management, and use for hay, pasture, and silage. P, 103.

320 Crop Judging 1 or 2(0,3 per credit) FS

Seed and plant identification of crops and weeds, seed analysis and grain grading. Students are expected to enroll in the spring semester for pre-judging 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.

322 Environment & Plant Health 2(2,0) AY S (Offered in 1984)

Plant diseases caused by non-living environmental factors emphasizing variable climatic factors, soil moisture extremes, nutrient deficiencies and excesses, air pollution, and pesticides. Laboratory and greenhouse tours provide practical examples of how the environment relates to plant health.

323 Soil Fertility & Fertilizers 3(3,0) S

Soil fertility management and its effects on the growth of crops, including evaluation, uptake and utilization of specific ions by plants, use of fertilizer elements to alter soil fertility, importance of crop residue management to maintain and improve productivity, and chemical composition of fertilizers and their characteristics. P, 113 and Chem 110.

333 Principles of Plant Pathology II 3(2,2) S

Course content alternates each year. In-depth study of diseases of field crops (1983) and horticultural crops (1982). Emphasis on diagnosis, epidemiology, and control. Training is provided to develop an understanding of plant diseases that are of particular interest to the student. P, 223.

341 Weeds of the North Central States 1(0,2) Su F

Introduction to weeds common to the North Central states. Plant and seed identification. Identification by vegetative characteristics; groupings by families, field trips and plant mounts. Plant and seed collections required. Desirable antecedent Bot 261.

343 Weed Control 3(2,2) 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 Ho 111. PS 253 desirable antecedant.

352 Physical Environment of Soils & Plants 2(2,0) AY S (Offered in 1984)

Physical Properties and environment of the earth's surface as related to soil management, plant growth, ecology, and pollution abatement. P, 113 and completion of the agriculture core curriculum requirements in mathematics and physics.

372 Conservation & Management of Soils 2(2,0) AY F (Offered in 1982)

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.

412 Soil Chemistry 2(2,0) AY S (Offered in 1983)

Clay minerals in soils and their chemical reactions; soil organic matter; chelation in soils; major and minor nutrient element chemistry; salt-affected soils; the soil as a vital factor in environmental quality. P, 113.

433 World Crop & Soil Resources 3(3,0) F

Survey of the grain, root, sugar, beverage, oil, rubber, vegetable and fiber crops grown in the world. Factors influencing crop production and soil formation on a global scale. P, 103 or 113 or consent.

443 Plant Breeding 3(3,0) AY S (Offered in 1983)

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 3(2,2) AY F (Offered in 1984)

Structures, life histories, and classification of fungi.

472 Internship in Plant Science 1-12 FSSu

Supervised off campus experience with a crop production related enterprise. Provides practical experience to supplement classroom training and reinforce career objectives. Written reports required. Application for permission to register must be made.

483 Irrigation — Crop & Soil Practices 3(3,0) S

Problems of irrigated agriculture. Soil salinity and salt-affected soils, water quality, management of irrigated crops; cropping systems; water, fertility requirements of irrigated agriculture, water movement, storage, and release in soils. P, 113 and Math 111.

490 Special Problems 1-4 FSSu

Assigned readings, research, and written reports. Limit of four hours in each major for B.S. degree. P, consent.

491 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.

494 Field Experience and 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.

Graduate Courses

504-604 Virus & Bacterial Diseases of Plants 4(2,4) AY F (Offered in 1982)

Plant diseases caused by viruses, bacteria, and mycoplasma-like organisms — including identification, development, symptoms, and control. Advanced laboratory research methods used in isolation, transmission, culture, purification, microscopy, serology, and investigation of the nature and properties of important plant pathogens. P, consent.

513-613 Host-Plant Pathogen Interactions 3(2,2) AY S (Offered in 1983)

Physiology and genetics of host-parasite interactions. Disease resistance. P, consent.

533-633 Advanced Soil Genesis 3(2,3) AY S (Offered in 1984)

Detailed study of the processes of soil genesis and an examination of soil and ecosystems with respect to the soil-forming factors of time, parent material, topography, climate and organisms. P, consent.

534-634 Plant Nematology 3(2,4) AY F (Offered in 1983)

Nematode diseases of plants with emphasis on collection, isolation, preservation, symptomology, identification, life histories and control of plant parasitic nematodes. P, consent.

543-643 Physical Properties of Soils 3(3,0) F (Offered in 1982)

Exchange of energy and water at soil surfaces, infiltration and redistribution of water, and soil physical properties related to plant growth. Applications in development and utilization of soil and water resources consistent with preservation of environmental quality. P, consent.

553-653 Advanced Genetics 3(3,0) AY F (Offered in 1982)

Procedures in genetic studies as they relate to molecular and classical genetic applications.

554-654 Chemical Properties of Soils 4(4,0) AY F (Offered in 1983)

Chemical considerations of the dynamic interactions of the soil solid-water-gas phases as affected by climate, matter, added fertilizer elements, and plants. P, consent.

563-663 Environmental & Physiological Aspects of Crop Production 3(3,0) AY S (Offered in 1983)

Systems analysis of factors which limit or increase crop production and the potential for qualitative and quantitative adjustments. P, Bot 427 and consent.

573-673 Cytogenetics 3(2,3) AY F (Offered in 1983)
The nature and behavior of cell inclusions in relation to heredity. P, Bio 341 or 371.

581-681 Crop Breeding Techniques 1(1,0) AY Su (Offered in 1984)
A practiques course where artificial hybridization of crop plants will be demonstrated and carried out. Background material will be offered with each crop. Both field and horticultural crops are included.

700 Special Topics 1-6 (1,3 per credit) FSSu
780 Advanced Special Problems 1 or 2 FSSu
781 Graduate Seminar 1(1,0) FS
790 Thesis, MS. As arranged
890 Thesis, Ph.D. As arranged.

Political Science (PolS)

College of Arts and Science

Professor Cheever, head; Professors Hendrickson; Associate Professors Schwab, Tolle

Political science courses are designed to achieve the following objectives; provide the broad knowledge and engender the critical attitudes essential in a democratic society; serve the other social sciences as a cognate field; offer a comprehensive program for the major student.

Those who choose to major in political science will be preparing for a career in public affairs, the law, business, or teaching. Academic advisers will assist in planning a program suited to objectives whether it be graduate school, law school, secondary teaching, government work, or related employment. Courses in history, economics, sociology, geography, and psychology are important for an understanding of the origins and operation of political institutions, and will constitute an integral part of the student's curriculum.

Political Science Major

Political science majors may work toward either a Bachelor of Arts or Bachelor of Science degree. All are required to take 31 hours in political science including PolS 100 or 101 and PolS 392 and at least 18 additional upper division credits (above 300). PolS 210 is required for all majors who take the Education Block (see below). 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, Political Theory, and International Relations. 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.

Law Enforcement Option

Only Political Science and Sociology majors may minor in criminal justice on the SDSU campus. The program is in cooperation with USD. Consult advisors 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 requirements.

In addition, a major will be required to take four 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. (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) FSSu
Legal status, forms and functions, interrelationships, current trends and suggested reforms.

253 Current World Problems 3(3,0) S
Political characteristics of major world regions, problems and interrelationships.

265 Political Ideologies 3(3,0) S
Concepts of political science; comparative governmental structure, theories of the state, and modern ideologies.

301 Political Parties 3(3,0) F
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.

341 European Democratic Governments 3(3,0)
Comparative study of selected governments of West Europe, especially France, Germany, Italy and Sweden.

343 The U.S.S.R. 3(3,0) S
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.

351 International Politics 3(3,0) F
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)
Interrelation between culture and politics in western democracies, primarily the U.S. Interdisciplinary in approach, using works of social and political, theory contemporary history scientific survey data and analysis, humanists, cultural criticism. (Alt. yrs.)

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) S
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) F
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) S
Governmental and administrative problems of municipalities with particular reference to SD. P, 100 (or 101) or consent.

428 Personnel & Budgetary Administration 3(3,0) S
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) S
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.

492 Seminar in Political Science 1-2-3(1-2-3,0)
Selected Political Science fields. May be repeated until 6 credits are earned.

494 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.

496 Undergraduate Course Specials 1-5
See description under Undergraduate Course Specials in the Alternatives and Options for the College of Arts and Sciences.

Graduate Courses

Consent required of those students not majoring or minoring in Political Science.

592-692 Special Problems 1-2-3(1-2-3,0) FSSu
Individual guided research culminating in formal research paper. May be repeated until 6 credits are earned.

Printing (Prtg)

(See Journalism and Mass Communication)

Psychology (Psyc)

College of Arts and Science

Professor Branum, head; Professors Burke, Hillner, Ritter

The Department offers preprofessional and applied curricula in the Psychology major and a Psychology Technician major. Each curriculum requires certain core courses but they differ otherwise according to the goals of the student.

Psychology Major, Preprofessional Curriculum (BA or BS)

Those who intend to become qualified psychologists should elect the preprofessional curriculum, designed to prepare for training at the graduate level. This requires a strong foundation in techniques of analyzing behavior, historical findings and theoretical approaches, as well as a basic understanding of supporting fields. The curriculum for this major is as follows:

102, Introduction to Psychology, 4 cr.; (transfers may substitute 101, General Psychology, 3 cr.); 202, Advanced General Psychology, 3 cr.; 302, Psychological Investigations, 3 cr.; 303, Experiments in Psychology, 3 cr.; 305, Simple Learning and Conditioning, 3 cr.; 302 Human Learning and Cognitive Behavior, 3 cr.; 362, Theories of Personality, 3 cr.; 401, Psychology Seminar, 1 cr.; 409, History and Systems of Psychology, 3 cr.; 451, Abnormal Behavior, 3 cr.; Stat 341, Statistical Methods I, 3 cr. (recommended elective); 491, Problems in Psychology, 3 cr.

For the college and university requirements see the appropriate sections of the catalog.

Psychology Major, Applied Curriculum (BA or BS)

The curriculum in Applied Psychology is intended primarily for those who desire, before or apart from any consideration of graduate training, a useful knowledge of principles of behavior that might apply to any occupation that requires working with people.

The curriculum for this major is as follows:

102, Introduction to Psychology, 4 cr.; (transfers into the Psychology major may substitute 101, General Psychology, 3 cr.); 401, Psychology Seminar, 1 cr.; 491, Problems in Psychology, 3 cr.; Psychology electives appropriate to the area of interest, 16 (or 17) cr.; for a total of 24 credits in Psychology.

For college and university requirements see the appropriate sections of the catalog.

Psychological Services Major (BA or BS)

Persons interested in working as diagnostic and therapeutic aides in clinical facilities should elect the Psychological Services major. This includes familiarization with standard tests and techniques of therapy, as well as a supervised senior practicum at a treatment facility. The curriculum for this major is as follows:

102, Introduction to Psychology, 4 cr.; (transfers into the major may substitute 101, General Psychology, 3 cr.); 302, Psychological Investigations, 3 cr.; 303, Experiments in Psychology, 3 cr.; 305, Simple Learning and Conditioning, 3 cr.; 311, Physiological Psychology, 3 cr.; 321, Child Psychology, 3 cr.; 356, Psychological Assessment, 2 cr.; 357, Psychological Therapies, 2 cr.; 358, Behavior Modification, 3 cr.; 362, Theories of Personality, 3 cr.; 401, Psychology Seminar, 1 cr.; 441, Social Psychology, 3 cr.; 451, Psychology of Abnormal Behavior, 3 cr.; 488, Practicum for Psychology Technicians, 12 cr.; 491, Problems in Psychology, 3 cr.

For other college and university requirements see the appropriate sections of the catalog.

Although not a formal requirement, students will benefit by taking 305 before 306 and 362 before 357, in the Curriculum, 491 ordinarily will consist of practice testing.

Teaching Option

Students considering teaching secondary school should so notify the Departmental Teaching Coordinator and the Division of Education before their junior year. One semester of the senior year will be set aside for the education block and off-campus student 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 and original class 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

Principals of learning applied to human behavior modification. P, 101 or 102.

362 Theories of Personality 3(3,0) S

Major personality theories, including psychoanalytic, field, factor, stimulus-response and constitutional formulations. P, 101 or 102.

401 Psychology Seminar 1(1,0) F

Current employment trends and developments within the profession. Required of all majors. P, senior standing or consent.

409 History & Systems of Psychology 3(3,0) S

Origins and channels of psychological thought, from the British empiricists through major contemporary developments. P, 101 or 102.

441 Social Psychology 3(3,0) F

Basic principles, concepts and methods utilized in analyzing individual and group interactions. P, 101 or 102.

451 Abnormal Behavior 3(3,0) FSSu

Causative factors, symptoms and treatment of major forms of abnormal behavior, including neurosis, psychosis and the psychophysiologic disorders. P, 101 or 102.

488 Practicum for Psychology Technicians 12(0,12) FSSu

Supervised training and experience at an institution for behavior disorders or mental deficiency. Primarily for majors in the Psychology Technician 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.

491 Problems in Psychology 1-3 FSSu

P, 101 or 102, outline of proposed work and consent of supervising staff member. May be repeated for a total of 6 credits.

494 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.

496 Undergraduate Course Specials 1-5

See description under Undergraduate Course Specials in the Alternatives and Options for the College of Arts and Science.

Religion (Rel)

(See Philosophy and Religion)

Reserve Officer Training Program

(See Aerospace Studies, Military Science)

Secretarial Science (OEd)

(See Associate Degree and Certificate Programs)

Sociology (Soc)

(See Rural Sociology)

Rural Sociology (Soc) (Anth)

College of Agriculture and Biological Sciences

Professor Satterlee, head; Professors Dimit, Riley, Wagner; Professors Emeriti Sauer, Chittick; Associate Professors Hess, Faltemier, Mendelsohn; Assistant Professor Grant

The courses offered by the department have been organized with three definite objectives in mind; a sequence for those in Agriculture and Biological Sciences, Arts and Science or other colleges who may wish to earn an undergraduate major or minor in sociology; basic service courses that will be of interest and practical help to students in any college; courses to fulfill requirements of a major or minor toward 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, 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, 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 or 191	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)	12
Mathematics (any Math course)	3
General Psychology, Psyc 101	3
Natural Science (From approved list. Select from at least two areas with different course prefixes. Three hour course with laboratory is required.)	8
Social Science electives (outside major dept.)	3
Major in Sociology	31
Include Soc 100, 301, 310, and 22 additional elective Sociology or Anthropology credits.	
General electives	46
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	**16**
(Include Soc 100, 301, 310 and 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 or 191	3
Jr Comp, Engl 300	3
Fund of Speech, SpCm 101	3
Fitness & Lifetime Activities PE 100 (two semesters)	2
Humanities (from approved list)	8
Mathematics (any Math course)	3
General Psychology, Psyc 101	3
Natural Science (from approved list)	
Biological Science	6
Physical Science	8
Social Science electives (outside major dept.)	3
Major in Sociology	31
Include Soc 100, 301, 310 & 22 additional elective Sociology or Anthropology credits.	
General electives	46
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 **16**

(Include Soc 100, and additional 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 or 191	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, 115 or 211	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 electives (To be selected from courses in Biol, Ent, Zool, Micr, Pl Path, or WL 363 or 367)	6
Major in Sociology (Same as BA in Arts and Science)	31
General electives	46

Majors need to consult their adviser for recommended electives to best fit career aspirations.

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 **16**

(Same as BA 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) FS
Physical anthropology, archaeology and linguistics, analysis of concepts of society and culture. Emphasis on nonliterate peoples of the world. P, Soc 100.

320 Cultural Anthropology 3(3,0) S
Meaning of culture, its significance for humans, its diverse forms among peoples, past and present. P, Soc 100.

321 High Cultures of Central & South American 3(3,0) (On Demand)
A cultural survey of the Aztec, Maya and Inca Indian civilizations. Factors and processes of growth that shaped cultural history in Mexico, Guatemala and Peru, before the advent of the whiteman.

421 Indians of North America 3(3,0) FSSu
Provides prospective teachers and those interested in Indian people with a basic knowledge of Indian history and culture. Emphasis on the Dakota Indians.

492 Cooperative Education/Internship/Field Experience in Anthropology 3-12 FSSu
Planned and supervised professional experience related to Anthropology which takes place outside the formal classroom with business, industry, private/public agencies. Credit will not count toward meeting minimum requirements of the major or minor. May be repeated until 12 credits are earned. Graded S or U; P, major or minor; P, consent of department program coordinator.

Graduate Courses

590-690 Special Problems 1-3 FSSu
P, open to undergraduate and graduate students with sufficient background and consent.

791 Seminar 1-4 FSSu (On demand)

Sociology (Soc)

Undergraduate Courses

100 Introduction to Sociology 3(3,0) FSSu
Comprehensive study of society, with analysis of group life, and other forces shaping human behavior. Prerequisite to most courses numbered above 100.

150 Social Problems 2(2,0) FS
Present day problems in American society, such as crime, divorce, alcoholism, drug addiction, old age physical and mental health — their significance and current methods of prevention and treatment. P, 100.

240 Rural Sociology 2(2,0) 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. P, 100.

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. P, 100 or consent of instructor.

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(3,0) 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) FS
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) F
Patterns of urban growth, demographic and ecological processes, institutions, folkways, dynamics of social class, and social problems of modern city and urban fringe areas. P, 100.

350 Race and Nationality Problems 2(2,0) (On demand)
Sociological phenomena of ethnic relations, developmental processes, problems and consequences. P, Soc 100.

351 Criminology 3(3,0) F
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. P, 100.

353 Sociology of Work 2(2,0) S
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) F
Theories of population: factors involved in birth rate, death rate, and migrations. Social consequences of population change; problems of population composition and population policy. P, 100.

370 Social Legislation 3(3,0) S
Historical development of social welfare legislation; current trends and issues in, and implementation and administration of social policy. P, 100.

382 The Family 3(3,0) F
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. P, 100.

451 Juvenile Delinquency 3(3,0) S
Juvenile court system; causes of delinquency; patterns of delinquent behavior; and alternative solutions currently in operation throughout the US which attempt to reduce the incidence of juvenile delinquency. P, 100.

471 Social Work Skills & Methods I 3(3,0) F
Basic concepts and methods common to all social service practice; focus on developing interactional skills. (Should be taken prior to the Practicum in Soc 492. P, 270.)

490 Special Problems 1-3 FSSu
P, major or minor and junior or senior standing.

491 Seminar 1-3(1,0) FSSu
Focus will vary in areas of sociology, anthropology, teaching and research, and by option. Can be repeated. P, Soc 100.

494 Cooperative Education/Internship/Field Experience in Sociology 3-12 FSSu
Planned and supervised professional experience related to Sociology which takes place outside the formal classroom with business, industry, private/public agencies. Credit will not count toward meeting minimum requirements of the major or minor. May be repeated until 12 credits are earned. Graded S or U; P, major or minor; P, consent of department program coordinator.

497 Topics in Sociology 1-3 FSSu
Selected topics of current interest in Sociology. Subject areas vary from semester to semester based on general interest appeal.

Graduate Courses

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.

515-615 Social Thought 3(3,0) Su (Offered in 1982)
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 (consent).

520-620 Social Organization 3(3,0) F (Offered in 1982)
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 (consent).

521-621 Social Stratification 3(3,0) S (Offered in 1984)
Theories of social stratification. Relationship between social class and education, occupational choice, political preference, religious affiliation and social mobility. P, undergraduate or graduate (consent).

530-630 Social Change 3(3,0) F (Offered in 1983)
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 (consent).

533-633 Leadership & Group Organization 3(3,0) Su (Offered in 1983)
Emergence of and types of leaders. Analysis of community power structure. Emphasis on group dynamics, small groups and effective meetings. P, undergraduate or graduate (consent).

540-640 Rural Community Planning
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 foci.

710 Research Methods 3(3,0) S (1983)
712 Sociological Theory I 3(3,0) F (1982)
713 Sociological Theory II 3(3,0) S (1983)
760 Advanced Demographic Theories and Techniques 3(3,0) F (1982)
780 Special Problems 1-3(1-3,0) FSSu
781 Internship in Planning 1-6 FSSu
790 Thesis, M.S. as arranged
791 Seminars 1-4 (On demand) FSSu
793 Research Paper in Sociology 1-3 FSSu (As arranged)
890 Thesis, Ph.D. as arranged

Speech (Sp)

College of Arts and Science

Associate Professor Zivanovic, Head; Professor Emeritus Stine; Professors Denton, Hoogestraat, Johnson, Meyer, Widvey; Associate Professors Ferguson, Schliessmann; Assistant Professors Gotsch, Hefling, Lampson.

You may major or minor in speech, elect courses for self improvement, take courses to meet humanities requirements, or participate in speech activities. The major may choose any of the following options:
Option A — General Speech (Balanced curriculum); Option B — Theatre; Option C — Speech Communication; Option D — Mass Communication; Option E — Communication Disorders; Option F — Speech Education.

Advanced Placement in Speech
All students are required to take Speech (SpCm) 101 for graduation; however, those with previous training and experience in speech may apply to the department to take an advanced course or courses in Speech and earn credit for 101 concurrently. The disposition of the application for advanced placement rests with the departmental administrator. Application must be made by the end of the third semester or prior to the fourth semester of residence.

Co-curricular Activities Theatre
Professor Johnson, Director of Theatre
Several major, experimental and student productions each year. You may be cast in or assist with a production. University credit may be earned.

Forensics
Professor Widvey, Director of Forensics
Local, regional and national participation in debate, extempore speaking, oral interpretation, and oratory is sponsored. Any student is eligible. University credit may be earned.

Radio, Television, and Film
Opportunities are provided to perform and assist in production in broadcast facilities. University credit may be earned.

Speech and Hearing Clinics
Professor Meyer, supervisor

Clinical speech and hearing services are available to students under the supervision of American Speech and Hearing Association certified clinicians.

Curricular Program
Major: 36 credits in Speech, including SpCm 101, approved by the department. Not more than 13 credits chosen from the activity courses (MCom 132, SpCm 281, Thea 135, 145, 195 and 495) may be counted toward the major.

Minor: 20 semester credits (including SpCm 101) approved by the head of the department. Not more than 8 credits chosen from activity courses (MCom 132, SpCm 281, Thea 135, 145, 195 and 495) may be counted.

Upper Level Requirements
See College of Arts and Sciences requirements.

Option A — General Speech (Balanced Curriculum)

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

	Credits
Fr Comp, Engl 101 or 191 & 300	6
Fund of Speech, SpCm 101	3
Fitness & Lifetime Activities, PE 100	2

Natural Science (2 prefixes)	8
Social Science	12
Humanities	12
(From 2 disciplines other than Speech and Foreign Languages.)	
Foreign Language	14
Major (in addition to SpCm 101)	33
Electives (including 23 credits for prospective teachers)	35
Total	**128**

Curriculum in Arts and Science, Speech Major

Leading to the Bachelor of Science degree

	Credits
Fr Comp, Engl 101 or 191 & 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	8
(From 2 disciplines other than speech)	
Major (in addition to SpCm 101)	33
Electives (including 23 credits for prospective teachers)	47
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 495, 135, 145; SpCm 101, 330 or 442; three credits selected from Thea 510 or 560; and ten credits of electives chosen from courses prefixed Thea.

The humanities requirement is to be fulfilled by selecting courses from Art, Dance, Music, Dramatic Literature Classes in English, and the course History of Costume.

Students seeking a **minor** with Theatre emphasis should complete — Thea 100, 131, 141, 351 or 590; five credits chosen from Thea 495, 135, 145; SpCom 101 and sufficient electives chosen from courses prefixed Thea to raise the combined total to 20 credits.

Option C —Speech Communication

Students seeking Option C, **Speech Communication,** should complete their **major** as follows: DCom 112, GCom 211, 223, MCom 130, SpCm 101, 315, 322, 330, 334, 335; and sufficient electives to raise the combined total to 36 credits.

Option D — Mass Communication

Students seeking Option D, **Mass Communication** should complete their **major** as follows: MCom 130, 331, 330, 260, 333, 336, 361, 335, 372, 332, and four credits of 132, SpCm 101 and sufficient electives to raise the combined total to 36 credits.

Option E — Communication Disorders

Students seeking Option E, **Communication Disorders** should consult Dr. Meyer to plan a program leading to certification.

Prospective public school speech therapists should consult the state department of education in the state or states where they wish to practice. Certification for SD Public School Therapists is granted by the Division of Elementary and Secondary Education, Pierre.

Option F — Speech Education

Students seeking Option F, **Speech Education,** should complete their **major** as follows: DCom 112, 131, SpCm 101, 222, 330, 375, Thea 131, 141, 351; and 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 in the Department of Education requires of all secondary school teachers. Students who plan to teach in the secondary schools should consult the dean of the Division of Education before their junior year.

Courses Offered

The courses in the Speech Department are divided into five areas: Communication Disorders (DCom), General Communication (GCom), Mass Communication (Com), Speech Communication (SpCm), and Theatre (Thea).

Communication Disorders (DCom)

Undergraduate Courses

112 Voice & Articulation 2(2,0) F
Improvement in articulation, pitch, rate, volume; quality.

131 Introduction to Speech Correction 3(3,0) FS
Survey of common speech problems, their correction and prevention. Emphasis on voice and articulation problems.

212 Language Development 3
Emphasis on the acquisition and development of language, verbal and non-verbal, as children learn to communicate effectively by selecting the most appropriate communication strategies.

310 Current Methods in Speech Correction 3(3,0) S (A.Y.)
Treatment and prevention of speech and language disorders. P, 131.

321 Audiology 4(3,0) S (A.Y.)
Pathologies of the ear. Hearing rehabilitation. Administering and interpreting hearing tests. P, consent of instructor.

330 Speech Pathology 3(3,0) F (A.Y.)
Planning and operating public school remedial program. P, 131.

336 Diagnostic Methods in Speech Disorders 3(3,0) S (A.Y.)
Diagnostic tools for Speech and Language Disorders. P, 131.

341 Clinical Practice in Speech Therapy 1-2 Cr. FSSu
May be repeated for total of 6 credits. P, consent.

432 Special Problems in Speech Reeducation 1-2 Cr. FSSu
May be repeated to a total of 6 credits. P, consent.

441 Clinical Practice in Audiology 1-2 Cr. FSSu
May be repeated for a total of 4 credits. P, consent.

General Communication (GCom)

Undergraduate Courses

211 Phoentics 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.

392 Directed Studies*

394 Undergraduate Course Specials*

494 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) SSu (A.Y.)
(See Journalism section.) May count toward Speech major.

Ling 543-643 Development of the English Language 2(2,0) S
(See English Section.) May count toward Speech major.

Mass Communication (MCom)

Undergraduate Courses

130 Intro to Radio & TV 3(3,0) F
History, structure, regulation, and financial support; potentialities and limitations; public responsibilities, impact on society.

132 Mass Communication Activities 1(0,3) FSSu
Credit earned by active participation in broadcasting and film activities, May be repeated until eight activity credits are earned. P, consent.
Section I: Radio: P, MCom 130 or MCom 152 and consent of instructor.
Section II: Television: P, MCom 331 or consent of instructor.
Section III: Film: P, MCom 361 and consent of instructor.

260 Introduction to Film 3(3,0) F
Film as art; themes and invetions; 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 4(2,6) F*

333 Radio News Reporting 2(1,3) F*

335 Broadcast Programming 3(3,0) S (A.Y.)
Program types and essentials of effective structure. Audience characteristics and preferences. Managerial problems. Special consideration of agricultural, commercial, and educational broadcast requirements.

336 Radio News Lab 1-3 S*

361 Film Production 3(2,3) S (A.Y.)
Production methods as a tool of observation and personal expression, technique of animation, news — documentary, and commercial production.

372 Radio TV Advertising 3(2,3) S*

460 Film Narrative 3(2,3) S
Myths, values and beliefs as expressed in selected films; forms, styles, and directors.

* (See Journalism section.) May count toward Speech major.

Graduate Courses

537-637 Educational Radio & TV 3(3,0) (Offered on Demand)
Educational broadcasting with practical work in preparation and presentation of educational and instructional materials for radio, TV, and film and their use in the classroom.

560-660 Special Problems in Radio, TV, or Film 1-2 cr. FSSu
Directed research. May be repeated to a total of 6 credits. P, consent.

564-664 Film Studies 3(3,0) (A.Y.)
Film art forms, artists and critics. Viewing and making films. Emphasis on major film theories.

791 Research Methods in Communications 3(3,0)
(See Journalism section.) May count toward graduate major in speech.

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(2,0) F (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) FSSu
Active participation in forensic activities. May be repeated for a total of 8 credits. P, consent.

315 Public Speaking 3(3,0) FS
Theory and practice of public speaking, including speaking for special occasions. P, SpCm 101.

322 Argumentation 3(2,0) S (A.Y.)
Argumentative theory. Analytical investigation of strategies and contracts, with major emphasis on effective argumentation.

330 Oral Interpretation 3(3,0) FS Oral interpretation of literature.

334 Discussion 2(2,0) FS
Nature, values, and limitations of discussion. Theory and practice.

335 Parliamentary Procedure 2(2,0) FS
Organizing and conducting meetings.

375 Teaching of Speech 3(2,0) F (A.Y.)
Problems of the speech teacher. Curriculum, instructional materials, and methods.

442 Advanced Oral Interpretation 3(3,0) F (A.Y.)
In-depth analysis of literary types and use in group production situations. P, SpCm 330 or consent.

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) FSu (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) FSu (A.Y.)
Relations between symbols; human behavior in reaction to symbols including unconscious attitudes, linguistic assumptions; and the objective systematization of language.

566-666 Rhetorical Theory 3(3,0) FSu (A.Y.)
Historical development of rhetorical theory from classical to modern.

576-676 Directing Speech Activities 3(3,0) SSu
Organizing and directing declamation, dramatic, and forensic programs.

592-692 Special Problems in Oral Interpretation 1-2 cr. FSSu
Directed research. May be repeated to a total of 6 credits. P, consent.

594-694 Special Problems in Public Address 1-2 cr. FSSu
Directed research. May be repeated to a total of 6 credits. P, consent.

790 Thesis 5-7 FSSu

Theatre (Thea)

Undergraduate Courses

100 Introduction to Theatre 3(3,0) FS
Background of theatrical arts: Production, plays, history, and theory.

131 Acting 3(3,0) FS
Basics of acting.

135 Theatre Activities — Acting 1(0,3) FSSu
Credit earned by active participation in acting roles. May be repeated for a total of 8 credits. P, consent.

141 Stagecraft 3(2,3) FS
Scenery construction, rigging, and painting, 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
Historic, aesthetic, and functional elements of costume design.

241 Make-up for the Stage 2(2,0) F
Principles and application of stage make-up.

341 Scene Design 3(2,3) S (A.Y.)
History of set design, planning and designing for stage. Lab work on two major theatre productions.

351 Directing 3(3,0) S (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
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.

495 Summer Theatre 5(0,15) Su
Credit earned by participation in State University Theatre's repertory company. May be repeated to a total of 10 credits, but only 5 may be applied to a minor.

Graduate Courses

510-610 Dramatic Literature S (A.Y.)
Intensive reading of plays.

560-660 History of Theatre 3(3,0) S (A.Y.)
Periods, theatres, and representative dramatic literature from primitives to present day.

590-690 Special Problems 1-2 cr. FSSu
Directed research. May be repeated to a total of 6 credits. P, consent.

Statistics (Stat)

Administrative Committee: Professors Dimit, Hsia, Kim, Storry, Tucker; Associate Professors Edeburn, Evenson, Lacher, McKeown, Monahan, Nielsen. Teaching Faculty: Professors Hsia, Kim; Associate Professors Evenson, Lacher, Monahan, Nielsen; Assistant Professors Ellingson, Wicks; Coordinator of Instruction: Professor Tucker.

Statistics is the development and application of the most effective methods of collecting, tabulating, and interpreting quantitative data in such a manner that the validity of conclusion and estimates may be assessed by means of inductive reasoning based on the mathematics of probability.

Statistics teaching is governed by an administrative committee appointed by and responsible to the Vice President for Academic Affairs. The statistics faculty is appointed by the Vice President for Academic Affairs from the departments involved in this area.

Undergraduate Courses

211 Survey of Statistical Applications 3(3,0) FSSu
A broad overview of the uses of descriptive and interential statistics. Basics of frequency, central tendency and variation are presented and their applications, and misapplications, are discussed in detail. P, Math 111 or equivalent. Not a prerequisite for advanced statistics courses.

341 Statistical Methods I 3(2,2) FSSu
Concepts in probability, data description, distributions, sampling, statistical inferences (parametric and non-parametric). P, Math 113 or 111. Credit will not be given for both 211 and 341.

Math 381 Mathematical Statistics 3(4,0) FS
Statistical methods and probability, especially in engineering and physical sciences. Common single and multiple variable densities and moment generating functions. Applications of random sampling to hypothesis testing, confidence limits, correlation, and regression. P, 224.

Econ 423 Statistic 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

641 Statistical Methods II 3(3,0) FS
Analysis of variance, various types of regression and other statistical techniques and distributions. Sections offered in the areas of Biological Science. Physical Science, and Social Science. P, 341 or Math 381.

791 Special Topics in Statistics 1-3,6 max/student
Advanced study of one or more selected topics as student need justifies such as sampling, statistical genetics, multivariate statics. P, Stat 641.

Textiles, Clothing and Interior Design (TCID)

College of Home Economics

Professor Semeniuk, acting head; Professor Emeriti Lund, Rosenberger, Stoflet; Associate Professors Sivers (Emeritus), Yost; Assistant Professor Kamstra, Lyons; Instructor Moore

Majors in Textiles, Clothing and Interior Design
1) Textiles and Clothing major with options in Retailing and Apparel Design.
2) Interior Design major.

Students electing these majors must have achieved a 2.2 GPA at end of the sophomore year. To enroll in the Professional Practicum (TC/ID 494) a student must have 95 semester credits and a 2.2 GPA. Retail experience is recommended before the Professional Practicum. In addition at least a "C" must be earned in the required TC, ID or TC/ID courses, for graduation.

A double major in Textiles and Clothing and in Interior Design area requires careful and early planning. Some courses are offered alternate years while others may be offered only once a year. Consult your adviser.

Minors in Textiles, Clothing and Interior Design

Sixteen credit hours are required for a Minor in Textiles and Clothing or a minor in Interior Design. Consult with your advisor early in your program if you are considering a minor.

Requirements for a Minor in Textiles and Clothing

	Credits
Textiles, TC 242	3
Fashion Economics, TC/ID 363	3
Clothing Construction Principles, TC 112	2
Textiles and Clothing Electives	8
	16

Requirements for a Minor in Interior Design

	Credits
Introduction to Interior Design, ID 221	3
Interior Design Fabrics, ID 310	3
Interior Design Electives	10
	16

A double major in TC and ID requires early planning with your advisor, since some courses are offered only alternate years while others may be offered alternate semesters.

Honors Program

This is designed for the Student with high scholastic standing 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 selected with the help of academic advisers.

Fashion Institute of Technology

The College of Home Economics is affiliated with the Fashion Institute of Technology (FIT) in New York City.

Senior status (95 semester credits) and a minimum of 2.5 GPA (on 4.0 scale) is required for FIT consideration. See TCID department head for further information. Planning should begin in Sophomore year.

Previously approved FIT courses may be transferred as electives toward the SDSU degree.

Textiles and Clothing Major

Courses in textiles and clothing provide knowledge applicable to the use of clothing and household fabrics by individuals and families. The scientific and cultural aspects of textiles and clothing are examined, with emphasis on aesthetic, economic, sociological, and psychological aspects.

Apparel Design Option

The curriculum in Apparel Design is designed for those interested in the aesthetic aspects of textiles and clothing and in apparel designing.

Retailing Option

The Retailing curriculum is designed for students interested in careers in the marketing of textiles and clothing products by retailers and manufacturers.

Interior Design Major

The curriculum in interior design prepares students to enter the profession as a residential/commercial designer through knowledge of resources, interpretation of problems and development of solutions.

Textiles and Clothing — Apparel Design Option

A. Home Economics **60**
1. Child Development & Family Relations 2
   CDFR 101 Family Development, 2 cr.
2. Home Economics Education 4
   HE 101 Field Experience, 1 cr.
   HEd 101 Career Exploration 1 cr.
   HE 102 Managing Family Resources 2 cr.
3. Nutrition & Food Science 2
   NFS 101 Nutrition & Family, 2 cr.
4. Textiles, Clothing & Interior Design 34
   TC 101 Clothing & the Family, 1 cr.
   ID 102 Housing & the Family, 1 cr.
   TC 112 Clothing Construction Principles, 2 cr.
   TC 242 Textiles, 3 cr.
   TC 314 Creative Clothing, 4 cr.
   TC 315 Apparel Design, 3 cr.
   TC 363 Fashion Economics, 3 cr.
   TC 372 History of Costume, 3 cr.
   TC 412 Tailoring, 3 cr.
   TC 413 Socio-Psychological Clothing Aspects, 3 cr.
   TC 415 Experiences in Clothing Problems, 3 cr.
   TC Electives, 5 cr.
5. Electives from HE, CDFR, NFS, HEd, TC, ID or previously approved FIT courses 18

B. Communication **9**
   Eng 101 or 191 Freshman Composition, 3 cr.
   Eng 300 Junior Composition, 3 cr.
   SpCm 101 Fundamentals of Speech, 3 cr.

C. Natural Science **15**
   Chemistry with lab — Chem 110 or 112, 4 cr.
   Natural Science electives, 8 cr.
   Math 111, 3 cr.

D. Social Science **12**
   Econ 201, 3 cr.
   Psyc 101, 3 cr.
   Soc 100, 3 cr.
   History elective, 3 cr.

E. Humanities **6**
   Art 123 Design I, 3 cr.
   Humanities electives, 3 cr.

F. Art **15**

G. Physical Education **2**
   PE 100 Fitness & Lifetime Activities, 2 cr.

H. Electives **9**

Total Credits to Graduate **128**

Textiles & Clothing — Retailing Option

Students completing their sophomore year should seek summer retail experience before the end of the junior year.

A. Home Economics **60**
1. Child Development & Family Relations 2
   CDFR 101 Family Development, 2 cr.
2. Home Economics Education 4
   HE 101 Field Experiences, 1 cr.
   HE 102 Managing Family resources, 2 cr.
   HEd 101 Career Exploration, 1 cr.
3. Nutrition & Food Science 2
   NFS 101 Nutrition & the Family, 2 cr.
4. Textile, Clothing & Interior Design 42
   TC 101 Clothing & the Family, 1 cr.
   ID 102 Housing & the Family, 1 cr.
   ID 211 Art in Today's Home, 2 cr.
   ID 221 Introduction to Interior Design, 3 cr.
   TC 242 Textiles, 3 cr.
   TC 315 Apparel Design, 3 cr.
   TC/ID 363 Fashion Economics, 3 cr.
   TC 372 History of Costume, 3 cr.
   TC/ID 373 Merchandising, 3 cr.
   TC 413 Socio-Psychological Clothing Aspects, 3 cr.
   TC/ID electives, 9 cr.
   TC/ID 494 Professional Practicum, 8 cr.
5. Electives from HEd, CDFR, HE, TCID, NFS or FIT courses (prior approval) 10

B. Communications **9**
   Eng 101 or 191 Freshman Composition, 3 cr.
   Eng 300 Junior Composition, 3 cr.
   SpCm 101 Fundamental of Speech, 3 cr.

C. Humanities **6**
   Art 123 Design I, 3 cr.
   Humanities electives, 3 cr.

D. Natural Science **15**
   Chemistry with Lab — Chem 110 or Chem 112, 4 cr.
   Natural Science elective, 8 cr.
   Math 111, 3 cr.

E. Social Science **12**
   Econ 201 Principles of Economics, 3 cr.
   Psyc 101 General Psychology, 3 cr.
   Soc 100 Introduction to Sociology, 3 cr.
   History elective, 3 cr.

F. Physical Education **2**
   PE 100 Fitness & Lifetime Activities, 2 cr.

G. Art **6**
   Art electives, 6 cr.

H. Economics **12**
   Economics and/or Business Administration electives, 12 cr.

I. Electives **6**

Total credits to Graduate **128**

Interior Design Major

A. Home Economics **63**
1. Child Development & Family Relations 2
   CDFR 101, Family Development, 2 cr.
2. Home Economics Education 4
   HE 101 Field Experience, 1 cr.
   HEd 101, Career Exploration, 1 cr.
   HE 102 Managing Family Resources, 2 cr.
3. Nutrition & Food Science 2
   NFS 101 Nutrition & the Family, 2 cr.
4. Textiles, Clothing, & Interior Design 46
   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 322/323 Intermediate Interior Design I, 3 cr.; Intermediate Interior Design II, 3 cr.
   ID 331 Family Housing, 3 cr.
   ID 363 Fashion Economics, 3 cr.
   TC/ID 373, Merchandising, 3 cr.
   ID 422/423 Advanced Interior Design I, 3 cr.; Adv Interior Design II, 3 cr.
   ID 424-425 Historical Backgrounds, I and II 6 cr.
   TC/ID 494 Professional Practicum, 8 cr.
5. Electives from NFS, HEd, CDFR, TC, ID, HE 9

B. Communications **9**
   Engl 101 or 191 Freshman Composition, 3 cr.

Engl 300 Junior Composition, 3 cr.
SpCm 101 Fundamentals of Speech, 3 cr.

C. Humanities 6
Art 123, Design I, 3 cr.
Humanities electives, 3 cr.

D. Natural Science 15
Chemistry with lab — Chem 110 or 112, 4 cr.
Natural Science electives, 8 cr.
Math 111, 3 cr.

E. Social Science 12
Econ 201, 3 cr.
Psyc 101, 3 cr.
Soc 100, 3 cr.
History elective, 3 cr.

F. Physical Education 2
PE 100 Fitness & Lifetime Activities, 2 cr.

G. Art 15
Art electives, 15 cr.

H. Other requireds 6
Engr Gr 223, Architectural Graphics, 3 cr.
E Pow 300, Fundamentals of Lighting, 3 cr.

Total to Graduate 128

Undergraduate Courses Interior Design (ID)

102 Housing and the Family 1(1,0) FS
Space allocation and aesthetic considerations in family housing and how these change during the life cycle.

***211 Art in Today's Home** 2(1,2) FS
Elements and principles of design as they relate to accessorizing the home.

221 Introduction to Interior Design 3(0,6) FS
Emphasis on functional application of principles and elements of design to the home. Principles of drawing plans and elevations.

***310 Interior Design Fabrics** 3(2,2) S
Relationship of weight, color, texture, design of textiles to their application in interiors. Sources and historical background are explored. Lab: Designing and creating appropriate window treatments. P, 242.

322 Intermediate Interior Design I 3(0,6) F
The design process, developing skill in measuring, and calculating 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.

331 Family Housing 3(2,2) FS
An overview of housing in America including historical influence, space planning, energy conservation, and financing.

363 Fashion Economics 3(3,0) F
History and development of fashion industry. Social and economic factors that influence fashion demand. Activities involved in the production, distribution, and consumption of fashion goods.

373 Merchandising 3(3,0) S
Retailing terminology and problem solving. Sales promotion through displays. Professional qualifications desirable in merchandising field. Field trip to apparel industry center required.

422 Advanced Interior Design I 3(0,6) F
Experience in solving design problems of a theoretical nature within the frame of a business. P, 323.

423 Advanced Interior Design II 3(0,6) S
Experience in solving design problems of commercial and contract interiors. P, 422.

424 Historical Backgrounds of Homes & Furnishings I 3(3,0) F
Historical Backgrounds: from Antiquity through the Renaissance.

425 Historical Backgrounds of Homes & Furnishings II 3(3,0) S
Historical Backgrounds: from Renaissance to present.

471 Special Problems in Textiles, Clothing & Interior Design 1-4
Problems for independent study selected according to special interests and needs.

494 Professional Practicum 1-12 FSSu
Supervised work experience in a cooperating retail firm or design studio. Provides opportunities for interaction between business, community and the university. P, TC/ID 373, Sr. Classification, Minimum GPA 2.2

Undergraduate Courses Textiles & Clothing (TC)

101 Clothing & the Family 1(1,0) FS
Aesthetic and practical clothing needs of the family and how these needs change during the life cycle.

112 Clothing Construction Principles 2(0,4) FS
Basic construction techniques used in garment construction; use of commercial patterns. Open to all students.

171 Clothing Selection 2(2,0) FS
Social, psychological and economic factors affecting dress; selection and coordination of wardrobe.

242 Textiles 3(2,2) FS
Textile fibers, yarns, fabrics, and finishes. Selection, use and care of textiles and clothing. Textile standards and legislation. P, Sophomore standing.

314 Creative Clothing 4(2,4) FS
Principles of flat pattern design. Development of original designs through modification of basic sloper. P, 112.

315 Apparel Design 3(1,4) F
Study of past and present fashion designers. Fashion illustration techniques are emphasized. Structural and applied design is included. P, ArtS 123.

363 Fashion Economics 3(3,0) F
History and development of fashion industry. Social and economic factors that influence fashion demand. Activities involved in the production, distribution, and consumption of fashion goods.

372 History of Costume 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. Consent of instructor.

373 Merchandising 3(3,0) S
Principles of merchandising as applied to textiles and apparel in retail firms. Study of customer demand, buying, inventory, control and promotion. Orientation to Practicum in retail merchandising and interior design. Field trip to market center is required.

412 Tailoring 3(0,6) F
Custom-tailoring techniques applied in suits and coats. P, 112.

413 Socio-Psychological Clothing Aspects 3(3,0) F
Clothing theories with culture and human behavior.

***415 Experiences in Clothing Problems** 3(0,6) S
Advanced problems in clothing construction. Interpretation of client's design ideas into a finished garment. P, 314 or consent of instructor. Offered alternate years beginning Spring 1981

***443 Advanced Textiles** 3(2,3) S
Effect of the components of a fabric on total fabric properties; laboratory problems using research equipment. P, 242, Chem 120.

471 Special Problems in Textiles, Clothing & Interior Design 1-4
Problems for the independent study selected according to students' special interests and needs.

494 Professional Practicum 1-12 FSSu
Supervised work experience in a cooperating retail firm or design studio. Provides opportunity for interaction between business, community and the university. P, TC/ID 373 Sr. classification, Minimum GPA 2.2.

Graduate Courses

544-644 Textiles Chemistry 3(2,2) (Offered on demand)
Chemistry of textiles including laboratory study of physical and chemical properties of textile fibers and fabrics. Juniors and seniors by special permission.

573-673 Fashion, Art & Textile Tour 3(3,0) Su
Understanding the interrelationship of fashion, art and textiles of a specific area of the world. Study of the arts from a historical and contemporary approach. Open to juniors, seniors and graduates.

592-692 Special Problems in Textiles, Clothing, & Interior Design 1-4
773 Costumes & Textiles Through the Ages 3(3,0) On demand.
774 New Developments in Textiles 3(3,0) Su
790 Seminar in Textiles, Clothing & Interior Design 1-2

* Require special fees, equipment, supplies or materials.

Veterinary Science (Vet)

College of Agriculture and Biological Sciences

Professor Vorhies, head; Professor Emeritus Harshfield; Professors Bergeland, Roller, Swanson; Associate Professors Bailey, Johnson, Kirkbride, McAdaragh, Nelson, Toth; Assistant Professors Benfield, Eustis, Francis, Shave; Instructors Leslie-Steen, Libal, Stotz; Adjunct Professor Evanson.

Complex systems of livestock farming and transportation have greatly increased the opportunity for introduction of animal and avian diseases into herds and flocks. Livestock and poultry producers must give attention to disease prevention and control in their farming and ranching operations. The courses in this department are planned to meet the demand for information in this field, as well as provide basic information in auxiliary areas.

South Dakota does not have a professional College of Veterinary Medicine. A pre-veterinary curriculum is offered which allows students to obtain prerequisites for application to Colleges of Veterinary Medicine in other states. Exceptional students may meet requirements in three years of pre-veterinary study. Most, however, require four years of pre-veterinary work, and many complete a Bachelor of Science Degree before entering professional curriculum of Veterinary Medicine.

Entrance into the professional curriculum in a College of Veterinary Medicine rests with the individual applicant, and is based upon many factors, including their previous academic record. Keen competition should be anticipated, and the student should be aware of the difficulties involved in acceptance to a College of Veterinary Medicine.

The State provides loans to students enrolled in the professional curricula. These loans are administered by the State Board of Regents. The applications forms can be obtained by writing the Board of Regents, Office Building No. 3, Pierre, S.D. 57501.

Suggested Pre-Veterinary Curriculum

	Credit		
Freshman Year	**F**		**S**
Fr Comp, Engl 101 or 191	3	or	3
Algebra, Math 111 or Algebra & Trigonometry, Math 113	3	or	5
Gen Chemistry, Chem 112-114	4		4
Intro Biology, Bio 151-153	3		3
Fund of Speech, SpCm 101	3	or	3
Elements of Dairying, DS 130	3		
Intro to Animal Science, AS 101			3
Elective			3
Fitness & Lifetime Activities, PE 100	1		1
Sophomore Year	**F**		**S**
Fund of Organic Chemistry, Chem 222-224	4		4
Elementary Physics, Phys 111-113	4		4
Animal Nutrition, AS 223			3
Poultry Management, AS 366	3		
Invertebrate Zoology, Zool 357			4
Vertebrate Zoology, Zool 365	4		
Junior Year	**F**		**S**
Quantitative Analysis, Chem 232	4		
Biochemistry, Chem 260			4
Gen Microbiology, Micr 231			4
Embryology, Zool 383	4		
Jr Comp, Engl 300 & Advanced Exposition, Engl 303	3		3
Genetics, Bio 371	3		
Electives	3		4

* This curriculum does not meet the pre-veterinary requirements of all Colleges of Veterinary Medicine. The student and his adviser, may alter the pre-veterinary curriculum to meet specific requirements of certain colleges.

Undergraduate Courses

223 Anatomy & Physiology of Livestock 4(3,3) S
General principles of anatomy and physiology are applied to all animals. Important species differences are described for the bovine, equine, porcine, ovine and aves.

403 Animal Diseases & Their Control 3(3,0) F
Diseases of livestock, poultry, and wildlife, with emphasis on sanitation, prevention and control. P, Micr 231.

Graduate Courses

590-690 Problems in Veterinary Science 1-3 as arranged FS
Consent of staff.

723 Advanced Systematic Physiology 4(3,3) F
725 Advanced Systematic Physiology 4(3,3) S
727 Endocrinology 4(3,3) F

Wildlife and Fisheries Sciences (WL)

College of Agriculture and Biological Sciences

Associate Professor Scalet, Head; Professor Linder; Associate Professors Applegate, Benda, Flake, Schitoskey; Assistant Professors Modde, Ratti, Wentz

The curriculum offers professional training 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 you for a variety of positions with state and federal agencies such as state conservation organizations, U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. National Park Service, U.S. Soil Conservation Service, U.S. Public Health Service, etc. Private industry employs biologists as biological consultants on environmental problems. By taking prescribed education courses you can obtain certification to teach biology in secondary schools.

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 Wildlife Research Unit, Cooperative Fishery 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	**F**		**S**
Fr Comp, Engl 101 or 191	3	or	3
Humanities elective	3	or	3
Intro to Sociology, Soc 100	3		
Intro Biology, Bio 151-153	3		3
Algebra & Trigonometry, Math 113	5		
Calculus for Non-Math Majors, Math 222			5
General Chemistry, Chem 112			4
Environmental Conservation, WL 210	2	or	2
Fitness & Lifetime Activities, PE 100	1		1
Sophomore Year	**F**		**S**
Principles of Ecology, Bio 211	3		
Elementary Organic Chemistry, Chem 120	4		

Macroeconomics Principles, Econ 201	3	
Elementary Physics, Phys 111-113	4	4
Elementary Biochemistry, Chem 260		4
Animal Kingdom, Zool 203		3
Fund of Speech, SpCm 101	3	
Junior Year	**F**	**S**
Junior Comp, Engl 300	3	
Mammalogy, Zool 355	3	
Ichthyology, WL 367*	3	
General Microbiology, Micr 231		4
Ornithology, WL 365*		4
Plant Taxonomy, Bot 261		4
Principles of Fisheries Management, WL 412*		3
Plant Ecology, Bot 415	4	
Electives	2	2
Senior Year	**F**	**S**
Principles of Wildlife Management, WL 411*	4	
Genetics, Bio 371	3	
Physiology elective, Bot 427 or Zool 325	4	
Communications Elective		2
Senior Seminar, WL 492	½	½
Statistics I, Stat 341	3	
Social Science elective		3
Humanities electives		3
Electives	1	8

* Field trips required in these courses may result in pro-rate charges to defray transportation costs.

This curriculum fits the needs of the average student. Where preparation for special fields is desired, substitutions may be made with the approval of the head of the department. For a more complete curriculum sheet, contact the department.

Undergraduate Courses

210 Environmental Conservation 2(2,0) FS
Ecological approach to conservation; man's past and present impact on world environments; wise use of natural resources, including soil, water, air, forests, rangelands, energy, wildlife and fisheries.

220 Introduction to Wildlife and Fisheries Management 2(2,0) F
An introduction to the basic principles used in the management of wildlife and fish populations. The course is directed towards the presentation of general concepts.

363 Ornithology 4(3,3) S*
Identification of game and non-game bird species; life histories, habits, and special structural and physiological adaptations of various groups. Introduction to the ecology of native and introduced game birds of North America.

367 Ichthyology 3(2,3) F*
Characteristics and relationships of fish and fish-life vertebrates; adaptations, modifications, and life histories of major groups; 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 population, and yield. Managing lakes, streams, and ponds for fish production. P, WL 367 or consent.

492 Senior 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. P, consent.

494 Internship/Cooperative Education/Field Experience 1-12, FSSu
Planned and supervised professional experience related to wildlife and fisheries conservation which takes place outside the formal classroom associated with federal, state, or private operations.

Graduate Courses

511-611 Limnology 4(2,6) S* (Offered in 1984)
Physical, chemical, and biological characteristics of lakes, ponds, and streams. Analysis of factors and processes that operate in fresh-water systems. Methods of measuring and evaluating these factors and processes. P, Chem 114; Phys 113; Biol 211; or consent.

513-613 Fisheries Science 3(2,3) F* (Offered in 1982)
Methods employed to evaluate and manage fish populations for sport and commercial fishing. Principles and techniques related to the following topics are included: fish population dynamics, population manipulation, habitat evaluation and management, fish propagation, evaluation and regulation of fish harvest. P, WL 367, 412; or consent.

515-615 Upland Game Management 3(2,3) S* (Offered in 1983)
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; consent.

517-617 Big Game Management 3(2,3) S* (Offered in 1984)
Big game animals life histories and field techniques for research and management. Recreational, economic, and aesthetic importance of big game species and domestic livestock. P, WL 411 and consent.

519-619 Waterfowl Management 3(2,3) F* (Offered in 1983)
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 and 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, non-game bird management, and other topics. Contact department head concerning planned special topics. P, graduate or senior undergraduate and consent.

591-691 Wildlife Research Problems 1-2 credits as arranged FSSu
Arrangements must be made with supervising staff member prior to registration. P, cumulative grade point average of at least 2.75 and permission of supervisor.

711 Aquatic Ecology 4(2,6) F* (1983)

713 Animal Population Dynamics 3(2,3) F (1982)

790 Thesis in Wildlife 5-7 credits FSSu

792 Graduate Seminar 1(1,0) FS

* Field trips required in these courses may result in pro-rata charges to defray transportation costs.

Women's Studies

Dr. Ruth Alexander, Coordinator, Department of English

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, politics, and women's relationship to sexuality. Particularly useful for students expecting to work with women in social work, counseling, nursing, business, education.

Women's Studies Minor

Required Courses

Course	Credit
Contemporary Health Problems HSc, 212	2
Marriage, Soc 250	2
Dynamics of Family Development, CDFR 342	2
Women in American Culture, Hum 213	3
Current Issues in Religion: Feminism & Theology, Rel 349	3
Seminar, Women & Politics, PolS 429	3

Woman Health Care Professions, Nurs 422	2

Elective Courses

You should consult with the coordinator of the program in selecting courses appropriate to your major from the following approved list:

Course	Credit
Seminar Women in the Labor Force, CGPS 592/692	3
Special Studies: Image of Women in Am. Lit, Engl 597/697	3
Course Special: Women in Foreign Language, MFL	3
Sociology of Sex Roles, Soc 497	3
American Women: Roles & Relationships, CDFR 594/694	3
American Lit. Seminar: Women Writers, Engl 594/694	3
Engl, Lit Seminar: Selected Engl. Women Writers, Engl 593/693	3
Biology and the American Woman, Bio 597/697	3

Personal Course Record

Course Title	C.N.	Dept.	Cr.	Course Title	C.N.	Dept.	Cr.

Campus Map

Administration/Offices/ Points of Interest

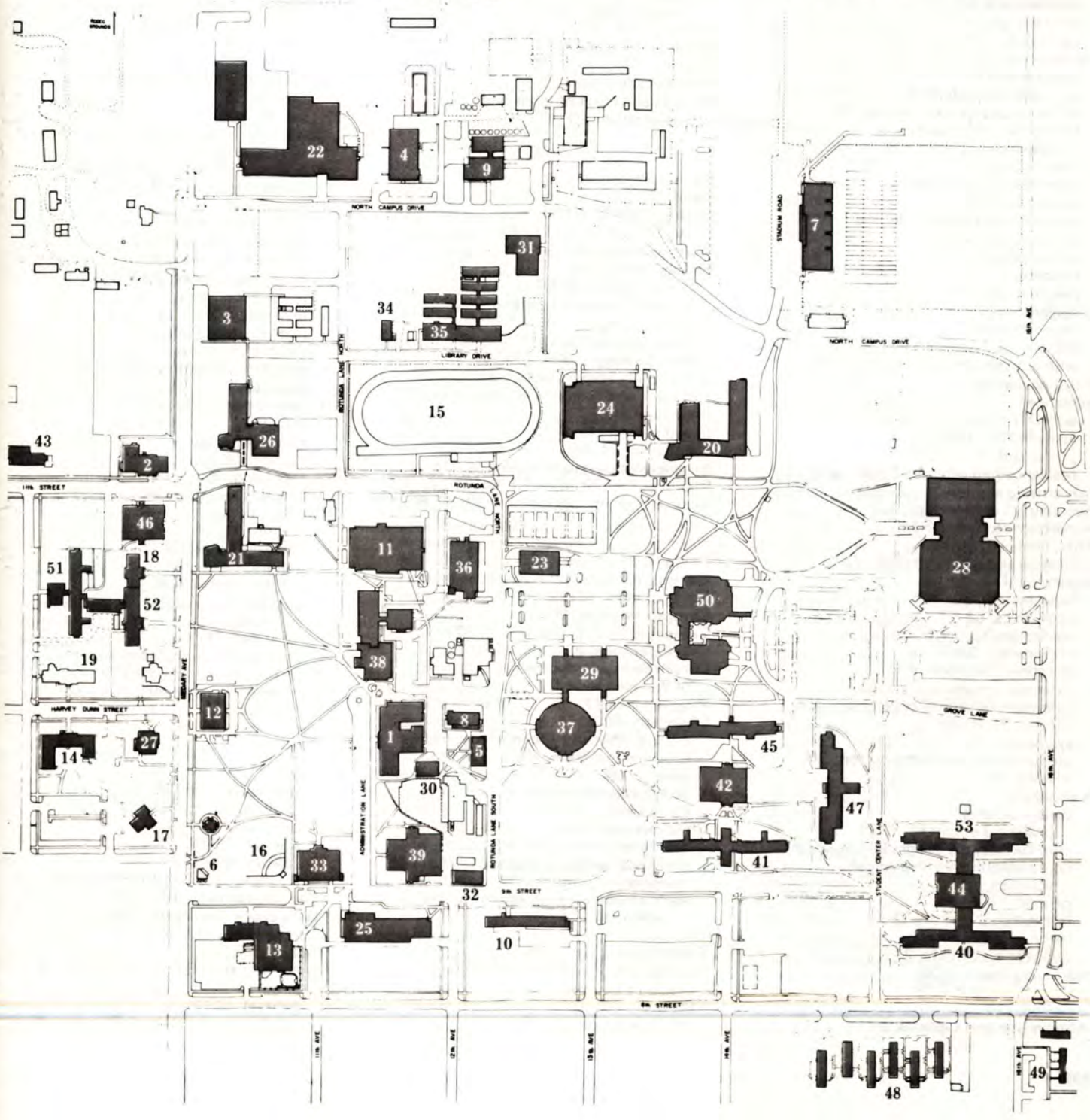
1. Administration Building
2. Agriculture Heritage Museum
3. Agronomy Seedhouse and Greenhouse
4. Animal Disease Research and Diagnostic
5. Communications Center
6. Coughlin Campanile
7. Coughlin-Alumni Stadium
8. Extension Building
9. Foundation Seed Stock Building
10. Harding Hall
11. Intramural
12. Memorial Art Center
13. Pugsley Continuing Education Center
14. Scobey Hall
15. Sexauer Field
16. Sylvan Theatre
17. Tompkins Alumni Center
18. Wenona Hall
19. West Hall

Classroom/Academic

20. Agricultural Engineering
21. Agricultural Hall
22. Animal Science Complex
23. Armory
24. Briggs Library
25. Crothers Engineering Hall
26. Dairy Microbiology
27. Family Management and Resource Center
28. Health, Physical Education and Recreation
29. Home Economics-Nursing
30. Horticulture
31. Horticulture-Forestry
32. Industrial Arts
33. Lincoln Music Hall
34. Physiology Laboratory
35. Plant Science Building
36. Printing and Journalism Building
37. Rotunda for Arts and Science
38. Shepard Hall-Pharmacy Addition
39. Solberg Hall

Residence Halls/Food Service

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



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University Staff

(as of January 1982)

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.

The above notation is not used with names of those whose duties are wholly in the field.

GENERAL ADMINISTRATION

Sherwood O. Berg, President, Graduate Faculty, 1975; B.S., SDSU, 1947; M.S., Cornell University, 1948; Ph.D., University of Minnesota, 1951.

Harold S. Bailey, Jr., Vice President for Academic Affairs, Professor of Pharmaceutical Chemistry, Graduate Faculty, 1951, 1976; B.S., Massachusetts College of Pharmacy, 1944; M.S., 1948; Ph.D., Purdue University, 1951.

Gary A. Thibodeau, Professor of Biology, Vice President for Administration, Director of Faculty Development, Grievance Officer, 1965, 1981; B.S., Creighton University, 1962; M.S., SDSU, 1967; M.S., 1970; Ph.D., 1971.

Barbara M. Audley, Director of Continuing Education/Community Service, Director of the Summer Session, 1978; B.A., California State University, 1974.

Wesley A. Bugg, Director of Finance, 1957, 1958; B.Ed., Western State University, 1942; B.S., Walton School of Commerce in Chicago, 1949.

Charles F. Cecil, Assistant to the President, Instructor in Journalism, 1965, 1976; B.S., SDSU, 1959; M.A., 1970.

Glen L. Carver, Director of the Physical Plant, 1978.

Harvey E. Johnson, Registrar, 1948, 1970; B.S., University of South Dakota, 1947; M.Ed., SDSU, 1970.

James O. Pedersen, Dean of Student Services, Professor of Education, 1957, 1970; B.S., SDSU, 1955; M.S., 1962; Ph.D., Purdue University, 1968.

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.

Robert T. Wagner, Professor of Rural Sociology, Assistant to the Vice President for Academic Affairs, Graduate Faculty, 1970, 1981; B.A., Augustana College, 1954; M.Div., Seabury Western Theological Seminary, 1957; M.Sac., 1970; Ph.D., SDSU, 1972.

ACADEMIC DEANS

Allen R. Barnes, Dean of Arts and Science, Professor of Foreign Languages, Graduate Faculty, 1961, 1967; B.A., Hastings College, 1948; M.A., University of Idaho, 1951; Ph.D., University of Madrid, 1953.

Delwyn Dearborn,* Dean of Agriculture and Biological Sciences, Professor of Animal Science, Graduate Faculty, 1971, 1974; B.S., SDSU, 1954; M.S., 1959; Ph.D., University of Nebraska, 1971.

Ardyce Gilbert, Dean of Home Economics, Professor of Home Economics Education, Graduate Faculty, 1966, 1977; B.S., SDSU, 1959; M.S., Iowa State University, 1966; Ph.D., 1974.

Raymond E. Hopponen, Dean and Professor of Pharmacy, Graduate Faculty, 1966; B.S., University of Minnesota, 1943; Ph.D., 1950.

Darrell Jensen, Dean of Education, Associate Professor of Education, Graduate Faculty, 1971, 1977; B.S., Northwest Missouri State University, 1959; M.A., Drake University, 1965; Ph.D., University of Iowa, 1971.

Arnold J. Menning, Dean of General Registration, Director of Preprofessional Program, Director of CAP, Associate Professor of Education, Graduate Faculty, 1969, 1979; B.A., University of Northern Iowa, 1952; M.A., 1956; Ph.D., SDSU, 1973.

Carol J. Peterson, Dean and Professor of Nursing, Graduate Faculty, 1977; Diploma in Nursing, Methodist Kahler School of Nursing, 1960; B.S., University of Minnesota, 1963; M.Ed., 1964; Ph.D., 1969.

Junis O. Storry,* Dean of Engineering, Professor of Electrical Engineering, Director of Engineering Experiment Station and Engineering Extension, Graduate Faculty, 1967, 1972; B.S., SDSU, 1942; M.S., 1949; Ph.D., Iowa State University, 1967.

Christopher P. Sword, Dean of the Graduate School, Director of Research, Professor of Microbiology, Graduate Faculty, 1976; B.S., Loyola University, 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, Extension Farm Management Specialist, Professor of Economics, Graduate Faculty, 1963, 1977; 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.

Sheila M. Agee, Assistant to Director of the Memorial Art Center, 1979; B.S., Bemidji State University, 1976; M.F.A., University of Oregon, 1979.

Cheryl L. Alber, Assistant in Horticulture, 1980; B.S., Central Michigan University, 1967.

***Robert E. Alber,** Assistant Professor of Journalism, 1980; B.S., Oregon State University, 1973; M.S., SDSU, 1980.

Ralph Alcock, Assistant Professor of Agricultural Engineering, 1981; Dip. Eng., Chelsea College, 1966; N.D.Ag.E., West Scotland Agricultural College, 1968; 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, 1962, 1981; B.A., Michigan State University, 1945; M.A., University of Minnesota, 1947; Ph.D., Michigan State University, 1952.

***Herbert R. Allen,** Professor of Economics, Graduate Faculty, 1967, 1977; B.S., Iowa State University, 1950; M.S., 1952; Ph.D., SDSU, 1968.

Edna Page Anderson, Professor and Head of Home Economics Education, Graduate Faculty, 1978; B.S., Winthrop College, 1963; M.S., 1966; Ph.D., Pennsylvania State University, 1976.

Joanne B. Anderson, Associate Professor of Nursing, 1981; B.S., SDSU, 1964; M.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.

Amazis S. Andrawis, Research Geologist, Remote Sensing Institute, 1976; B.S., Alexandra University, 1954; M.S., Internal Institute of Aerial Survey and Earth Sciences, 1970.

Earl R. Andresen, Associate Professor of Journalism, 1981; B.A., Columbia College, 1970; M.A., University of Illinois, 1972.

Susan K. Andrews, Adjunct Instructor in Chemistry, 1979; B.S., SDSU, 1971; M.S., University of Utah, 1976.

Robert J. Antonides, Extension Fiscal Officer, Associate Professor of Economics, Graduate Faculty, 1953, 1981; B.S., SDSU, 1947; M.S., 1953.

Richard L. Applegate, Adjunct Associate Professor of Wildlife and Fisheries Sciences, Graduate Faculty, 1967, 1975; B.S., Southern Illinois University, 1959; M.S., 1961; Ph.D., SDSU, 1974.

W. Eugene Arnold, Professor of Plant Science, Graduate Faculty, 1970, 1973; B.S., Oklahoma State University, 1965; Ph.D., North Dakota State University, 1970.

Kay S. Assam, Instructor in Nursing, 1981; B.A., Augustana College, 1978; M.A., University of South Dakota, 1980.

Richard L. Asscherick, Assistant Professor of Aerospace Studies, 1982; B.S., B.A., Ohio State University, 1976; M.B.A., University of Wyoming, 1979.

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, 1981; A.A., Oakland City College, 1963; B.S.N., California State University, 1973; Masters of Health Services, 1975.

Linda L. Baer, Instructor in Rural Sociology, 1980, 1981; B.A., Washington State University, 1971; M.A., Colorado State University, 1975.

Norman W. Baer, Assistant Professor of Horticulture, 1975, 1981; B.S., Washington State University, 1969; Ph.D., Colorado State University, 1975.

James H. Bailey, Extension Veterinarian, Associate Professor of Veterinary Science, 1968, 1973; D.V.M., Iowa State University, 1946.

Philip R. Baker, Associate Professor of Foreign Language, 1973, 1979; 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 of Microbiology and Dairy Science, Graduate Faculty, 1950, 1958; B.S., Iowa State University, 1942; M.S., 1947; Ph.D., 1950.

Emery Bartle, Associate Professor Emeritus of Dairy Science, 1944, 1971; B.S., SDSU, 1926; M.S., 1950.

Merritt W. Bates, Professor and Head of Foreign Languages, Coordinator of Latin American Area Studies, 1969, 1981; B.A., University of Americas, 1954; M.A., 1958; Ph.D., Universidad National De Rosaria, 1969.

Richard A. Battaglia, Program Leader ANR & RD, Professor of Animal Science, 1981; B.S., Southern Illinois University, 1966; M.S., Virginia Polytechnic Institute and State University, 1968; Ph.D., 1969.

Nancy J. Bauman, Assistant Cataloger, Instructor in Library, 1980; B.A., University of Wisconsin, 1973; M.A., 1976.

Donald O. Baumbach, Adjunct Research Chemist, 1981; B.S., Syracuse University, 1954; M.S., Pennsylvania State University, 1959; Ph.D., 1962.

***Patricia K. Beattie,** Associate Professor of Foreign Languages, 1968, 1977; B.S., SDSU, 1963; M.A., Middlebury College, 1964; A.B.D., University of Minnesota, 1977.

***Thomas A. Beattie,** Professor and Acting Head of Nutrition and Food Science, Coordinator of the Restaurant Management Program, 1973, 1980; B.S., Cornell University, 1950; M.Ed., University of Illinois, 1965.

Charles O. Bechtold, Assistant in Printing Production, 1956, 1968; B.S., SDSU, 1960.

Julie A. Bell, Assistant Professor of Home Economics Education, 1976, 1980; B.S., SDSU, 1970; M.S., 1976.

Robert L. Bell, Assistant State Supervisor of Agricultural Education, Adjunct Assistant Professor of Agricultural Education Special Programs, 1974, 1981; B.S., Iowa State University, 1962; M.S., 1970.

Rodney E. Bell, Professor and Head of History, Graduate Faculty, 1970, 1980; B.S., Jamestown College, 1955; M.A., University of Michigan, 1956; Ph.D., 1975.

Alan R. Bender, Instructor in Water Resources Institute, 1981; B.S., SDSU, 1966; M.S., 1980.

David A. Benfield, Assistant Professor of Veterinary Science, 1979; B.S., Purdue University, 1973; M.S., 1976; Ph.D., University of Missouri, 1979.

Larry F. Bennett, Professor of Mathematics and Computer Science, Graduate Faculty, 1970, 1980; B.S., University of Oklahoma, 1965; M.A., 1967; Ph.D., 1970.

Arpinee Berberian, Instructor in Music, 1968; B.A., Armenian Evangelical College, 1952; M.M., "Gomidas" National Conservatory of Music, 1964.

Hratch Berberian, Associate Professor of Music, 1967, 1970; Diploma, Cesar Franck School of Music, 1953; M.M., Boston Conservatory of Music, 1963.

Carol L. Bergan, Assistant in Nursing, 1978; B.S., Augustana College, 1970.

Martin E. Bergeland, Professor and Acting Head of Veterinary Science, Graduate Faculty, 1973; B.S., University of Minnesota, 1957; D.V.M., 1959; Ph.D., 1965.

Evelyn B. Bergh, Adjunct Instructor in Chemistry, 1979; B.S., University of Minnesota, 1942; M.S., 1963.

Timothy M. Bergquist, Captain USAF, Assistant Professor of Aerospace Studies, 1980; B.S., University of Portland, 1971; M.S., University of Southwestern Louisiana, 1973; M.B.A., University of Santa Clara, 1975.

Gerald E. Bergum, Professor of Mathematics, Graduate Faculty, 1970, 1977; B.S., University of Minnesota, 1958; M.S., University of Notre Dame, 1962; Ph.D., Washington State University, 1969.

***Wayne L. Berndt,** Extension Entomologist, Professor of Entomology and Plant Science, 1964, 1975; B.S., SDSU, 1950; M.S., Kansas State University, 1955; Ph.D., 1963.

Alice Berry, Associate Professor Emeritus of Art, 1966, 1979; B.S., Kansas State University, 1938; B.S., SDSU, 1966; M.S., Kansas State University, 1949.

Jan C. Bertholf, Captain, USA AROTC, Assistant Professor of Military Science, 1980; B.A., Texas A&M University, 1972.

Robert G. Best, Coordinator of Wildlife Applications Program, Remote Sensing Institute, 1975, 1981; B.S., SDSU, 1974; B.S., 1974; M.S., 1979.

Jean S. Bibby, Adjunct Clinical Instructor in Pharmacy, 1968; B.S., SDSU, 1947.

J. Billion, Adjunct Professor of Sports Medicine, 1981; B.S., Loras College, 1960; M.D., Stritch School of Medicine, 1965.

Joye A. Billow, Associate Professor of Pharmacy, 1972, 1978; B.S., Temple University, 1966; Ph.D., 1972.

John H. Bischoff, Assistant in Water Resources Institute, 1979; B.S., SDSU, 1977.

Ardell J. Bjugstad, Adjunct Professor of Wildlife & Fisheries Sciences, 1982; B.S., North Dakota State University, 1959; Ph.D., 1963.

Charles H. Blazey, Professor and Head of Health Science, Professor of HPER, Graduate Faculty, 1965, 1973; B.S., University of the State of New York, 1950; M.S., 1960; D.Ed., University of Oregon, 1971.

Audrey C. Block, Assistant in Nursing, 1982; B.S., SDSU, 1976.

Lowell C. Blome, Superintendent of Range Field Station, 1973; B.S., University of Nebraska, 1971.

Arvid A. Boe, Assistant Professor of Plant Science, 1976, 1979; B.A., Pacific Lutheran University, 1972; M.A., University of South Dakota, 1976; Ph.D., SDSU, 1979.

Richard Bohy, Adjunct Assistant Professor of Nursing, 1979; B.A., Nebraska Wesleyan University, 1963; M.A., 1968.

Joseph J. Bonnemann, Assistant Professor of Plant Science, 1955, 1971; B.S., SDSU, 1951; M.S., 1964.

James M. Booher, Associate Professor of HPER, Athletic Trainer, Graduate Faculty, 1967, 1977; B.A., Nebraska Wesleyan University, 1965; M.S., SDSU, 1969; Ph.D., University of Utah, 1976.

Deanna V. Boone, 4-H/Youth and Family Living Editor, Instructor in Extension, 1977; B.A., SDSU, 1972.

Loren J. Boone, University Editor, University Relations, 1974, 1975; B.A., SDSU, 1972.

Clare A. Borich, District Extension Supervisor, Assistant Professor of Extension, 1978; B.A., College of St. Catherine, 1967; M.S., University of Wisconsin, 1977.

Leslie Bork, Manager of Audio-Visual Center, Assistant Professor of Education, 1952, 1968; B.S., Northern State College, 1948; M.Ed., SDSU, 1957.

Donald E. Boyd, Assistant Professor of Art, 1974, 1981; B.F.A., Ohio State University, 1956; M.A.T., Harvard University, 1961; M.F.A., University of Iowa, 1966.

Billy G. Bradfeldt, Adjunct Clinical Instructor in Pharmacy, 1981; B.S., SDSU, 1970.

Burton L. Brage, Associate Dean of the College of Agriculture and Biological Sciences, Director of Resident Instruction, Professor of Plant Science, Graduate Faculty, 1950, 1974; B.S., University of Minnesota, 1946; Ph.D., 1950.

Marlene Brands, Instructor in Home Economics Education, 1978; B.S., SDSU, 1964; M.S., 1972.

Bruce E. Brandt, Assistant Professor of English, 1979; B.A., University of Denver, 1969; M.A., 1971; Ph.D., Harvard University, 1977.

Bernard J. Brandwein, Professor of Chemistry, Graduate Faculty, 1955, 1969; B.S., Purdue University, 1948; M.S., 1951; Ph.D., 1955.

Terry F. Branson, Adjunct Associate Professor of Plant Science, 1964, 1981; B.S., Colorado State University, 1957; M.S., 1964; Ph.D., SDSU, 1970.

Allen R. Branum, Professor and Head of Psychology, 1970, 1981; B.S., Montana State University, 1966; M.A., University of Montana, 1968; Ph.D., 1971.

***Judy R. Branum,** Instructor in CDFR, 1980; B.S., SDSU, 1975; M.S., 1977.

***Mary Brashier,** Information Specialist Publications, Assistant Professor of Experiment Station, 1973, 1979; B.S., University of Nebraska, 1958; M.S.T., Vassar College, 1967.

Hilton M. Briggs, President Emeritus, Distinguished Professor of Agriculture Emeritus, Graduate Faculty, 1958, 1976; B.S., Iowa State University, 1933; M.S., North Dakota State University, 1935; Ph.D., Cornell College, 1938; D.Sc., North Dakota State University, 1963.

***Robert A. Broschat,** Assistant Professor of Mathematics & Computer Science, 1966, 1974; B.S., Valley City State, 1960; M.S., North Dakota State University, 1962; M.S., University of Wisconsin, 1966.

Eleda P. Brotsky, Assistant in Nursing, 1966, 1978; B.S., SDSU, 1960.

Mary M. Brown, Professor of English, Graduate Faculty, 1955, 1979; B.A., Briar Cliff College, 1938; M.A., University of South Dakota, 1947; Ed.D., 1964.

Philip L. Brown, Public Services Librarian, Associate Professor of Library, 1974, 1980; B.A., Ohio State University, 1965; B.S., 1965; M.A., 1967; A.M.L.S., University of Michigan, 1971.

James D. Bruce, Associate Professor Emeritus of Electrical Engineering, 1960, 1974; B.S., Northern State College, 1936; M.A., University of South Dakota, 1942; B.S., Kansas State University, 1952; M.S., 1959; Ph.D., University of Missouri, 1968.

LeRoy B. Bruce, Extension Specialist Ruminant Nutrition, Assistant Professor of Animal Science, 1981; B.S., New Mexico State University, 1973; M.S., 1978; Ph.D., 1979.

Rebecca B. Bryan, Serials Librarian, Instructor in Library, 1981; B.A., Indiana University, 1974; A.M.L.S., 1976.

***Milo F. Bryn,** Associate Professor of Mathematics, 1962, 1976; B.S., North Dakota State University, 1954; M.S., 1959; M.A., University of Illinois, 1962.

George W. Buchenau, Professor of Plant Science, Graduate Faculty, 1959, 1980; B.S., New Mexico State University, 1954; M.S., 1955; Ph.D., Iowa State University, 1960.

David A. Bugg, Adjunct Clinical Instructor in Pharmacy, 1979; B.S., SDSU, 1973.

Wesley A. Bugg, Director of Finance, 1957, 1958; B.Ed., Western State University, 1942; B.S., Walton School of Commerce, 1949.

Conrad W. Burchill, Director of Personnel Services, 1964, 1976; B.S., North Dakota State University, 1951; M.Ed., SDSU, 1977.

***Robert S. Burke,** Professor of Psychology, 1971, 1981; B.A., Wheaton University, 1966; Ph.D., Baylor University, 1972.

Robert V. Burns, Professor of Political Science, Coordinator of South Dakota Government Internship Program, 1970, 1981; B.S., SDSU, 1964; M.A., University of Missouri, 1966; Ph.D., 1973.

Neal E. Busch, Assistant Professor of Chemistry, 1981; B.A., Drake University, 1964; Ph.D., Iowa State University, 1970.

***Leon F. Bush,** Associate Professor of Animal Science, Graduate Faculty, 1974, 1978; B.S., University of Kentucky, 1950; M.S., 1951; Ph.D., Cornell University, 1954.

Gergory C. Caldwell, Residence Hall Director, Student Housing, 1981; A.S., Virginia Western Community College, 1977; B.S., Eastern Kentucky University, 1979; M.S., 1981.

***Charles G. Carlson,** Assistant Professor of Plant Science, 1978, 1981; B.S., Western State University, 1969; M.S., SDSU, 1972.

Wendell C. Carlson, Professor of Animal Science, Leader of Poultry Research & Extension Section, Graduate Faculty, 1949, 1967; B.S., Colorado State University, 1942; M.S., Cornell University, 1948; Ph.D., 1949.

Martin L. Carson, Assistant Professor of Plant Science, 1980; B.S., Eastern Illinois University, 1975; M.S., University of Illinois, 1978; Ph.D., 1980.

Paul L. Carson, Professor of Plant Science, Graduate Faculty, 1948, 1969; B.S., Northwest Missouri State University, 1941; M.S., Iowa State University, 1947.

***Alan C. Carter,** Instructor in Electrical Engineering, 1977; B.S., SDSU, 1975.

Peter J. Cascella, Assistant Professor of Pharmacy, 1977; B.S., Wagner College, 1968; B.S., Temple University, 1971; Ph.D., University of Houston, 1977.

James A. Ceglian, Program Director, STATE, 1977; B.S., Purdue University, 1959.

Raymond Y. Chapman, Dean Emeritus of Student Personnel, 1942, 1975; B.A., Dakota Wesleyan University, 1926; M.A., University of South Dakota, 1931.

Gary S. Chappell, Associate Professor of Pharmacognosy, 1973, 1976; B.S., Ohio State University, 1963; Ph.D., University of Kansas, 1967.

Rosemary L. Chappell, Assistant in Nursing, 1977, 1980; B.S., Capital University, 1963.

Herbert E. Cheever, Jr., Professor and Head of Political Science, Graduate Faculty, 1968, 1978; B.S., SDSU, 1960; M.A., University of Iowa, 1962; Ph.D., 1967.

***Chen H. Chen,** Professor of Biology, Professor of Plant Science, Graduate Faculty, 1968, 1975; B.S., National Tiawan University, 1954; M.S., Louisiana State University, 1960; Ph.D., SDSU, 1964.

Douglas W. Chittick, Professor Emeritus of Rural Sociology, 1947, 1973; B.S., Northern State College, 1938; M.S., University of North Dakota, 1947.

Kenneth D. Christianson, Professor of Mechanical Engineering, Graduate Faculty, 1955, 1976; B.S., SDSU, 1949; M.S., 1958.

***Leslie L. Christianson,** Assistant Professor of Agricultural Engineering, Graduate Faculty, 1979; B.S., SDSU, 1973; M.S., 1976; Ph.D., University of Missouri, 1978.

Donald A. Christopherson, Adjunct Clinical Instructor in Pharmacy, 1978; B.S., SDSU, 1959.

Shu-Tung Chu, Professor of Agricultural Engineering, Graduate Faculty, 1967, 1981; B.S., National Tiawan University, 1956; M.S., University of Minnesota, 1960; Ph.D., 1966.

Ronald W. Church, Performance Facilities Revenue Centers Manager, 1980, 1981; B.S., SDSU, 1980.

***Carolyn L. Clague,** 4-H Youth Specialist, Assistant Professor of Extension, 1977, 1981; B.A., SDSU, 1974; M.Ed., 1975.

Andrew K. Clark, Assistant Professor of Dairy Science, 1980; B.S., Colorado State University, 1975; M.S., University of Delaware, 1978; Ph.D., North Carolina University, 1980.

Bill Cleaver, Adjunct Physical Therapy and Clinical Instructor, 1981; B.A., Franklin and Marshall College, 1968; Physical Therapy Certificate, University of Pennsylvania, 1973.

Charles C. Clever, Associate Professor of Mathematics and Computer Science, 1965, 1977; B.S., Grove City College, 1961; M.A., University of Kentucky, 1965.

***Kay S. Clever,** Assistant Director of Financial Aids, Computer Applications Officer, 1981; B.S., Grove City College, 1962; M.S., University of Kentucky, 1966.

***Dorothy J. Cline,** Associate Professor of Journalism, 1971, 1979; B.S., University of Colorado, 1940; M.S., SDSU, 1975.

Ralph A. Cline, Extension Agronomist Emeritus, 1949, 1973; B.S., Montana State University, 1930.

Janet G. Clites, Adjunct Assistant Professor of Nursing, 1972, 1979; B.S., Central Missouri State University, 1970; M.Ed., SDSU, 1974.

Leroy W. Cluever, Extension Agricultural Engineer, Instructor in Agricultural Engineering, 1975, 1977; B.S., University of Minnesota, 1970; M.S., 1976.

Zora Colburn, Professor Emeritus of Home Economics, 1955, 1977; B.S., SDSU, 1942; M.S., 1954.

Sharon K. Collier, Adjunct Instructor in Chemistry, 1979; B.S., Morningside College, 1964.

Floyd F. Collins, Emeritus Extension, 1922, 1956; B.S., Iowa State University, 1910.

Paul E. Collins, Professor of Horticulture, Graduate Faculty, 1951, 1974; B.A., Gustavus Adolphus, 1939; B.S., University of Minnesota, 1948; M.S., 1949; Ph.D., 1967.

John F. Colson, Associate Professor of Music, Director of Orchestra and Brass Activities, 1965, 1974; B.M., University of Iowa, 1955; M.A., 1956.

James P. Combs, Adjunct Assistant in Nursing, Certified Nurse Practitioner, Physician's Assistant Certified, Student Health, 1979, 1980; B.S., University of North Dakota, 1977.

Walter C. Conahan, Director of Development, 1978; B.S., SDSU, 1952.

***Keith W. Corbett,** Security Chief, Physical Plant, 1981; B.S., SDSU, 1976.

***Cordell E. Costar,** Grants Administrator, Business Office, 1973, 1978; B.S., SDSU, 1973.

William Costello, Associate Professor of Animal Science, 1965, 1976; B.S., North Dakota State University, 1954; M.S., Oklahoma State University, 1960; Ph.D., 1963.

***Kathie S. Courtney,** Adjunct Assistant Athletic Trainer, HPER, 1980; B.S., SDSU, 1974; M.S., Indiana State University, 1978.

Peggy L. Coyne, Assistant Professor of Nursing, 1979; B.S., SDSU, 1965; M.N., University of Washington, 1966.

Geraldine Crabbs, Professor Emeritus of HPER, 1953, 1976; B.S., University of Northern Iowa, 1933; M.S., University of Colorado, 1957.

David A. Crain, Associate Professor of History, 1973, 1978; A.B., Kansas State University, 1960; A.M., George Washington University, 1962; Ph.D., Indiana University, 1972.

***Francis W. Crandall,** Director of West River Center, Area Extension Livestock Specialist, 1956, 1970; B.S., SDSU, 1952.

Lynette M. Crissman, Assistant Reference Librarian, Instructor in Library, 1981; B.S., University of South Dakota, 1977; M.A., University of Denver, 1978.

Hall T. Cristman, Research Photo Scientist, Remote Sensing Institute, 1978; B.F.A., Rochester Institute of Technology, 1966.

***C. Bruce Crosswait,** Coordinator of West River Programs, Associate Professor of Education, Graduate Faculty, 1979, 1980; B.S., Black Hills State College, 1950; M.Ed., University of Wyoming, 1956; Ed.D., University of Kansas, 1967.

Mickey R. Cunningham, Major, USA AROTC, Assistant Professor of Military Science, 1981; M.S., Virginia Politechnic Institute, 1973.

***Merlyn M. Dahl,** Personnel Coordinator, District Extension Supervisor, Assistant Professor of Economics, 1961, 1977; B.S., SDSU, 1950; M.Ed., 1968.

Kevin J. Dalsted, Assistant Research Soil Scientist, Remote Sensing Institute, 1977; B.S., North Dakota State University, 1974; M.S., 1977.

Jerry M. Daugherty, Residence Hall Director, Student Housing, 1981; A.B., Indiana University, 1977; M.S., 1981.

James L. Davies, Residence Hall Director, Student Housing, 1980; B.A., University of Northern Iowa, 1979; M.A., 1980.

Randal D. Day, Assistant Professor of CDFR, Graduate Faculty, 1977; B.S., Brigham Young University, 1973; M.S., 1975; M.S., University of Wisconsin, 1975; Ph.D., Brigham Young University, 1977.

Darrell W. DeBoer, Professor of Agricultural Engineering, Graduate Faculty, 1969, 1978; B.S., Iowa State University, 1963; M.S., 1964; Ph.D., 1969.

***Delvin E. DeBoer,** Instructor in Civil Engineering, 1981; B.S., SDSU, 1978; M.S., 1980.

Kathleen M. DeDeyn, Instructor in HPER, Head Volleyball Coach (W), Head Tennis Coach, 1981; B.S., University of Northern Iowa, 1978; M.S., University of Arizona, 1979.

Dorothy E. Deethardt, Assistant Professor Emeritus of Food Research, 1955, 1972; B.S., SDSU, 1937; M.S., 1966.

Patricia DeGroot, Assistant in Nursing, 1980; B.A., Briar Cliff College, 1971; B.S.N., Creighton University, 1978.

Henry H. DeLong, Professor Emeritus of Agricultural Engineering, Graduate Faculty, 1930, 1973; B.S., SDSU, 1928; B.S., 1938; M.S., University of Minnesota, 1941.

Michelle L. Dennis, Residence Hall Director, Student Housing, 1981; B.S., Utah State University, 1978; M.S., 1981.

Clarence E. Denton, Professor of Speech, Graduate Faculty, 1956, 1977; B.S., University of Nebraska, 1950; M.A., Louisiana State University, 1954; M.F.A., University of Minnesota, 1965.

***Arthur W. Devor,** Professor of Chemistry, Director of Water Quality Lab, Water Resources Institute, 1980, 1981; B.S., McPherson College, 1935; M.S., Kansas State University, 1937; Ph.D., University of Southern California, 1947.

Mary E. DeVries, Associate Research Scientist, Remote Sensing Institute, 1972, 1978; B.S., SDSU, 1972.

***Robert M. Dimit,** Professor of Rural Sociology, Graduate Faculty, 1965; B.A., Pennsylvania State University, 1948; M.S., 1949; Ph.D., Iowa State University, 1954.

***Christian A. Dinkel,** Professor of Animal Science, Graduate Faculty, 1951, 1960; B.S., Iowa State University, 1948; M.S., SDSU, 1949; Ph.D., Iowa State University, 1953.

***Albert C. Dittman,** Research Associate of Agricultural Engineering, Rank IV, Manager of Redfield Station, 1946, 1971; B.S., SDSU, 1958.

***Thomas L. Dobbs,** Community Resource Development Specialist, Associate Professor of Economics, Coordinator of Title XII, Graduate Faculty, 1978; B.S., SDSU, 1965; Ph.D., University of Maryland, 1969.

Barbara A. Doherty, Assistant Professor of Nursing, 1973, 1976; B.A., College of St. Catherine, 1949; M.Ed., SDSU, 1973.

***James N. Dornbush,** Professor of Civil Engineering, Graduate Faculty, 1956, 1963; B.S., SDSU, 1949; M.S., University of Minnesota, 1959; D.Sc., Washington University, 1962.

***Arthur E. Dracy,** Professor Emeritus of Biological Engineering, Graduate Faculty, 1967, 1974; B.S., University of Minnesota, 1943; M.S., 1946; Ph.D., 1949.

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