AIMS OF THE DEPARTMENT

The objectives of the department are:

- to encourage the study of living organisms,
- to prepare biology majors in basic and advanced courses that provide a foundation for graduate study, teaching, and research in biology,
- to prepare pre-professional students in courses that satisfy entrance requirements for medical, dental, and veterinary medical school, and other professional programs,
- to prepare students anticipating careers in nursing and allied health fields,
- to prepare students seeking to fulfill general education lab science requirements, and
- to prepare students to respond intelligently to Creation/Evolution issues.

The department offers a Bachelor of Arts and a Bachelor of Science degree in biology. The B.A. degree requires 36 semester hours in biology and includes a foreign language component. The B.S. degree requires 44 semester hours in biology and emphasizes coursework in biology and the sciences. Required cognate courses are specified for each degree. The program has flexibility to allow students the choice of elective biology courses of special interest beyond the basic requirements listed below.

** The standard courses required for MCAT (Medical College Admission Test) & DAT (Dental Admission Test) preparation and for medical, dental and veterinary medical school entrance requirements.

** May be substituted by up to 2 hours of mentored internship.

PROGRAMS

Biology, B.A.

- BIOL 111, 112 General Biology ........................................ 8
- BIOL 230 General Ecology .............................................. 4
- BIOL 320 Genetics ........................................................... 4
- BIOL 419 Philosophy of Science ................................. 3
- BIOL 470 Field Natural History ....................................... 4
- BIOL 380 Research Methods ............................................ 2
- BIOL 340 Cell & Molecular Biology or
- BIOL 480** Elective from Group II or III ................... 3-4
- BIOL 481** Elective from Group I ........................................ 4
- BIOL 480** Research in Biology ...................................... 2-3
- BIOL 481 Senior Thesis ...................................................... 1

**  May be substituted by up to 2 hours of mentored internship.

TOTAL 36

Required Cognates: CHEM 111, 112; MATH 121.
Recommended Cognates: CHEM 331, 332.

Biology, B.S.

- BIOL 111, 112 General Biology* ..................................... 8
- BIOL 230 General Ecology .............................................. 4
- BIOL 320 Genetics ........................................................... 4
- BIOL 340 Cell & Molecular Biology ............................... 4
- BIOL 380 Research Methods ............................................ 2
- BIOL 419 Philosophy of Science ..................................... 3
- BIOL 470 Field Natural History ....................................... 4
- BIOL 480** Elective from Group I ........................................ 4
- BIOL 480** Elective from Group II ..................................... 3-4
- BIOL 480** Elective from Group III .................................... 4
- BIOL 480* Research in Biology ........................................ 2-3
- BIOL 481 Senior Thesis ...................................................... 1

** The standard courses required for MCAT (Medical College Admission Test) & DAT (Dental Admission Test) preparation and for medical, dental and veterinary medical school entrance requirements.

** May be substituted by up to 2 hours of mentored internship.

TOTAL 44

Required Cognates: CHEM 111*, 112*, 331*, 332*; PHYS 121*, 122*; MATH 121*.

PRE-PROFESSIONAL REQUIREMENTS

The entrance requirements for most medical, dental and veterinary medical schools are satisfied by the Biology B.S. degree and its cognate requirements of Chemistry, Physics and Math. Medical schools may require additional math and schools of veterinary medicine often have unique entrance requirements. The pre-professional student must choose a major from the list on page 34 and should consult with his/her pre-professional advisor to develop the best degree plan to satisfy specific pre-professional requirements.

TEACHING CERTIFICATION PROGRAM

The following Life Science major and minor are for teaching certification only. Requirements for certification are listed in the Education section of this bulletin.

You must make formal application for admittance to the Teacher Education Program. Applications are available at the Education Department office.

Life Science B.A. or B.S. - Secondary Teaching Area

The student must meet the requirements for a B.A. or B.S. degree in Biology.

Life Science Minor - Secondary Teaching Area

Option I

- BIOL 111, 112 General Biology ..................................... 8
- BIOL 230 General Ecology .............................................. 4
- BIOL 320 Genetics ........................................................... 4
- BIOL 419 Philosophy of Science ..................................... 3
- BIOL 480 Electives u.d. ................................................... 5

TOTAL 24
BIOLOGY COURSES

BIOL 101, 102  Anatomy & Physiology  4, 4 hours  An integrated two-semester study of the anatomy and physiology of human organ systems as well as cellular biology and fluid, electrolyte and acid-base balance. 3 Lec 3 Lab. Does not apply toward a Biology major nor minor.  (BIOL 101 Fall, BIOL 102 Spring)

BIOL 104, 105  Human Biology  4, 4 hours  A two-semester survey study of the human body including structure and function, life-span from conception to death, impact of disease processes and injury on the human body, and the interaction of humans with each other and with the environment. Discussion of the impact of healthful living on human physiology is a very important part of this course. This course is designed to meet the General Education Science requirement and does not apply toward a Biology major nor minor. 3 Lec 3 Lab.  (BIOL 104 Fall, BIOL 105 Spring)

BIOL 111, 112  General Biology  4, 4 hours  A two-semester course covering the basic disciplines of life science. General concepts in genetics, taxonomy, behavior, ecology, morphology, physiology and speciation of living organisms are taught. High school chemistry highly recommended. 3 Lec 3 Lab.  (BIOL 111 Fall, BIOL 112 Spring)

BIOL 220  Microbiology  4 hours  Prerequisite: BIOL 111, 112 or BIOL 101, 102  Introduction to the structure, function and control of microorganisms in the environment with special emphasis on those organisms of medical importance. Introduction to immune responses and mechanisms including antibody and host-antigen interactions, bursal and thymic influences on the lymphoid system, and humoral and cellular immunological response mechanisms. 3 Lec 3 Lab.  Lab fee.  (Fall)

BIOL 230  General Ecology  4 hours  Prerequisite: BIOL 111, 112  A general course including study of plant and animal distribution, ecological interactions and, observations of the delicate balance in nature. The laboratory includes a four-day field trip. 3 Lec 3 Lab.  Field trip fee.  (Fall)

BIOL 291  Selected Topics  1-3 hours  Prerequisite: BIOL 111, 112, and approval of instructor  A study in an area of student interest under the direction of a staff member. This study may involve data collection, or library work and will involve a written report. Content and method of study must be arranged prior to registration. May be repeated for a total of 3 credits.

BIOL 310  Invertebrate Zoology  4 hours  Prerequisite: BIOL 111, 112  A taxonomic and ecological study of invertebrates from marine, freshwater, and terrestrial environments. Considerable attention is focused on the direct role of invertebrates on human life. Laboratory includes a four-day field trip. 3 Lec 3 Lab.  Field trip fee.  (Offered periodically)

BIOL 312  Field Ornithology  3 hours  Prerequisite: BIOL 111, 112 or permission of instructor  A field study of native American birds, with emphasis on avian identification, geographical distribution, migration, habits and conservation. Laboratory includes a four-day field trip. 2 Lec 3 Lab.  Field trip fee.  (Spring)

BIOL 314  Systematic Botany  4 hours  Prerequisite: BIOL 111, 112  A taxonomic study of the flowering plants of Texas. Includes methods for identification and preservation of plant specimens. Laboratory includes a four-day field trip. 3 Lec 3 Lab.  Field trip fee.  (Spring, odd years)

BIOL 320  Genetics  4 hours  Prerequisite: BIOL 111, 112  The study of inheritance as it relates to man, animals and plants, including a detailed study of molecular genetics. Experimental work in laboratory involves both lower and higher organisms. 3 Lec 3 Lab.  (Spring)

BIOL 340  Cellular and Molecular Biology  4 hours  Prerequisite: BIOL 111, 112; CHEM 112  A study of the internal workings of the cell. The molecular basis of various cell activities is emphasized. Particular attention is paid to energetics, replication and synthesis, molecular transport and excitability of cells. Methods of molecular biology, including biomolecular engineering will be studied in the laboratory. 3 Lec 3 Lab.  (Fall)

BIOL 350  Developmental Biology  4 hours  Prerequisite: BIOL 111, 112  A study of vertebrate embryonic development from the formation of germ cells to the development of major organs and parturition. Reference is made to human developmental anatomy throughout the course. Laboratory includes microscopic study and experiments with sea urchin, frog, and chick embryos. 3 Lec 3 Lab.  (Spring, even years)

BIOL 360  Plant Dynamics  4 hours  Prerequisite: BIOL 111, 112 or permission of instructor  A broad course emphasizing the biological importance of plants in the world ecosystem as well as their direct vital role in human life. This is an applied botany course in which plant physiology, plant structure, ecology, and systematics are studied. Methods in experimental horticulture are examined. Laboratory includes a four-day field trip. 3 Lec 3 Lab.  Field trip fee.  (Spring, even years)

BIOL 380  Research Methods  2 hours  Prerequisite: BIOL 111, 112, or any entry level science sequence  A general introduction to the techniques and methodologies of scientific literature and presentations based upon library and on-line research. Each student will select a specific topic for research, prepare a paper, and make an oral presentation based on that work. The student will learn scientific methodology, basic statistical skills, and critical data analysis.  (Fall)

BIOL 419  Philosophy of Science  3 hours  A study of the philosophies and methodologies of science. Includes a review of the history of scientific and religious thought and the role each has played in the development of modern theories of origin. (Also taught as RLGN 419.)  This course meets the upper division writing component for senior year English.  (Spring)
Biology

BIOL 430  Entomology  4 hours
A study of the basic morphology, physiology, ethology and classification of insects and related arthropods. The topics include discussion of development and insect metamorphosis, insect ecology, treatment of applied entomology, and introduction to insects of medical and veterinary significance. Laboratory includes collecting techniques, preparatory techniques of museum specimens, and insect microscopy. 3 Lec 3 Lab. (Spring, odd years)

BIOL 440  Mammalogy  4 hours
Prerequisite: BIOL 111, 112
A systematic study of mammals with emphasis on natural history and ecology. 3 Lec 3 Lab. (Fall, odd years)

BIOL 450  Histology  4 hours
Prerequisite: BIOL 111, 112
An investigation of the structure and function of the tissues of the human body. The course is lab intensive and is intended to acquaint the student with the microscopic characteristics of tissues. 2 Lec 6 Lab. (Spring, even years)

BIOL 460  Animal Physiology  4 hours
Prerequisite: BIOL 111, 112; CHEM 111, 112
Emphasis will be placed on mammalian organ systems, but comparative aspects of each system and the interaction of environment and physiology will be discussed. 3 Lec 3 Lab. (Fall, even years)

BIOL 470  Field Natural History  4 hours
Prerequisite: BIOL 111, 112
An intensive advanced level course for students majoring in biology providing the opportunity for first-hand study of life forms in their natural setting. Includes field work in a region of high biological interest. Subjects covered may include ornithology, mammalogy, entomology, systematic botany, herpetology, paleontology, ecology, and marine biology. A student may also take up to two units of BIOL 491 with emphasis on a chosen taxon.
Student may apply to repeat for credit one time with approved research proposal. (Summer) Travel fee.

BIOL 480  Research in Biology  1-3 hours
Prerequisite: BIOL 380 and approval of instructor
A supervised research experience involving the development of a research proposal, data collection, and a written paper. Research proposal may be developed in BIOL 380. May be repeated for a total of 5 credits. (Offered periodically)

BIOL 481  Senior Thesis  1 hour
Prerequisite: BIOL 480
This course is designed to permit the student to develop a publishable-quality research paper. Instruction consists of writing techniques and guidance in the completion of the project. Students will give several oral progress-reports, a final presentation at the Biology Research Symposium, and a completed Senior Thesis. This course meets the upper division writing component for senior year English. (Spring)

BIOL 491  Selected Topics  1-3 hours
Prerequisite: BIOL 111, 112; two upper division courses; and permission of the instructor
Special study may be pursued beyond completed course work under the direction of a staff member. This study may involve data collection or library work and will involve a written report. Content and method of study must be arranged prior to registration. May be repeated for a total of 3 credits.