

make maximum use of the learning opportunities in the University and in helping them address academic problems.

ADMISSION REQUIREMENTS

See specific program descriptions for admission requirements for programs in the College of Arts and Sciences. Requirements for graduation vary from department to department; therefore, students must be certain to satisfy departmental requirements. Students are responsible for meeting all academic requirements for graduation.

UNIVERSITY STUDIES REQUIREMENTS

University Studies is comprised of (13 credit hours) of foundation courses and (12 credit hours) of theme-based “problem-solving” courses. Students will be expected to complete their foundation courses in the freshman year, before taking the theme-based courses.

In addition to the required University Studies courses, the College of Arts and Sciences also highly recommends that students enroll in the following courses which will further prepare students to enter the specialized programs of their university education, and to provide essential elements of higher education not necessarily included in the students’ specialties.

Accordingly, the College of Arts and Sciences highly recommends students to take the following to enhance academic general knowledge:

- I. 3 cr. hrs. of English 101 (English Composition) + UNST 110
- II. 3 cr. hrs. of Arts or Humanities (can be met through the University Studies Theme Clusters) (Arts or Humanities may consist of Visual Arts, Music, Theatre, Dance, English, and Philosophy).
- III. 3 cr. hrs. of Mathematics (can be met through the University Studies Theme Clusters)
- IV. 4 cr. hrs. of laboratory science (can be met through the University Studies Theme Clusters)
- V. 6 cr. hrs. of Foreign Languages

Certain courses require specific prerequisites and certain majors require specific courses; therefore, students should be knowledgeable of departmental requirements when planning their courses of study.

Students planning to enter teaching fields should also be knowledgeable about the semester hour requirements of these programs.

Students should also be aware that satisfactory advanced placement scores and/ or comparable experiential evidence may be used to satisfy some of the requirements for a baccalaureate degree. Students should consult the chairperson of their respective departments for information.

Department of Biology

<http://www.ncat.edu/~biology/>

Goldie Smith Byrd, Chairperson

Mary A. Smith, Associate Chairperson

OBJECTIVES

The objectives of the Biology Department are as follows:

1. to train professional biologists in the nature of scientific investigation, the principles of biology, and the value of scientific enterprise.
2. to prepare students for career opportunities in research, industry, and government.
3. to prepare students for graduate study in the biological sciences.
4. to prepare students for admission to professional schools (i.e. medical, dental, and veterinary school).
5. provide courses in biology that fulfill the general education core requirements of the University.
6. to provide cognate courses for students majoring in or receiving certification in other fields including, but not limited to, agricultural sciences, home economics, nursing, horticulture, and physical education.
7. to act as a resource to the University and community through cooperative programs, workshops, seminars, course offerings, and public service.
8. to conduct research and scholarly activity in the areas of biology, biotechnology, computational biology, and biology education.
9. to provide students with experience in the applications of computers in biological research.

DEGREES OFFERED

Biology – Bachelor of Science

Bachelor of Science in Secondary Education (Biology)

Biology – Master of Science*

Computational Science and Engineering – Master of Science*

Energy and Environmental Studies – Doctor of Philosophy*

* See the Graduate School Bulletin

Students interested in pursuing the Bachelor of Science degree in the Department of Biology are advised that rigorous high school preparation is important to success. The Department strongly recommends that a prospective student's preparation include 5 units of high school science (including units in biology, chemistry and physics) and at least 1 unit of mathematics beyond Algebra II.

GENERAL ADMISSION REQUIREMENTS

For Fall 2008, the admission of students to the undergraduate degree program in the Department of Biology are based upon the general admission requirements of the University. For students entering Spring 2009 and thereafter, to be admitted into the undergraduate degree programs of the Department of Biology incoming freshmen must meet all of the following requirements.

- ? English: Four course units emphasizing grammar, composition, and literature
- ? Foreign Language: Two course units in the same language
- ? Mathematics: Four course units including Algebra I, Algebra II, Geometry, and a higher level mathematics course for which Algebra II is a prerequisite
- ? Science: Three course units including at least one unit in a life or biological science, at least one unit in a physical science, and at least one laboratory course
- ? Social Science: Two course units including one in United States history
- ? A minimum SAT (math plus reading comprehension) combined score of 800 or an ACT composite score of 16
- ? A minimum high school grade point average of 2.5 (unweighted)

DEPARTMENTAL REQUIREMENTS

Biology (Pre-Professional) – Students are required to complete a minimum of 125 hours for graduation. This includes a minimum of 47 semester hours of biology and 40 semester hours of supporting math and science courses. The remaining courses satisfy other requirements of the Department and University.

Biology, Secondary Education – Students following the teacher education sequence are required to complete a minimum of 126 semester hours. Included in these 126 hours are a minimum of 33 semester hours of biology and 62 semester hours of supporting courses. The remaining courses satisfy the University's and School of Education's general education requirements.

Transfer students from other colleges and universities and from other disciplines at A&T must have a cumulative GPA of 2.5 or higher in all college work. All biology majors must maintain a cumulative GPA of 2.3 or higher. Any student whose GPA falls below 2.3 will be placed on probation at the end of that semester. If a student placed on probation does not raise his/her cumulative GPA to the minimum of 2.3 within two semesters he/she will be advised to change to another major. All biology majors must have a cumulative GPA of 2.3 or higher to qualify for graduation. Biology majors must earn a grade of "C" or higher in all biology courses. Any student earning a grade less than "C" must repeat the biology course.

ENRICHMENT PROGRAMS

Several enrichment programs and activities are available to students in the department, which are designed to increase the knowledge and competitiveness of biology majors. They include:

1. *Departmental Seminars* (including the Artis P. Graves Lecture Series and monthly departmental seminars). All students are encouraged to attend seminars presented by research scientists from industry, medical institutions, research laboratories and universities.
2. *Annual Life and Physical Sciences Research Symposium*. The Department of Biology sponsors an annual research symposium to provide a forum for students and faculty members to present their research in poster and oral formats. The symposium is designed to increase student awareness of research opportunities and to facilitate interactions between local students and faculty researchers with prominent scientists from other institutions including government, industry, and academia. This is a forum for faculty and students to present their research, an occasion for all science students to interact with prominent scientists from government, industry, or academia and become aware of research opportunities.
3. *Health Careers Opportunity Program*. This program is a collaborative effort with the University of North Carolina at Chapel Hill School of Medicine designed to increase the number of underrepresented disadvantaged students entering the health professions. It focuses on academic skills improvement, counseling, and mentoring and mentoring. **Advisors:** Dr. Perry Mack and Dr. Joseph Whittaker.
4. *Pre-Professional Biological Sciences Association*. The club includes a chartered Student National Dental Association and Student Medical Association Program. The formation of a National Black Graduate Student Association Chapter is underway. Activities include field trips, seminars, and community service, promotion of careers in health care and preparation for national entrance examinations to professional schools. **Advisors:** Dr. Perry Mack and Dr. Catherine White.

5. *Honor Societies.* Tau Phi Chapter of the Beta Beta Beta National Biological Honor Society. **Advisors:** Dr. Mary Smith and Dr. Catherine White. Beta Kappa Chi National Scientific Honor Society. **Advisor:** Dr. Claude Lamb (Chemistry Department)
6. **Retreats.** Hosts an annual **Faculty Strategic Planning Retreat**, an annual **Graduate Student Retreat**, and an **Annual New Student Orientation Program**.
7. *Biotechnology Certification.* Students are encouraged to seek intra- and extramural internships that provide hands-on exposure to laboratory techniques unique to biotechnology that would qualify them for research positions in research related to biotechnology **Coordinator: Minnie Holmes-McNary**
8. **Faculty/Student Advisement.** All biology majors have an assigned faculty advisor who will provide pin numbers, advice on course scheduling, career counseling, university resources, and personal issues that may affect academic performance. Students should schedule appointments to see advisors at least two times a semester.

ENRICHMENT FACILITIES

1. *Herbarium (NCATG).* A collection of approximately 6,000 specimens, several dozen of which were collected in the 1800's. NCATG is registered internationally.
2. *Computer Room.* This satellite computer center, located in Barnes Hines Hall, has 16-networked computers available for students. The room also houses printers and scanners for specific student needs.
3. *Research Laboratories.* The Department of Biology houses several state-of-the art research laboratories to support faculty and student research in molecular biology, biotechnology, microbiology, virology, ecology, and other biological sciences. In support of research, the Department has a suite with transmission and a scanning electron microscopes, an adjacent dark room, a cell tissue culture laboratory, plant growth chambers, a cold room and a greenhouse.
4. *Molecular Biology Research Core Lab.* This facility is equipped with high through-put technology including a Microarray Analyzer, CEQ 8800 Beckman Genetic Analyzer, 7500 Real Time PCR System, HPLC, 80 freezers, and an Amersham Flourimager 595 Pentium Workstation.
5. *Lecture Facilities.* The Teaching facilities include in the Department include a seminar room, auditorium, and a SMART Classroom equipped with and a video-conferencing capability for online communication center equipped with state-of-the art computer and audiovisual technology.
6. *Graduate Student Resource Room.* This facility provides space for graduate students to study, network, or relax.
7. *Undergraduate Research Training Center for Student Research Scholars.* This facility is equipped with computers, plasma screen, and video conference technology.

RESEARCH & EXTRAMURAL FUNDING

As is the standard in quality programs nationally, the department receives training and research support from Federal, State and private funding agencies to support its educational and research missions. Research areas in the department include:

- Biotechnology
- Cell & Molecular Biology
- Endocrinology/Biochemistry
- Developmental Biology
- Electron Microscopy
- Cancer Biology
- Bacteriology/Biochemistry Microbial Physiology & Genetics
- Virology/Immunology/Bioinformatics & Genomics
- Environmental Biology/Ecology
- Experimental Plant Taxonomy/Floristics
- Plant Physiology/Health Disparities

CAREER OPPORTUNITIES

Due to the depth of required courses in biology and the breadth of support courses in the quantitative sciences, languages, humanities, the arts and others, Biology majors qualify for employment in many fields. Highly motivated graduates in biology compete successfully for entry into graduate and professional schools. Research careers in government and industry as well as jobs in technical and pharmaceutical sales, biotechnology, environmental science, and teacher education are some of the career opportunities available to majors in biology.

REQUIRED MAJOR COURSES FOR BIOLOGY

BIOL 101	BIOL 260	BIOL 466
BIOL 160	BIOL 401	BIOL 501 (Capstone)
BIOL 221	BIOL 410	BIOL 561
BIOL 240	BIOL 462	

CURRICULUM GUIDE FOR BIOLOGY

FRESHMAN YEAR

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 101	4	BIOL 160	4
CHEM 106	3	CHEM 107	3