

## BIOLOGY (BI)

The Department of Biology sponsors majors leading to the Bachelor of Science degree and to the Bachelor of Science degree with teacher licensure (6-12). Biology and Marine Science minors also are offered. Structured to prepare students for research and technical areas requiring a baccalaureate degree, the biology major also is designed to satisfy most graduate and/or professional school admission requirements. The objective of the major is to provide the graduate with a comprehensive science education, encompassing standard academic courses in biology, chemistry, mathematics, and computer science. Courses and programs are structured to provide basic coursework applicable to (1) fields requiring a general preparation in biology, (2) graduate and professional programs, (3) medical and related health fields, and (4) secondary school teaching.

### **Bachelor of Science - Biology Major** **MAJOR CODE: 26.0101**

Program components for the Bachelor of Science degree with a major in Biology include:

#### 1. **APPLICABLE GENERAL UNIVERSITY REQUIREMENTS:**

##### **To graduate, each student must:**

- complete a minimum of 33 semester hours of the last 39 semester hours at ASU.
- complete 60 to 64 semester hours of upper level college/university credit (300-400 level courses).
- complete a minimum of 15 semester hours of upper (300/400) level coursework in his or her major at Athens State University, not including courses taken by consortium arrangement. School or departmental regulations may require more than 15 semester hours of coursework in the major at Athens State University.
- complete all course requirements for major(s).
- complete all course requirements for minor (if applicable).
- complete all of the general education requirements for the degree.
- attain an overall grade point average of 2.0, a 2.0 on all coursework attempted at Athens State University and at least a 2.0 in the major field. School or departmental regulations may require more than a 2.0 grade point average (see major requirements in each discipline).
- complete the total hour requirement as specified by the degree.
- complete the teacher certification requirements (if applicable).

***EACH STUDENT MUST ASSUME RESPONSIBILITY FOR KNOWING THE ACADEMIC REQUIREMENTS FOR THE DEGREE THAT IS BEING PURSUED.***

#### 2. **GENERAL EDUCATION REQUIREMENTS:**

**Area I. Written Composition** ..... 6 semester hours \_\_\_ \_\_

##### **Area II. Humanities/Fine Arts (12 semester hours)**

**At least one** fine arts course ..... 3 semester hours \_\_\_

**At least one** literature course ..... 3 semester hours \_\_\_

Other Humanities/Fine Arts courses ..... 6 semester hours \_\_\_ \_\_

##### **Area III. Mathematics and Natural Sciences (11 semester hours)**

Precalculus Algebra or higher ..... 3 semester hours \_\_\_

Principles of Biology I and II ..... 8 semester hours \_\_\_ \_\_

##### **Area IV. History/Behavioral and Social Sciences (12 semester hours)**

**At least one** history course ..... 3 semester hours \_\_\_

Other History/Behavioral or Social Science courses ..... 9 semester hours \_\_\_ \_\_ \_\_

**TOTAL GENERAL EDUCATION REQUIREMENTS ..... 41 SEMESTER HOURS**

3. **MAJOR PREREQUISITE COURSES (PRE-PROFESSIONAL):**

**The biology major must complete:**

College Chemistry I .....	4 semester hours	___
College Chemistry II .....	4 semester hours	___
Human Anatomy and Physiology I .....	4 semester hours	___
Elementary Statistics <u>or</u> Calculus I .....	3-4 semester hours	___
Fundamentals of Organic Chemistry <u>or</u> Organic Chemistry I .....	3-4 semester hours	___
CIS 146 Microcomputer Applications <u>or</u> CIS 301 Problem Solving with Computers .....	3 semester hours	___

**TOTAL MAJOR PREREQUISITE HOURS: ..... 21-23 SEMESTER HOURS**

**TOTAL GEN. ED. REQ. & MAJOR PREREQUISITE HOURS: ..... 60-64 SEMESTER HOURS**

4. **PROFESSIONAL COURSES:**

BI 301/BI 301L Cell Structure and Function .....	4 semester hours	___
BI 302/BI 302L Genetics .....	4 semester hours	___

A minimum of 22 semester credit hours from among the following biology courses:

BI 300/BI 300L Microbes and You .....	4 semester hours	___
BI 303/BI 303L General Ecology .....	4 semester hours	___
BI 311/BI 311L Biodiversity of North Alabama .....	4 semester hours	___
BI 321 Conservation Biology .....	3 semester hours	___
BI 322 Human Genetics .....	3 semester hours	___
BI 323 Human Reproduction .....	3 semester hours	___
BI 341 Biogeography .....	3 semester hours	___
BI 342/BI 342L Economic Botany .....	4 semester hours	___
BI 409 Biochemistry .....	3 semester hours	___
BI 411/BI 411L Invertebrate Systematics and Morphology <u>or</u> BI 412/BI 412L Invertebrate Development and Function .....	4 semester hours	___
BI 413/BI 413L Vertebrate Biology <u>or</u> BI 414/BI 414L Comparative Vertebrate Anatomy .....	4 semester hours	___
BI 415 Microbial Toxins and Human Health .....	3 semester hours	___
BI 420 Field Vertebrate Zoology I: Ichthyology and Herpetology .....	4 semester hours	___
BI 422 Field Vertebrate Zoology II: Ornithology and Mammalogy .....	4 semester hours	___
BI 423/BI 423L Histology .....	4 semester hours	___
BI 424/BI 424L Animal Physiology .....	4 semester hours	___
BI 425/BI 425L Embryology .....	4 semester hours	___
BI 427/BI 427L Parasitology .....	4 semester hours	___
BI 429/BI 429L Immunology .....	4 semester hours	___
BI 431/BI 431L Plant Systematics and Morphology <u>or</u> BI 433 Population Biology .....	4 semester hours	___
BI 440 Biotechnology .....	3 semester hours	___

**TOTAL PROFESSIONAL HOURS: ..... 30 SEMESTER HOURS**

5. The Biology major must complete a minimum of 18 semester hours of upper division biology coursework, at least 12 semester hours of which must be taken at Athens State University. Courses taken under the S.I.R. agreement do not constitute upper division coursework. The major who plans to attend graduate, medical, or other professional (e.g., veterinary, chiropractic, optometry, pharmacy) school, or who seeks special licensure or certification (e.g., physical therapist, wildlife biologist) should determine the specific recommendations or requirements of the particular school, licensing or certifying agency for science and mathematics coursework and complete the recommended or required coursework. A program of study tailored to meet specific recommendations and/or requirements for science and mathematics coursework then will be developed for the major in consultation with his or her Faculty Advisor. In general, the following courses or their equivalents frequently are recommended or required:

Calculus I, II (MA 303, 304)	Physics (PY 301, 302)
Organic Chemistry (CH 311, 312)	Biochemistry (BI 409 or CH 409)

6. A minor is required. .... 18 semester hours

7. **GENERAL ELECTIVES** ..... **16 semester hours** \_\_\_ \_\_\_ \_\_\_  
 8. **TOTAL HOURS FOR GRADUATION** ..... **126-128 SEMESTER HOURS**
9. **Pre-assessment and exit examinations:** To comply with Southern Association of Colleges and Schools (SACS) accreditation standards, the Department of Biology administers both pre-assessment and exit examinations to its majors. The examinations serve a four-fold purpose:
- (1) to assess preparedness for taking certain junior or senior level biology courses;
  - (2) to establish a benchmark for assessing knowledge gained as a result of completing the biology major at Athens State University;
  - (3) to assess preparedness for graduate study in biology or for admission to professional school; and
  - (4) to assess preparedness for a career as a biologist.

There is no cost for taking the examinations, nor is it necessary to undertake any special preparation for the examinations. The pre-assessment examination is designed to cover topics that usually are presented in an introductory biology sequence (e.g., a two semester sequence - Principles of Biology I, II) Exit examination questions are drawn from the following areas: Cellular Biology, Ecology (including Field Ecology), Genetics, Vascular and Non-vascular Botany, and Invertebrate and Vertebrate Zoology. The examinations are designed to be completed in 60 minutes. The pre-assessment examination is administered during the first term of attendance at Athens State University; the exit examination is administered during the term at the end of which the major expects to graduate.

### **BIOLOGY MINOR**

A minor requires completion of a minimum of 18 semester hours of biology coursework, including a minimum of 6 semester hours of upper division coursework which must be taken at Athens State University.

The minor must include the following courses or their approved equivalents:

- Principles of Biology I, II ..... 8 semester hours  
**TOTAL HOURS FOR MINOR** ..... **18 semester hours**

### **MARINE SCIENCE MINOR**

A Marine Science minor requires completion of 18 semester hours of marine science and/or biology coursework, at least 12 semester hours of which must be taken at Dauphin Island Sea Lab.

The minor must include the following courses or their approved equivalents:

- Principles of Biology I, II ..... 8 semester hours

### **MARINE ENVIRONMENTAL SCIENCES CONSORTIUM**

Athens State University is a member of the Marine Environmental Sciences Consortium, based at Dauphin Island, Alabama. This affiliation offers Athens State University students an opportunity to take courses and conduct research in estuarine and marine environments. Courses offered during the summer at Dauphin Island Sea Lab may be taken for credit at Athens State University toward a major or minor in biology or a minor in marine science. Some of the course offerings cannot be taken for biology major or minor credit. All programs of study that involve marine science courses must be approved by the MESC liaison. A Dauphin Island Sea Lab Information Bulletin listing summer school course offerings can be obtained early in the spring semester from a member of the Athens State University Department of Biology. Active courses of undergraduate instruction sponsored by the Consortium include the following:

- |                             |                                  |                           |
|-----------------------------|----------------------------------|---------------------------|
| Coastal Birds of Alabama    | Coral Reef Ecology               | Marine Technical Methods  |
| Marine Biology              | Oceanology of the Gulf of Mexico | Coastal Geomorphology     |
| Marine Invertebrate Zoology | Advanced Anatomy and Evolution   | Coastal Climatology       |
| Marine Botany               | of Marine Fishes                 | Marine Aquaculture        |
| Marine Geology              | Introduction to Neurobiology     | Coastal Zone Management   |
| Marine Ecology              | Marine Fish Diseases             | Dolphins and Whales       |
| Marine Vertebrate Zoology   | Introduction to Oceanography     | Marine Behavioral Ecology |

**Bachelor of Science - Biology Major**  
**(Licensure and Certification Track for Teaching in Secondary Education) (Grades 6-12)**  
**MAJOR CODE: 26.0101**

(Due to the No Child Left Behind Federal Act of 2001, the program listed below may have changed. See your advisor.)

**NOTE: To teach in secondary schools, the students MUST:**

- 1) complete the below listed requirements to include the minor for certification and licensure;
- 2) contact the certification officer in the College of Education for approval of appropriate professional education courses and compliance with NCLB Federal Act of 2001 and State Department of Education licensure standards;
- 3) maintain a grade point average of at least a 2.75 on a 4.0 scale in each of the following: professional education, teaching field, and overall education. This is a requirement for student teaching and for graduation.
- 4) repeat courses in which D's and F's are made and realize that all attempts are calculated in the GPA. Education courses with the prefixes ED, EL, ER, SC, SE, CE, and HPE may be repeated one time only; and
- 5) understand that underlined courses in the minor require admission into the Teacher Education Program (TEP).

**1. APPLICABLE GENERAL UNIVERSITY REQUIREMENTS:**

**To graduate, each student must:**

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- complete 60 to 64 semester hours of upper level college/university credit (300-400 level courses).
- complete a minimum of 15 semester hours of upper (300/400) level coursework in his or her major at Athens State University, not including courses taken by consortium arrangement. School or departmental regulations may require more than 15 semester hours of coursework in the major at Athens State University.
- complete all course requirements for major(s).
- complete all course requirements for minor (if applicable).
- complete all of the gen. ed. requirements for the degree.
- complete the total hour requirement as specified by the degree.
- complete the teacher certification requirements (if applicable).

***EACH STUDENT MUST ASSUME RESPONSIBILITY FOR KNOWING THE ACADEMIC REQUIREMENTS FOR THE DEGREE THAT IS BEING PURSUED. PLEASE FOLLOW CAREFULLY.***

**2. GENERAL EDUCATION REQUIREMENTS:**

**Area I.** Written Composition ..... 6 semester hours \_\_\_ \_\_\_

**Area II. Humanities and Fine Arts (12 semester hours)**

Fine Arts ..... 3 semester hours \_\_\_  
 Speech (SPH 106 or SPH 107) ..... 3 semester hours \_\_\_  
 Other Humanities/Fine Arts course ..... 3 semester hours \_\_\_  
 Literature\* ..... 3 semester hours \_\_\_ or 6 semester hours \_\_\_ \_\_\_

**Area III. Mathematics and Natural Sciences (11 semester hours)**

Precalculus Algebra or higher ..... 3 semester hours \_\_\_  
 Principles of Biology I and II ..... 8 semester hours \_\_\_ \_\_\_

**Area IV. History/Behavioral and Social Sciences (12 semester hours)**

History\* ..... 3 semester hours \_\_\_ or 6 semester hours \_\_\_ \_\_\_  
 General Psychology ..... 3 semester hours \_\_\_  
 Other History/Behavioral or Social Science elective ..... 3 semester hours \_\_\_

**\*Students must complete a 6 semester hour sequence either in Area II Literature or Area IV History.**

**TOTAL GENERAL EDUCATION REQUIREMENTS: ..... 41 SEMESTER HOURS**

3. **MAJOR PREREQUISITE COURSES (PRE-PROFESSIONAL)**

**The biology major must complete:**

College Chemistry I .....	4 semester hours	___
College Chemistry II .....	4 semester hours	___
Human Anatomy and Physiology I .....	4 semester hours	___
Elementary Statistics <u>or</u> Calculus I .....	3-4 semester hours	___
Fundamentals of Organic Chemistry <u>or</u> Organic Chemistry I .....	3-4 semester hours	___
Electives .....	3-5 semester hours	___

**TOTAL MAJOR PREREQUISITE HOURS: ..... 21-25 SEMESTER HOURS**

**TOTAL GEN. ED. REQ. AND MAJOR PREREQUISITE HOURS: ..... 62-66 SEMESTER HOURS**

4. **PROFESSIONAL COURSES:**

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**7. MINOR COURSES FOR CERTIFICATION:**

ED 301 Foundations of Education I .....	1 semester hour	___
ED 302 Foundations of Education II .....	2 semester hours	___
ED 305 Technology & Media in Education .....	3 semester hours	___
SC 331 Issues and Management in Secondary Education .....	3 semester hours	___
SC 333 <u>Teaching Reading/Writing in the Content Areas</u> .....	3 semester hours	___
SC 362 <u>Assessment and Evaluation in Secondary Education</u> .....	3 semester hours	___
PS 334 <u>Adolescent Psychology</u> .....	3 semester hours	___
SE 301 Introduction to Exceptional Learners .....	3 semester hours	___
BI 456 <u>Materials/Methods of Teaching Biology in the Middle School/ High School</u> .....	3 semester hours	___
SC 486 <u>Internship in High School Education</u> .....	9 semester hours	___ ___ ___

**TOTAL MINOR REQ. FOR LICENSURE/CERTIFICATION: .. 33 SEMESTER HOURS**

**TOTAL HOURS FOR GRADUATION ..... 125-129 SEMESTER HOURS**