MISSION

The biology program assists students in recognizing the significance of the biological sciences and in gaining proficiency in the use of the scientific method to solve problems through laboratory experiences.

The Program offers a course of study leading to the Bachelor of Arts or the Bachelor of Science degree in Biology.

REQUIREMENTS FOR A MAJOR IN BIOLOGY

1. A minimum of 41 semester hours in Biology.

- BIOL 1410 Organisms and Evolution 4 hours
- BIOL 1411 Botany 4 hours
- BIOL 2431 Cellular and Molecular Biology 4 hours
- BIOL 2430 Ecology and Behavior 4 hours
- BIOL 2101 Second Year Science Seminar 1 hour
- BIOL 3201 Field Biology 2 hours
- BIOL 3402 Vertebrate Physiology 4 hours
- BIOL 3101 Third Year Science Seminar 1 hour
- BIOL 3403 Genetics 4 hours
- BIOL 4101/4102 Senior Seminar (Fall and Spring) 2 hours
- BIOL 4201 Laboratory Management 2 hours
- BIOL 4302 Biological Internship or
- BIOL 4110-4410 Biological Research / Project 3 hours

and
- 2 Biology electives (upper division) 6-8 hours

2. A minimum of 3 hours of mathematics, MATH 2312 or higher.

3. CHEM 1411 and CHEM 1412, General Chemistry

4. Students seeking the Bachelor of Science degree must successfully complete MATH 2413 and MATH 2414, CHEM 2412 and CHEM 2422, and PHYS 2425 and PHYS 2426 as cognate electives.

5. Successful completion of the departmental exit examination. For students transferring from another college, please reference division requirements listed under the Department of Natural Sciences and Mathematics.

REQUIREMENTS FOR A MINOR IN BIOLOGY

1. A minimum of 21 semester hours including BIOL 1410, BIOL 2431, BIOL 2430, 1 hour of seminar (BIOL 2101 or BIOL 3101) and 8 credit hours in biology (4 hours must be upper division).

2. Successful completion of CHEM 1411, CHEM 1421 and MATH 1412 or higher.

3. Transfer students seeking a minor in biology must complete at least 10 semester hours in biology, including at least two semesters of biology Seminar while in residence at Huston-Tillotson University.
## A SUGGESTED COURSE SEQUENCE FOR THE BIOLOGY MAJOR

### YEAR 1

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<td><strong>FALL</strong></td>
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<td>UNIV 1201 or Freshman Orientation</td>
<td>BIOL 1411 General Botany 4</td>
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<td>RAMS 1201</td>
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<td>BIOD 1410 Organisms and Evolution</td>
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<td>MATH 1316 Trigonometry</td>
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<td>BIOD 2430 Ecology and Behavior</td>
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<td>BIOD 2101 2nd Year Seminar</td>
<td>Behavioral Science 3</td>
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<td>CHEM 1411 General Chemistry I</td>
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<td>CHEM 2422 Organic Chemistry II 4</td>
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<td>BIOD 4104 Senior Seminar Fall</td>
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<td>HIST 1302 U.S. History II</td>
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### COURSES IN BIOLOGY (BIOL)

**BIOL 1408 Introduction to Biology**  
4 Credit Hours

Non-majors are introduced to basic concepts in biology. Included are discussions of the scientific method, cellular organization, genetics, evolution, and diversity. Biology majors may only take this course as an elective. Three lecture hours and two laboratory hours per week.

Core Curriculum Science Requirement

Offered: Fall/Spring

**BIOL 1410 Organisms and Evolution**  
4 Credit Hours

This course is a survey course with discussions of organisms phylogenetically, including bacteria, protists, fungi, plants, and animals. This course is a prerequisite for all upper division biology courses. Non-majors must have consent of the instructor. Three lecture hours and three laboratory
hours per week.

**Prerequisite:** None

**BIOL 1411 General Botany**

Study of structure and function of plant cells, tissues, and organs. Includes an evolutionary survey and life histories of the following representative plant group: algae, fungi, mosses, liverworts, ferns, and seed producing organisms. Plant also includes reproductive and functional interactions with their environment and with humans. Three lecture hours and three laboratory hours per week.

**Prerequisite:** None

**Offered:** Fall/Yearly

**BIOL 2101 Second Year Science Seminar**

Seminars are presented by faculty, guest lecturers and students. Topics will address recent findings in the sciences or pertain to professional and career development of the science major. The course meets for a minimum of 1 hour weekly. Attendance, speaker evaluations and a presentation or paper is required for satisfactory completion of these science seminar courses.

**Prerequisites:** Biology major and 24 college credits

**Offered:** Fall/Spring/Yearly

**BIOL 2406 Environmental Biology**

Non-majors are introduced to basic ecological principles and the effects of humans on the environment. The course includes studies of populations, communities, ecosystems, energy flow, resources, pollution, waste management, and the effects of urbanization. Three lecture hours and two laboratory hours per week.

**Core Curriculum Science Requirement**

**Offered:** Fall/Spring

**BIOL 2407 Human Anatomy**

Examines the structure and organization of the human body. The laboratory includes dissection of a similar organism, the cat. This course is for biology, health science, teacher certification and kinesiology majors. Three lecture hours and two laboratory hours per week.

**Prerequisite:** None

**Offered:** Fall/Yearly

**BIOL 2408 Human Physiology**

Examines the function and operation of the human body. This course is for students in Kinesiology. Three lecture hours and two laboratory hours per week.

**Prerequisite:** BIOL 2407

**Offered:** Spring/Yearly

**BIOL 2430 Ecology and Behavior**

A study of the relationships between organisms and their external environment is made. Included are studies of physiological ecology, population dynamics, community structure, energy flow through ecosystems, and evolution. Three lecture hours and three laboratory hours per week. *This course is a writing intensive course.*

**Prerequisites:** BIOL 1410 or BIOL 1411

and MATH 1314 or MATH 1342

**Offered:** Fall/Yearly

**BIOL 2431 Cellular and Molecular Biology**

Included in this course are discussions of cellular organization, cell respiration and photosynthesis, and cell reproduction. This course is a prerequisite for all upper division Biology courses. Non-majors must have consent of the instructor. Three lecture hours and three laboratory hours per week.

**Prerequisites:** BIOL 1410 or BIOL 1411, and CHEM 1411

**Offered:** Fall/Yearly

**BIOL 3101 Third Year Science Seminar**

Seminars are presented by faculty, guest lecturers and students. Topics will address recent findings in...
the sciences or may be relative to professional and career development of the science major. The course meets for a minimum of 1 hour weekly. Attendance, speaker evaluations and a presentation or paper is required for satisfactory completion of these science seminar courses.

**Prerequisites:** Biology Major and 48 College Credits 

**Offered:** Fall/Spring Yearly

**BIOL 3201 Field Biology**  
2 Credit Hours

A study of ecological methods in terrestrial and aquatic systems is made, with an emphasis on quantitative and experimental procedures. This course may include at least 15 hours of service learning. Four laboratory hours per week.

**Prerequisites:** BIOL 1410, or BIOL 1411, and BIOL 2430 

**Offered:** Fall/Yearly

**BIOL 3301 Science Knowledge and Skills in Elementary Schools**  
3 Credit Hours

This course focuses on the concepts and skills needed to teach science in the elementary school. Topics addressed include the knowledge and skills from the Texas Essential Knowledge and Skills (TEKS) – the curriculum of Texas public schools. Students have the opportunity to observe and practice the pedagogy that they experience. A minimum of 20 hours of field experience is required of all students.

**Prerequisites:** BIOL 1410 or BIOL 1411 or BIOL 2430 or PHYS 1415 

**Offered:** Spring As Needed

**BIOL 3401 General Microbiology**  
4 Credit Hours

This course is a survey of bacteria and viruses with emphasis on medical, industrial, and immunological considerations. Three lecture hours and three laboratory hours per week.

**Prerequisites:** BIOL 2431 

**Offered:** Spring/Every Other Year

**BIOL 3402 Vertebrate Physiology**  
4 Credit Hours

This course is a study of the control of the internal environment with examples drawn from various vertebrates. This is a required course for biology majors. Three lecture hours and three laboratory hours per week. *This course is a writing intensive course.*

**Prerequisites:** BIOL 2431 and CHEM 1421 

**Offered:** Spring/Every two years

**BIOL 3403 Genetics**  
4 Credit Hours

An introduction to the principles of heredity at the molecular and cellular level is covered in this course. This is a required course for biology majors. Three lecture hours and three hours of laboratory each week.

**Prerequisites:** BIOL 2407 and CHEM 1421 

**Offered:** Spring as Needed  

(may be taken concurrently)

**BIOL 4101 and BIOL 4102 Biology Senior Seminar Fall/Spring**  
1/1 Credit Hour

Senior seminar courses are to be taken by all biology majors. The student attends one discussion hour per week and at least one science seminar participation hour per week. Oral discussion, a written report, and presentation on selected topics developed from information gathered from professional journals and reference books are required. In some cases, laboratory investigations with written reports may be substituted. Specific requirements for the satisfactory completion of this course are outlined in the course syllabi for each semester.

**Prerequisite:** Senior Standing 

**Offered:** Fall/Spring Yearly

**BIOL 4110 Biological Research/Project**  
1 Credit Hour

The student plans and implements an independent biological study using facilities available at Huston-Tillotson University or other sites if recommended by the biology faculty. If this course is taken to satisfy the major internship or research requirement, it must be taken for at least 3 credit
hours. Course may be repeated for a maximum of 10 credits.

**Prerequisite: Instructor approval**

**Offered: Fall/Spring Yearly**

**BIOL 4201 Laboratory Management**

2 Credit Hours

This course covers the preparation and management of laboratories for BIOL 1408, BIOL 1410, BIOL 1411, BIOL 2406 or BIOL 2431. One hour meeting with instructor and four laboratory (preparation) hours per week. Consent of instructor required.

**Prerequisites: BIOL 2430 or BIOL 2431 and senior status**

**Offered: Fall/Spring Yearly**

**BIOL 4210 Biological Research/Project**

2 Credit Hours

The student plans and implements an independent biological study using facilities available at Huston-Tillotson University or other sites if recommended by the biology faculty. If this course is taken to satisfy the major internship or research requirement, it must be taken for at least 3 credit hours. Course may be repeated for a maximum of 10 credits.

**Prerequisite: Instructor approval**

**Offered: Fall/Spring Yearly**

**BIOL 4301 Special Topics in Biology**

3 Credit Hours

This course will cover selected topics in biology of special interest to students and instructors. Topics may be a more in-depth treatment of survey courses or cover a specialty in biology. Course may include the background and current findings regarding a specific phyla, a life system, reproduction, botany, ecology molecular genetics, marine or freshwater biology, integrative or developmental biology, or neurobiology.

**Prerequisite: Instructor approval**

**Offered: As Needed**

**BIOL 4302 Biological Internship**

3 Credit Hours

An internship experience for majors in biology. Students work as interns in one of the areas of concentration. Students may not enroll in this course without prior department approval.

**Prerequisites: 12 biological major credits and advisor approval**

**Offered: Fall/Spring Yearly**

**BIOL 4310 Biological Research/Project**

3 Credit Hours

The student plans and implements an independent biological study using facilities available at Huston-Tillotson University or other sites if recommended by the biology faculty. If this course is taken to satisfy the major internship or research requirement, it must be taken for at least 3 credit hours. Course may be repeated for a maximum of 10 credits.

**Prerequisite: Instructor approval**

**Offered: Fall/Spring Yearly**

**BIOL 4410 Biological Research/Project**

4 Credit Hours

The student plans and implements an independent biological study using facilities available at Huston-Tillotson University or other sites if recommended by the biology faculty. If this course is taken to satisfy the major internship or research requirement, it must be taken for at least 3 credit hours. Course may be repeated for a maximum of 10 credits.

**Prerequisite: Instructor approval**

**Offered: Fall/Spring Yearly**

**CHEMISTRY (CHEM)**

**Mission**

Prepare students for careers in chemistry and chemistry related areas, such as health, environmental, and forensics, in the industry, government, and education sectors as well as