

BIOLOGY

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 and 2 Biology electives (upper division)	3 hours 6-8 hours
2. A minimum of 3 hours of mathematics, MATH 2312 or higher.
3. CHEM 1411-CHEM 1421, General Chemistry
4. Students seeking the Bachelor of Science degree must successfully complete MATH 2413 and MATH 2414, CHEM 2412-CHEM 2422, and PHYS 2425 - 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.

**Included as the core curriculum science requirement.*

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 1316 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

FALL		YEAR 1		SPRING	
BIOL 1410	Organisms and Evolution	4	BIOL 1411	General Botany	4
MATH 1316	Algebra and Trigonometry	3	MATH 2312	Pre-Calculus	3
ENGL 1301	Intro. College Composition	3	ENGL 1302	Composition and Research	3
COMM 1315	Public Speaking	3	KINE 1304	Health and Wellness	3
COSC 1300	Introduction to Computers	3	PSCI 1301	U.S Government	3
Total Hours		16	Total Hours		16

FALL		YEAR 2		SPRING	
BIOL 2430	Ecology and Behavior	4	BIOL 2431	Cellular and Molecular	4
BIOL 2101	2nd Year Seminar	1		Behavioral Science	3
CHEM 1411	General Chemistry I	4	CHEM 1421	General Chemistry II	4
MATH 2413	Calculus I	4	MATH 2414	Calculus II	4
KINE 1101	Personal Fitness	1	BIOL 3201	Field Biology	2
Total Hours		14	Total Hours		17

FALL		YEAR 3		SPRING	
BIOL 3101	3rd Year Seminar	1	BIOL 3402	Vertebrate Physiology	3
CHEM 2412	Organic Chemistry I	4	CHEM 2422	Organic Chemistry II	4
	Language I	3		Language 2	3
	Diversity Core I such as HIST 1381	3	ENGL 2331	World Literature	3
BIOL 3401	Microbiology	4		Diversity Core 2	3
Total Hours		15	Total Hours		16

FALL		YEAR 4		SPRING	
BIOL 3403	Genetics	4	BIOL 4301	Special Topics (elective)	3
BIOL 4104	Senior Seminar Fall	1	BIOL 4102	Senior Seminar Spring	1
BIOL 4201	Lab Management	2	BIOL 4302	Internship or	3/1
PHYS 2425	Physics I	4	BIOL 4110	Research	
HIST 1301	U.S. History I or	3	^PHYS 2426	Physics II	4
HIST 1302	U.S. History II		PHIL 2301	Philosophy and Ethics or	3
Fine Arts Core		3	RELI 2302	Comparative Religion	3
			BIOL	Elective	
Total Hours		17	Total Hours		17/15

^ Required courses for the Bachelor of Science Degree

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. **Prerequisite: None**
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, 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**Offered: Fall/Yearly****BIOL 1411 General Botany** **4 Credit Hours**

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 reproductive and functional interactions with their environment and with humans. Selected laboratory exercises.

Prerequisite: None**Offered: Spring/Yearly****BIOL 2101 Second Year Science Seminar** **1 Credit Hour**

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 24 college credits.**Offered: Fall/Yearly****BIOL 2406 Environmental Biology** **4 Credit Hours**

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.

Prerequisite: None**Offered: Fall/Spring****BIOL 2407 Human Anatomy** **4 Credit Hours**

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

Prerequisite: None**Offered: Fall/Spring/Yearly****BIOL 2408 Human Physiology** **4 Credit Hours**

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

Prerequisite: BIOL 2407**Offered: Fall/Spring/Yearly**

BIOL 2430 Ecology and Behavior

4 Credit Hours

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.

Prerequisites: BIOL 1410 or BIOL 1411

Offered: Fall/Yearly

BIOL 2431 Cellular and Molecular Biology

4 Credit Hours

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. This course is a writing intensive course. 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: Spring/Yearly

BIOL 3101 Third Year Science Seminar Fall/Spring

1 Credit Hours

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/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: Spring/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 to be addressed will be the knowledge and skills from the Texas Essential Knowledge and Skills (TEKS) – the curriculum of Texas public schools. Students will have the opportunity to observe and practice the pedagogy that they experience. A minimum of 20 hours of field experience will be required of all students.

**Prerequisites: BIOL 1410 or BIOL 1411
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: Fall/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.

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: Fall/Every Other Year (may be taken concurrently)**

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

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 2406, BIOL 1410, BIOL 1411, or BIOL 2431. One hour meeting with instructor and four laboratory (preparation) hours per week. Consent of instructor required.

Prerequisites: BIOL 2431 and BIOL 2430

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. They 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