

BIOLOGY, BACHELOR OF SCIENCE

Biology - Bachelor of Science

The major in biology provides course sequences leading to the Bachelor of Science degree in biology. The program prepares a student for professional careers and employment in biological sciences and teaching in the area of biology. The flexibility and design of the program aids in preparation for entrance into graduate, medical, pharmacy, and dental schools, as well as other professional schools. Students majoring in biology must complete a minimum of 32 hours in biology, including 2107K, 2108K, 3300K, 3101K, 3333K, 3501K, 4001, 4222 and 4701K. Additionally, the Biology major must complete a **minimum 13 hours of biology electives of which a minimum of eleven hours must be at the 3000/4000 level.** The electives will be chosen by the student with the advisor from a list of approved electives. Biology majors and minors must make a "C" or better in all biology, chemistry, physics, and mathematics courses. Students must meet the requirements of the Core Curriculum. Students must also take an Area Concentration Achievement Test (ACAT) in the biology field during the senior year.

Students interested in attending medical and dental schools choose from a select number of biology and chemistry courses and are advised by the Pre-Health advisor. Students desiring to opt for a concentration in biotechnology are advised to contact the biotech program coordinator or academic advisor. In addition to the biotech concentration and pre-med program, the biology degree program also offers additional tracks in Research, Bioenergy, Public Health, and Food safety. It is highly recommended for students to confer with their academic advisor or department chair prior to choosing courses.

Suggested Courses for the Biotech Concentration and Various Other Professional Tracks

1. Biotechnology concentration:

Students wishing to earn a concentration in biotechnology are required to take the following courses as part of their biology course sequence:

Code	Title	Semester Hours
BIOL 3000K	Fundamentals of Biotechnology	4
BIOL 3506	Bioinformatics	3
BIOL 3701	Current Issues and Topics in Biotechnology	2
BIOL 4703K	Genetic Engineering	4

Please note that satisfactory completion of these courses also fulfills the 13 hours of biology electives required for the major with no additional electives needed. Please note, the student's senior research project (required as a part of BIOL 4222K) must be related to the field of biotechnology. For detailed information discuss with biotech program coordinator.

2. Pre-Med Track (medical/dental/pharmacy):

Based on current admissions criteria for medical based professional programs, biology students interested in the pre-med track are advised to place emphasis on the following courses:

Code	Title	Semester Hours
Biology		
BIOL 2107K	Principles of Biology I (Required)	4

BIOL 2108K	Principles of Biology II (Required)	4
BIOL 3501K	Principles of Genetics (Required)	4
BIOL 4701K	Cell and Molecular Biology (Required)	4
BIOL 2411K	Human Anatomy/Physiology I or BIOL 2251K Anatomy and Physiology I	4
BIOL 2412K	Human Anatomy/Physiology II or BIOL 2252K Anatomy and Physiology II	4

Chemistry

CHEM 1211K	Principles of Chemistry I (Required)	4
CHEM 1212K	Principles of Chemistry II (Required)	4
CHEM 2301K	Organic Chemistry I (Required)	4
CHEM 2302K	Organic Chemistry II (Required)	4
CHEM 3250K	Biochemistry I (Required)	4

Physics

PHYS 1111K	Introductory Physics I (Required)	4
PHYS 1112K	Introductory Physics II (Required)	4

Due to the recent addition of behavioral and social sciences portions to the Medical College Admission Test (MCAT), students interested in **medical school** are also encouraged to take the following courses:

Code	Title	Semester Hours
PSYC 1101	General Psychology	3
SOCI 2031	Intro to Anthropology	3
SOCI 2282	Social Basis of Human Behavior	3

For further discussion contact pre-med advisor.

3. Graduate program/ Research track:

Students interested in this track are recommended to take the courses from this group.

Code	Title	Semester Hours
BIOL 2000K	Foundations of Research I	1
BIOL 2001K	Introduction to Research	2
BIOL 2240	Foundation of Research II	2
BIOL 2250	Responsible Conduct of Research	2
BIOL 2320K	Laboratory Research Techniques	3
BIOL 4001	Research and Independent Study I (Required)	1
BIOL 4222K	Biology Senior Research (Required)	3
BIOL 4223	Found of Research III	1

4. Bioenergy Track:

Biology students interested in the bioenergy track are recommended to take BIOL 2501 and BIOL 3103 as part of their biology course sequence. Please note that satisfactory completion of these courses may be used towards 13 hours of biology electives required for the major.

5. Public Health Track:

Biology students interested in the public health track are recommended to take BIOL 2330 and BIOL 3801 as part of their biology course sequence. Please note that satisfactory completion of these courses may be used towards 13 hours of biology electives required for the major.

6. Food Safety Track:

Biology students interested in the food safety track are recommended to take BIOL 2601 and BIOL 3201 as part of their biology course sequence. Please note that satisfactory completion

of these courses may be used towards 13 hours of biology electives required for the major.

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Students interested in attending medical and dental schools choose from a select number of biology and chemistry courses and are advised by the Pre-Health advisor. Students desiring to opt for a concentration in biotechnology are advised to contact the biotech program coordinator or academic advisor. In addition to the biotech concentration and pre-med program, the biology degree program also offers additional tracks in Research, Bioenergy, Public Health, and Food safety. It is highly recommended for students to confer with their academic advisor or department chair prior to choosing courses.

Code	Title	Semester Hours
Core Curriculum		
Core IMPACTS (https://catalog.asurams.edu/undergraduate/core-curriculum/#coreimpactstext) ⁸		42
Field of Study ¹		
BIOL 2107K	Principles of Biology I	4
BIOL 2108K	Principles of Biology II	4
PHYS 1111K	Introductory Physics I	4
PHYS 1112K	Introductory Physics II	4
BIOL 1801	Science Career Exploration	1
Major Requirements		
BIOL 3300K	General Botany I	4
BIOL 3101K	Environmental Biology	4
BIOL 3333K	Microbiology and Applications	4
BIOL 3501K	Principles of Genetics	4
BIOL 4001	Research and Independent Study I	1
BIOL 4222K	Biology Senior Research	3
BIOL 4701K	Cell and Molecular Biology	4
BIOL 3250K	Biochemistry	4
CHEM 2301K	Organic Chemistry I	4
CHEM 2302K	Organic Chemistry II	4
PHYS 2100	Computer Applications	3
or CSCI 1300	Introduction to Computer Science	

Biology Electives

Select 13 hours from the following courses (Required: 11 hours at the 3000/4000 level):

BIOL 2000K Foundations of Research I³

BIOL 2001K	Introduction to Research ³	
BIOL 2240	Foundation of Research II ³	
BIOL 2250	Responsible Conduct of Research ³	
BIOL 2320K	Laboratory Research Techniques ³	
BIOL 2330	Principles of Epidemiology ⁵	
BIOL 2411K	Human Anatomy/Physiology I ²	
or BIOL 2251K	Anatomy and Physiology I	
BIOL 2412K	Human Anatomy/Physiology II ²	
or BIOL 2252K	Anatomy and Physiology II	
BIOL 2501	Introduction to Biomass ⁴	
BIOL 2601	Intro to Foodborne Diseases ⁶	
BIOL 3000K	Fundamentals of Biotechnology	
BIOL 3103	The Fundamentals of Bioenergy ⁴	
BIOL 3201	Fund of Public Hlth Nutrition ⁶	
BIOL 3311K	Introduction to Natural Resources	
BIOL 3316K	Sources & Uses of Plant & Wildlife Resources	
BIOL 3320K	Principles and Techniques in Water Resource	
BIOL 3401K	Introduction to Histology	
BIOL 3506	Bioinformatics	
BIOL 3611K	Medical Mycology	
BIOL 3701	Current Issues and Topics in Biotechnology	
BIOL 3801	Env Hlth Conc in Public Hlth ⁵	
BIOL 3901	Pathophysiology	
BIOL 4101K	General Physiology	
BIOL 4201K	Introduction to Parasitology	
BIOL 4223	Found of Research III ³	
BIOL 4301K	Developmental Biology	
BIOL 4401K	Comparative Vertebrate Anatomy	
BIOL 4501K	Immunology	
BIOL 4601K	Plant Physiology	
BIOL 4703K	Genetic Engineering	

Non-Science Electives

Select any course other than a science course (NOTE: extra hours from Core IMPACTS STEM area can be applied to elective hours): 3

Foreign Language

SPAN 1001 Elementary Spanish I (Select any course other than a science course, NOTE: extra hours from Core IMPACTS STEM area can be applied to elective hours)) 3

First-Year and Wellness Course Requirements Outside the Core

ASU 1101 First Year Experience: Pathways to Success 1
HEDP, WELL Health & Wellness Requirement⁷ 2

Total Semester Hours 120

¹ A grade of C or better is required for the field of study.

² Courses for Pre-Med Track (medical/dental/pharmacy) concentration. These courses will satisfy Biology electives for B.S. in Biology.

³ Courses for graduate program/research track concentration. Students interested in this track are recommended to take courses from this group. These courses will satisfy Biology electives for B.S. in Biology (please note the credit-hour and course-level requirements in the elective section).

⁴ Courses for the Bioenergy concentration. These courses will satisfy Biology electives for B.S. in Biology.

⁵ Courses for the Public Health concentration. These courses will satisfy Biology electives for B.S. in Biology.

⁶ Courses for the Food Safety concentration. These courses will satisfy Biology electives for B.S. in Biology.

⁷ The health & wellness requirement may be fulfilled by taking one - two (2) credit hour health or wellness course OR two one (1) credit hour health or wellness activity courses.

⁸ Core IMPACTS: Students are advised to complete Pre-Calculus (MATH 1113) in the Mathematics Area and the Principles of Chemistry I (CHEM 1211K) and Principles of Chemistry II (CHEM 1212K) sequence in the STEM Area.

While students may choose among Core IMPACTS courses, selecting courses other than those recommended does not waive prerequisite requirements for major courses.

¹ Core IMPACTS: Students are advised to complete Pre-Calculus (MATH 1113) in the Mathematics Area and the Principles of Chemistry I (CHEM 1211K) and Principles of Chemistry II (CHEM 1212K) sequence in the STEM Area.

While students may choose among Core IMPACTS courses, selecting courses other than those recommended does not waive prerequisite requirements for major courses.

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BIOL 2108K	Principles of Biology II	4
PHYS 1111K	Introductory Physics I	4
PHYS 1112K	Introductory Physics II	4
BIOL 1801	Science Career Exploration	1
Major Requirements		
BIOL 3300K	General Botany I	4
BIOL 3101K	Environmental Biology	4
BIOL 3333K	Microbiology and Applications	4
BIOL 3501K	Principles of Genetics	4
BIOL 4001	Research and Independent Study I	1
BIOL 4222K	Biology Senior Research	3
BIOL 4701K	Cell and Molecular Biology	4
BIOL 3250K	Biochemistry	4
CHEM 2301K	Organic Chemistry I	4
CHEM 2302K	Organic Chemistry II	4
PHYS 2100	Computer Applications	3
or CSCI 1300	Introduction to Computer Science	
Biotechnology concentration		
BIOL 3000K	Fundamentals of Biotechnology	4
BIOL 3506	Bioinformatics	3
BIOL 3701	Current Issues and Topics in Biotechnology	2
BIOL 4703K	Genetic Engineering	4
Non-Science Electives		
Select any course other than a science course (NOTE: extra hours from Core IMPACTS STEM area can be applied to elective hours):		3
Foreign Language		
SPAN 1001 & SPAN 1002	Elementary Spanish I and Elementary Spanish II	6
First-Year and Wellness Course Requirements Outside the Core		
ASU 1101	First Year Experience: Pathways to Success	1
HEDP, WELL	Health & Wellness Requirement ³	2
Total Semester Hours		123