

# BIOLOGY, AREA OF CONCENTRATION IN ARTS & SCIENCES (AS)

**Award:** Associate of Science Degree

**No. of credits required:** 60

**For more information:** Contact Professor Tami Imbierowicz, 443-412-2122, timbierowicz@harford.edu; stem@harford.edu or Admissions, 443-412-2019, admissions@harford.edu.

## Program Description

This program offers biology students courses in natural and physical sciences in preparation for a wide array of career opportunities. Biological scientists study the origin, development, characteristics, and life processes of plant, microbial, and animal life and their relationships to the environment. They may conduct basic research aimed at increasing our knowledge of living organisms or applied research in medical and industrial settings. A major in the biological sciences is recommended for students interested in pursuing further study in biology, biotechnology and related fields, botany, zoology, microbiology, forestry, molecular and cellular biology, genetics, marine biology, high school biology teaching, and more. This program provides an excellent foundation for studies in pre-professional fields such as pre-medicine, pre-dentistry, pre-pharmacy, physical therapy, occupational therapy, and pre-veterinary sciences.

## Program Goals

Upon completion of the Associate of Sciences Degree, Area of Concentration in Arts and Sciences, Biology, the student will be able to:

1. Explain and apply the fundamental principles of biology.
2. Perform laboratory experiments and projects (collect, report and analyze data) by applying theoretical concepts and the scientific method.
3. Demonstrate safe laboratory skills.
4. Recognize and discuss the ethical issues in the discipline.
5. Locate, identify, evaluate and use scientific information effectively.
6. Apply computational skills in reasoning, estimation, problem-solving, and analysis.
7. Use appropriate grammatical forms in both oral and written formats to effectively communicate ideas and concepts.

## Transfer Information

This area of concentration is designed primarily to prepare students for transfer to baccalaureate programs in biology, life sciences, and pre-professional (medical/pharmacy). Students should check the degree requirements of their intended transfer institution(s) early in their academic program. If they significantly differ from those listed, students should consult an advisor for academic guidance.

## Employment Information

This program provides the first two years of a bachelor's degree in biology. Employment for those with a bachelor's or master's degree in biology is expected to continue to increase due to expanding opportunities in biotechnology research and development, molecular biology research, and medical professions. In addition, more biological

scientists are needed to conduct ever-expanding research on health and environmental issues.

## Degree Requirements

### Recommended Course Sequence

First Semester		Credits
BIO 120	General Biology I (GL)	4
CHEM 111	General Chemistry I (GL)	4
ENG 101	English Composition (GE)	3
Behavioral/Social Science Elective (GB) ( <a href="https://catalog.harford.edu/general-education/#behavioral-social-science">https://catalog.harford.edu/general-education/#behavioral-social-science</a> )		3
Physical Education Elective		1
<b>Credits</b>		<b>15</b>
Second Semester		
BIO 121	General Biology II (GL)	4
CHEM 112	General Chemistry II A (GL)	4
MATH 109 or MATH 203	Precalculus Mathematics (GM) or Calculus I (GM)	4
Arts/Humanities Elective (GAH)		3
<b>Credits</b>		<b>15</b>
Third Semester		
CHEM 207	Organic Chemistry I	4
Program Elective (p. 1) <sup>1</sup>		4
PHYS 101	Introductory Physics I (GL) <sup>1</sup>	4
BIO 208	Genetics	4
<b>Credits</b>		<b>16</b>
Fourth Semester		
CHEM 208	Organic Chemistry II	4
PHYS 102	Introductory Physics II (GL) <sup>1</sup>	4
Arts/Humanities Elective (GAH)		3
Behavioral/Social Science Elective (GB) ( <a href="https://catalog.harford.edu/general-education/#behavioral-social-science">https://catalog.harford.edu/general-education/#behavioral-social-science</a> )		3
<b>Credits</b>		<b>14</b>
<b>Total Credits</b>		<b>60</b>

<sup>1</sup> Students may elect to take PHYS 201 General Physics I: Mechanics (GL), PHYS 204 General Physics II: Heat, Electricity and Magnetism (GL) in place of PHYS 101 Introductory Physics I (GL) or PHYS 102 Introductory Physics II (GL) to meet transfer needs. If the student takes PHYS 204 General Physics II: Heat, Electricity and Magnetism (GL), Calculus II (MATH 204 Calculus II (GM)) must be taken as a program elective.

## Program Electives

(Select to complete 60 credits)

Code	Title	Credits
BIO 107	General Zoology <sup>F</sup>	4
BIO 110	Introduction to Plant Sciences (GL) <sup>F</sup>	4
BIO 191	Independent Study: Biology <sup>V</sup>	1
BIO 192	Independent Study: Biology <sup>V</sup>	2
BIO 193	Independent Study: Biology <sup>V</sup>	3

BIO 203	Anatomy and Physiology I (GL)	4
BIO 204	Anatomy and Physiology II (GL)	4
BIO 205	Microbiology (GL)	4
BIO 210	Nutrition (GS)	3
MATH 203	Calculus I (GM)	4
MATH 204	Calculus II (GM)	4
General Elective		1-4

F Usually offered in the fall.

V Course offerings vary by semester.

## General Education Degree Requirements

Note: The following codes identify courses which satisfy the General Education Degree Requirements:

Behavioral/Social Science (GB)

English Composition (GE)

Arts/Humanities (GAH)

Interdisciplinary and Emerging Issues (GI)

Biological/Physical Laboratory Science (GL)

Mathematics (GM)

Biological/Physical Science (GS)