

# ASSOCIATE OF SCIENCE WITH A CONCENTRATION IN BIOLOGY

The Associate of Science in Biology is based on the Ohio Guaranteed Transfer Pathway in Biology. It is recommended for students planning to start at Tri-C and transfer to a four-year institution to major in Biology. A four-year degree in Biology can prepare students for a variety of careers in a number of industries including entry-level positions in University Research labs, Government Research labs, Hospital/Medical labs, Zoos, and Secondary education (7-12 Teaching Licensure required). A Biology degree also serves as a strong foundation for students planning to go on to pursue graduate studies in biological sciences, medicine, dentistry, veterinary medicine, and physical therapy.

The Biology program at Cuyahoga Community College (Tri-C®) will provide students with the foundations in biology, chemistry, mathematics, scientific inquiry, essential laboratory skills, critical thinking, quantitative analysis, problem solving, and communication skills they need to succeed at their four-year institution.

It is important to note that some bachelor-degree granting programs may be competitive and admission into the program is not guaranteed. Students should check with individual institutions for their program admission requirements. In addition, some bachelor-degree granting institutions require additional general education courses outside of the Ohio Transfer Module and students may be required to take these courses in their junior or senior year. Students will still be able to follow this pathway and complete their bachelor's degree in approximately 60 additional credit hours.

**Program contact:** [Learn more](#)

## Program Admissions Requirements

- ENG-0995 Applied College Literacies or sufficient score on English Placement test to enroll in ENG-1010 College Composition I.
- MATH-0965 Intermediate Algebra or sufficient Math Placement score to enroll in MATH-1530 College Algebra or MATH-1580 Precalculus
- Sufficient score on Chemistry Placement Test to enroll in CHEM-1300 or CHEM-1010 with a grade of "C" or higher. All students pursuing this program need to take the Chemistry Placement Test to determine eligibility to enroll in CHEM-1300, which is a required course. CHEM-1010 is only required for students whose score on the Chemistry Placement test doesn't qualify for CHEM-1300.

## Program Outcomes

1. Apply the process of scientific inquiry to develop and explore questions about the natural world and effectively communicate the findings.
2. Analyze the diversity of life on Earth resulting from evolution.
3. Analyze the relationships and interactions between living things and their environment.
4. Relate concepts from mathematics and other science disciplines to the analysis of biological processes.
5. Demonstrate safe and proper use of experimental techniques and tools/instruments.

6. Utilize critical thinking, problem solving, quantitative analysis, and effective communication skills to be successful when transferring to a four year program in Biology and pursuing a career in the field of Biology.

MATH-1140, MATH-1141, MATH-1200, MATH-1270, and MATH-1280 can no longer count towards fulfilling the college-level mathematics requirement. These courses were re-classified as developmental mathematics by the state of Ohio in 2016. Tri-C established a 5-year transitioning window for students who had completed these courses prior to 2016 to apply them towards meeting graduation requirements, which expired in Summer 2021. It is highly recommended to see a counselor to determine the appropriate math required for your current major.

| First Semester               |   | Credit Hours |
|------------------------------|---|--------------|
| GEN-1070                     | First Year Success Seminar  | 1            |
| Select one of the following: |   | 3-7          |
| MATH-1410                    | Elementary Probability and Statistics I <sup>1</sup>                            |              |
| MATH-1580                    | Precalculus <sup>1</sup>  |              |
| MATH-1530                    | College Algebra & MATH-1540 and Trigonometry <sup>1</sup>                       |              |
| Select one of the following: |   | 4            |
| BIO-1500                     | Principles of Biology I   |              |
| BIO-150H                     | Honors Principles of Biology I  |              |
| Select one of the following: |   | 5            |
| CHEM-1300                    | General Chemistry I & CHEM-130L and General Chemistry Laboratory I <sup>2</sup> |              |
| CHEM-130H                    | Honors General Chemistry I  |              |
|                              |   | Credit Hours |
|                              |   | 13-17        |

| Second Semester              |  | Credit Hours |
|------------------------------|--|--------------|
| BIO-1510                     | Principles of Biology II   | 4            |
| Select one of the following: |  | 3            |
| ENG-1010                     | College Composition I  |              |
| ENG-101H                     | Honors College Composition I   |              |
| Select one of the following: |  | 5            |
| MATH-1610                    | Calculus I   |              |
| MATH-161H                    | Honors Calculus I  |              |
| Select one of the following: |  | 5            |
| CHEM-1310                    | General Chemistry II & CHEM-131L and General Chemistry Laboratory II |              |
| CHEM-131H                    | Honors General Chemistry II  |              |
|                              |  | Credit Hours |
|                              |  | 17           |

| Third Semester               |                                      | Credit Hours |
|------------------------------|--------------------------------------|--------------|
| CHEM-2300                    | Organic Chemistry I                  | 5            |
| Select one of the following: |                                      | 3            |
| COMM-101H                    | Honors Speech Communication          |              |
| COMM-1010                    | Fundamentals of Speech Communication |              |
| Select one of the following: |                                      | 3            |
| ENG-1020                     | College Composition II               |              |
| ENG-102H                     | Honors College Composition II        |              |
| Select one of the following: |                                      | 3            |
| PSY-1010                     | General Psychology                   |              |
| PSY-101H                     | Honors General Psychology            |              |

|   |       |
|---|-------|
| Select one of the following Arts and Humanities/Civic Responsibility courses: | 3     |
| HUM-1020 The Individual in Society  |       |
| HUM-102H Honors Individual in Society   |       |
| HUM-1030 The Individual in Cosmos   |       |
| PHIL-1000 Critical Thinking   |       |
| PHIL-2050 Bioethics   |       |
| Credit Hours  | 17    |
| <b>Fourth Semester</b>  |       |
| DEGR-XXXX Arts and Humanities Requirement <sup>4</sup>                        | 3     |
| Select two of the following:  | 7-8   |
| DEGR-XXXX Biology Elective (see below list)                                   |       |
| CHEM-2310 Organic Chemistry II <sup>3</sup>                                   |       |
| PHYS-1210 College Physics I <sup>4</sup>                                      |       |
| PHYS-2310 General Physics I <sup>4</sup>                                      |       |
| DEGR-XXXX Electives (see list below)  |       |
| Select one of the following:  | 3     |
| SOC-1010 Introductory Sociology   |       |
| SOC-101H Honors Introductory Sociology  |       |
| Credit Hours  | 13-14 |
| Total Credit Hours  | 60-65 |

- <sup>1</sup> Students who place into MATH-1610 Calculus I should take MATH-1410 Elementary Probability and Statistics I or MATH-1620 Calculus II to meet this requirement. Students who place lower than MATH-1610 Calculus I should take either MATH-1580 Precalculus or MATH-1530 College Algebra and MATH-1540 Trigonometry, based on Math Placement Score, as a prerequisite to MATH-1610 Calculus I. MATH-153H Honors College Algebra and MATH-154H Honors Trigonometry together will also be accepted to meet this requirement.
- <sup>2</sup> Students who do not achieve sufficient score on Chemistry Placement Test will need to take CHEM-1010 as a prerequisite to CHEM-1300. CHEM-1010 can be applied towards elective requirements if students need to take it as a prerequisite to CHEM-1300.
- <sup>3</sup> Students pursuing a Biology degree as Pre-medicine, Pre-dentistry, Pre-veterinary medicine, or a Clinical Laboratory track are required to take CHEM-2310 Organic Chemistry II
- <sup>4</sup> The Physics requirement for four-year Biology programs varies from institution to institution. Check with your planned transfer institution and program to determine whether or not to select a Physics course towards elective requirements.
- <sup>5</sup> Must be taken from a different discipline than course chosen to fulfill Arts and Humanities/Civic Responsibility Requirement.

## Recommended Electives

Students can select from a combination of courses to fulfill the elective credits. For example, these could be made up of two 5 credit courses, one 5 credit course and one 3 credit course, two 3 credit courses and a 4 credit course, two 4 credit courses, etc. The below courses are recommended to fulfill elective credits. You should select elective courses based on their planned program of study at their four-year institution.

| Code   | Title                               | Credit Hours |
|--|-------------------------------------|--------------|
| <b>Biology Electives</b>   |                                     |              |
| BIO-2060   | Principles of Genetics              | 3            |
| BIO-2150   | Environmental Science               | 3            |
| BIO-2500   | Microbiology                        | 4            |
| <b>Pre-Medicine, Pre-Dentistry, Pre-Veterinary Medicine, or Medical Laboratory Track</b> |                                     |              |
| CHEM-2310  | Organic Chemistry II                | 5            |
| <b>Education/Integrated Science (Seeking 7-12 Teaching Licensure)</b>                    |                                     |              |
| BIO-2150   | Environmental Science               | 3            |
| ESCI-1410  | Physical Geology                    | 4            |
| & ESCI-141L  | and Lab in Physical Geology         |              |
| or ESCI-141H   | Honors Physical Geology             |              |
| EDUC-1011  | Introduction to Education           | 3            |
| EDUC-1411  | Individuals with Exceptionalities   | 3            |
| PSY-2110   | Educational Psychology <sup>*</sup> | 3            |

\* Meets Social and Behavioral Science Requirements.