2+2 Articulation Agreement for Carroll Community College and Towson University

Associate's Degree: A.S. in Biology
Bachelor's Degree: B.S. in Molecular Biology, Biochemistry, & Bioinformatics (MB3), Molecular Biology Concentration
Effective Term: Fall 2019

Section 1: Course Completion Plan for Carroll CC

This section outlines the courses to take for the Carroll CC general education and program requirements in order to complete both Carroll CC and TU degrees within a total of 4 years and 120 credits. Refer to section 2 for specific course details and transfer planning information.

Table 1: General Education Courses Applied to TU Core Curriculum

Carroll CC Requirement	Carroll CC Course to Take	Credits	Towson University Equivalent Course
English Composition	ENGL 101 College Writing	3	ENGL 102 Writing for a Liberal Education
Mathematics	**Choose one course:** ▪ MATH 123 Precalculus 1 ▪ MATH 130 Precalculus	4-5	**Equivalency varies by course:** ▪ MATH 115 College Algebra ▪ MATH 119 Pre-calculus
Arts & Humanities	Any arts & humanities course.	3	Equivalency will vary by course.
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Social & Behavioral Sciences	Any social & behavioral science course.	3	Equivalency will vary by course.
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Biological & Physical Sciences	CHEM 105 Principles of General Chemistry 1	4	CHEM 131 & CHEM 131L General Chemistry I Lecture & Lab
Biological & Physical Sciences	BIOL 101 Fundamentals of Biology 1	4	BIOL 200 & BIOL 200L Intro Cell Biology & Genetics Lecture & Lab
English Literature	ENGL 102 Writing about Literature	3	ENGL TLL English Lower Level Elective
Program Requirement	BIOL 102 Fundamentals of Biology 2	4	BIOL 202 Intro to Ecology & Evolution

Total general education applied to the TU Core Curriculum: 34-35 credits

Students will transfer with a Core Package 3, which indicates that they must only complete the Advanced Writing Seminar (Core 9) and Ethical Perspectives (Core 14) requirements at TU. If a student takes an ethics course as an Arts & Humanities general education course, they will be required to complete another Core Curriculum requirement. The Towson Seminar (Core 1) requirement is waived for all incoming transfer students.

Table 2: Program Requirements and Electives Applied to TU Degree

Carroll CC Requirement	Carroll CC Course to Take	Credits	Towson University Equivalent Course
Program Requirement	BIOL 215 Microbiology	4	BIOL 215 Essentials of Microbiology
Program Requirement	BIOL 240 Genetics	4	BIOL T09 Genetics
Program Requirement	CHEM 106 Principles of General Chemistry 2	4	CHEM 132 & CHEM 132L General Chemistry II Lecture & Lab
Program Requirement	CHEM 201 Organic Chemistry 1	5	CHEM T31 Organic Chemistry I
Program Requirement	CHEM 202 Organic Chemistry 2	5	CHEM T32 Organic Chemistry II
Program Requirement	MATH 135 Calculus of a Single Variable 1	4	MATH 273 Calculus I

Total program requirements applied to the TU degree: 26 credits

Total transferred to TU: 60-61 credits

Students may transfer a maximum of 64 credits. If students do not adhere to the courses outlined above, they are not guaranteed completion of the bachelor's degree in 2 years.

Section 2: Carroll CC Course Selection Details

This section explains any specific course selections made in section 1 and provides transfer planning guidance specific to this degree plan. Students must follow the course selections outlined in this document. If students do not complete any or all of the courses outlined in this agreement, they will be required to complete outstanding requirements at TU.

COURSE AVAILABILITY

Certain courses at Carroll CC are only offered in the fall or spring term. Students must be mindful of course availability and plan accordingly to complete a course in fall or spring when it is offered. The Carroll CC catalog provides a recommended sequence of courses for students to follow based on course availability.

GENERAL EDUCATION

The program requirement BIOL 102 is counted toward the total of general education credits completed at Carroll CC. This enables TU to apply a core package and recognize the completion of the associate's degree's general education requirements without course-by-course placement in the Core Curriculum.

PROGRAM REQUIREMENTS

For the **required math course**, students must take **MATH 135 Calculus of a Single Variable 1** to satisfy the MB3 major's requirement for MATH 273 Calculus I.

LOWER-LEVEL EQUIVALENTS OF UPPER-LEVEL COURSES

A course number beginning with T indicates that it is a lower-level equivalent of an upper-level TU course. CHEM T31, CHEM T32, and BIOL T09 satisfy major requirements but do not count toward the TU degree requirement for 32 upper-level units.

Section 3: Degree Requirements to Be Completed at TU

This section outlines the remaining degree requirements for students transferring into the Molecular Biology concentration. The concentration examines the molecular basis of life, uses molecular approaches to understand the processes of living systems, and has applications in all areas of biology. Refer to section 4 for university-wide degree requirements.

CORE CURRICULUM REQUIREMENTS: 6 UNITS

Core 9 Advanced Writing Seminar
Core 14 Ethical Perspectives

MB3 MAJOR REQUIRED COURSES: 23 UNITS

BIOL 409 Molecular Biology (4 units)
CHEM 351 Biochemistry I (3 units)
MATH 237 Elementary Biostatistics (4 units)
Select one of the following for 4 units:

- MBBB 201 Programming for Biologists
- COSC 175 General Computer Science

MBBB 301 Intro to Bioinformatics (4 units)
MBBB 493 Seminar in Bioethics (1 unit)
Select one of the following for 3 units:

- MBBB 495 Capstone Project in MBBB
- BIOL 491 Elective in Independent Research
- CHEM 491 Research in Chemistry
- COSC 495 Independent Study
- An approved upper-level elective in BIOL, CHEM, COSC, CIS, or MBBB

MOLECULAR BIOLOGY CONCENTRATION COURSES: 17-18 UNITS

BIOL 408 Cell Biology (4 units)
Select one of the following for 2 units:

- BIOL 312 Genetics Laboratory
- BIOL 410 Molecular Biology Laboratory
- BIOL 412 Cell Biology Laboratory

PHYS 211 General Physics I Non Calculus-Based (4 units)
PHYS 212 General Physics II Non Calculus-Based (4 units)
Upper-level Biology Elective (3-4 units)

GENERAL ELECTIVES: 12-14 UNITS

The number of elective units required to meet the minimum 120 units will be determined by the total units taken at Carroll CC and within the major at TU. Electives may include additional major electives or courses of personal interest.

Section 4: Additional Requirements for TU Degree Completion

BACHELOR'S DEGREE REQUIREMENTS FOR ALL STUDENTS:

- A C (2.0) or higher is required in all major courses and prerequisites.
- A cumulative grade point average (GPA) of 2.0 is required.
- 32 units of the bachelor's degree must be completed at the upper level (courses numbered 300 or above).

Degree Completion Summary

Total Units Required for B.S. Degree	**120 UNITS**
Carroll CC A.S. Degree in Biology	**60-61**
Completion of Core Curriculum at TU	**6**
MB3 Major – Molecular Biology Concentration Coursework Taken at TU	**40-41**
General Electives Taken at TU	**12-14**