ACCELERATED DUAL-DEGREE BS IN BIOLOGY/MS IN MOLECULAR AND CELL BIOLOGY (3+1)

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For highly qualified students, the Accelerated Dual-Degree BS in Biology/MS in Molecular and Cell Biology (3+1) provides an opportunity for students to achieve both a Bachelor of Science in Biology and a Master of Science within the field of Molecular and Cell Biology within a 4-year time frame typically associated with only an undergraduate education. The 3+1 program provides an excellent foundation for students intending to pursue studies in professional healthcare fields and doctoral programs. It also offers a competitive edge for students wishing to pursue a career in biotechnology and biopharmaceutical industries.

The requirements and policies for the undergraduate degree are the same as described on the Bachelor of Science in Biology (http://catalog.qu.edu/arts-sciences/biological-sciences/biology-bs/) page, except that students in the 3+1 combined BS/MS program are expected to maintain a GPA of at least 3.00 at the end of each school year for continued participation in the program. The requirements and policies for the graduate degree are the same as described on the Master of Science in Molecular and Cell Biology (http://catalog.qu.edu/graduate-studies/arts-sciences/molecular-cell-biology-ms/) page.

Students in the 3+1 accelerated dual degree program in biology/MCB must meet the following requirements. The minimum number of credits required for a Bachelor of Science degree is 120. The minimum number of credits required for a Master of Science in molecular and cell biology is 34.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 150 &amp; 150L</td>
<td>General Biology for Majors and General Biology for Majors Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>BIO 151 &amp; 151L</td>
<td>Molecular and Cell Biology and Genetics and Molecular and Cell Biology and Genetics Lab</td>
<td>4</td>
</tr>
<tr>
<td>BIO 252 &amp; 252L</td>
<td>Ecology and Biodiversity and Ecology and Biodiversity Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>BIO 298</td>
<td>Research Methods in Biology</td>
<td>3</td>
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</tbody>
</table>

Biology Electives ¹

Select a minimum of one course from each of the following categories:

**Molecular and Cellular Electives (3-4 credits):** ¹

- BIO 240: Cellular Communication
- BIO 282: Genetics and Genetics Lab
- BIO 317: Developmental Biology and Developmental Biology Lab
- BIO 346 & 346L: Cell Physiology and Cell Physiology Lab
- BIO 365: Cancer Biology
- BIO 382 & 382L: Human Genetics and Human Genetics Lab
- BIO 471 & 471L: Molecular Genetics and Molecular Genetics Lab
- BIO 323 & 323L: Invertebrate Zoology and Invertebrate Zoology Lab
- BIO 324 & 324L: Vertebrate Zoology and Vertebrate Zoology Lab
- BIO 328 & 328L: Human Clinical Parasitology and Human Clinical Parasitology Lab
- BIO 352 & 352L: Botany and Botany Lab
- BIO 358 & 358L: Conservation Biology and Conservation Biology Lab
- BIO 375 & 375L: Physiological Models for Human Disease and Physiological Models for Human Disease Lab
- BIO 383: Evolution

**Physiology Electives (3-4 credits):** ¹

- BIO 211 & 211L: Human Anatomy and Physiology I and Human Anatomy and Physiology Lab I
- BIO 212 & 212L: Human Anatomy and Physiology II and Human Anatomy and Physiology II Lab
- BIO 225 & 225L: Physiological Diversity and Physiological Diversity Lab
- BIO 329: Neurobiology
- BIO 350: Cardiovascular Physiology

**Experiential Learning (1-4 credits):**

- BIO 385: Explorations in Biology
- BIO 491: Independent Research in Biological Science
- BIO 492: Independent Research in Biological Sciences
- BIO 493: Independent Research in Biological Sciences
- BIO 494: Independent Research in Biological Sciences

**Physical Science Core Requirements**

- CHE 110 & 110L: General Chemistry I and General Chemistry I Lab
- CHE 111 & 111L: General Chemistry II and General Chemistry II Lab
- CHE 210 & 210L: Organic Chemistry I and Organic Chemistry I Lab
- CHE 211 & 211L: Organic Chemistry II and Organic Chemistry II Lab
The senior year as possible, and arrange to have first quarter grades sent from their high school counselor as soon as they are available.

For detailed admission requirements, including required documents, please visit the Admissions (http://catalog.qu.edu/general-information/admissions/) page of this catalog.

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Shown below is one of several possible paths through the curriculum. Students choose courses and follow a curriculum in consultation with their academic advisor; individual planning will vary based on a number of factors, including, for instance, Advanced Placement and/or transfer credits.

The minimum number of credits required for the undergraduate degree is 120, and the minimum number of credits required for the graduate degree is 34. At least 18 credits must be completed after conferral of the Bachelor's degree and cannot be double counted.

Courses taken to fulfill the undergraduate Bachelor of Science in Biology are identical to those listed in the BS in Biology curriculum (https://catalog.qu.edu/arts-sciences/biological-sciences/biology-bs/#curriculumtext).

Courses taken to fulfill the graduate Master of Science in Molecular and Cell Biology are identical to those listed in the MS in Molecular and Cell Biology curriculum (https://catalog.qu.edu/graduate-studies/arts-sciences/molecular-cell-biology-ms/#curriculumtext).

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td><strong>Fall Semester</strong></td>
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<tr>
<td></td>
<td>Milestones: Earn 40 credits, meet with your adviser at least once a</td>
<td></td>
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<tr>
<td></td>
<td>semester and have a GPA of 3.00 or higher.</td>
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</tr>
<tr>
<td>BIO 150</td>
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<td>4</td>
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<tr>
<td>&amp; 150L</td>
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<td>CHE 110</td>
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<td>4</td>
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<tr>
<td>&amp; 110L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA 140</td>
<td>Pre-Calculus 1</td>
<td>3</td>
</tr>
<tr>
<td>EN 101</td>
<td>Introduction to Academic Reading and Writing</td>
<td>3</td>
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<tr>
<td>FYS 101</td>
<td>First-Year Seminar</td>
<td>3</td>
</tr>
<tr>
<td><strong>Spring Semester</strong></td>
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<tr>
<td>BIO 151</td>
<td>Molecular and Cell Biology and Genetics and Molecular and Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>&amp; 151L</td>
<td>and Genetics</td>
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</tr>
<tr>
<td>CHE 111</td>
<td>General Chemistry II and General Chemistry II Lab</td>
<td>4</td>
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<tr>
<td>&amp; 111L</td>
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<tr>
<td>MA 141</td>
<td>Calculus of a Single Variable 1</td>
<td>3</td>
</tr>
<tr>
<td>EN 102</td>
<td>Academic Writing and Research</td>
<td>3</td>
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<tr>
<td>University Curriculum (UC) Course</td>
<td>3</td>
<td></td>
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<tr>
<td><strong>Summer Session</strong></td>
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<tr>
<td>University Curriculum (UC) Course</td>
<td>3</td>
<td></td>
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<tr>
<td>Open Elective</td>
<td>3</td>
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</table>

Birth Electives: Some biology courses have no laboratory component and are 3-credit rather than 4-credit courses. Co-requisite courses must be taken simultaneously.

College of Arts and Sciences Modern Language Requirement: All CAS students (both bachelor of science and bachelor of arts) must complete one modern language through the 102 level. Modern language courses may also count toward the UC Personal Inquiry II requirement. Students who have taken a language in high school should take the modern language placement test for that language. Students with placement scores at the 201 level or higher have demonstrated language competency and thus have passed out of the language requirement.

University Curriculum Requirement: All students must complete the 46 credits of the University Curriculum (https://catalog.qu.edu/academics/university-curriculum/). A minimum of MA 141 is required for the Bachelor of Science degree in Biology. The following courses taken for the Biology major double count as UC requirements: BIO 150 & 150L, BIO 151 & 151L, CHE 110 & 110L, CHE 111 & 111L, and PHY 110 & 110L.

Open Undergraduate Electives: Students take open electives for a total of 120 credits required for the Bachelor of Science degree in Biology. Many students pursue other interests by selecting electives in fulfillment of a minor.

Graduate Courses: Students take a total of 34 graduate credits required for the Master of Science degree in Molecular and Cell Biology.

The Accelerated Dual-Degree BS/MS program is designed for outstanding applicants. Students are offered acceptance into the program upon admission to Quinnipiac University.

Admission Requirements: College of Arts and Sciences

The requirements for admission into the undergraduate College of Arts and Sciences programs are the same as those for admission to Quinnipiac University.

Admission to the university is competitive, and applicants are expected to present a strong college prep program in high school. Prospective first-year students are strongly encouraged to file an application as early in
Milestones: Earn 84 credits and a GPA of 3.00 or higher. Meet with your academic adviser at least once per semester to discuss academic, experiential learning, career and co-curricular opportunities.

**Fall Semester**

- **BIO 252 & 252L**: Ecology and Biodiversity and Ecology and Biodiversity Laboratory 4
- **BIO 298**: Research Methods in Biology 2
- **CHE 210 & 210L**: Organic Chemistry I and Organic Chemistry I Lab
- **Language at the 101 level**: 3
- **University Curriculum (UC) Course**: 3

**Spring Semester**

- **Biology Elective**: 4
- **CHE 211 & 211L**: Organic Chemistry II and Organic Chemistry II Lab
- **Language at the 102 level**: 3
- **University Curriculum (UC) Course**: 3

**Summer Session**

- **University Curriculum (UC) Course**: 3

**Third Year**

Milestones: Earn 120 credits and a GPA of 3.00 or higher. Meet with your academic adviser at least once per semester. Complete internship or research opportunities. Prepare for graduation.

**Fall Semester**

- **Biology Elective**: 3
- **BIO 571**: Molecular Genetics
- **PHY 110 & 110L**: General Physics I and General Physics I Lab
- **CAS 420**: CAS Integrative Capstone
- **Open Electives**: 3

**J-Term**

- **Open Elective**: 3

**Spring Semester**

- **Biology Elective**: 4
- **BIO 515**: Advanced Biochemistry
- **BIO 605**: DNA Methods Laboratory
- **PHY 111 & 111L**: General Physics II and General Physics II Lab

**Summer Session**

- **Graduate Elective**: 3

**Fourth Year**

Milestones: Earn at least 34 graduate credits with a cumulative graduate GPA of 3.00 or higher. Prepare for graduation.

**Fall Semester**

- **BIO 568**: Molecular and Cell Biology

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1. Initial placement in the English and mathematics courses is determined by placement exam and an evaluation of high school units presented. Students intending to pursue graduate or professional studies (medicine, dentistry, osteopathy or veterinary medicine) are advised to complete at least one semester of calculus. A minimum of MA 141 is required for the Bachelor of Science degree in Biology.

2. Students may take either BIO 252 and 252L or BIO 298 in either order or concurrently.