**DUAL-DEGREE BS IN BIOLOGY/MS IN MOLECULAR AND CELL BIOLOGY (4+1)**

Program Contact: Deborah Clark (deborah.clark@qu.edu) 203-582-8270

The Department of Biological Sciences offers a Dual-Degree BS in Biology and MS in Molecular and Cell Biology. The MS in Molecular and Cell Biology 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 the biotechnology and biopharmaceutical industries.

Upon satisfactory completion of all of the undergraduate curriculum requirements, students receive a Bachelor of Science in Biology. The requirements and policies for the undergraduate degree are the same as described on the Bachelor of Science in Biology page (http://catalog.qu.edu/arts-sciences/biological-sciences/biology-bs/). Students complete graduate-level biology courses during their senior year; the requirements and policies for the graduate degree are the same as described on the Master of Science in Molecular and Cell Biology page (http://catalog.qu.edu/graduate-studies/arts-sciences/molecular-cell-biology-ms/).

Students earn the MS in Molecular and Cell Biology upon satisfactory completion of all of the graduate curriculum requirements.

Students who choose to pursue the Dual-Degree BS in Biology/MS in Molecular and Cell Biology (4+1) are required to complete the following courses by the end of their junior year:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHE 210 &amp; 210L</td>
<td>Organic Chemistry I and Organic Chemistry I Lab</td>
<td>4</td>
</tr>
<tr>
<td>CHE 211 &amp; 211L</td>
<td>Organic Chemistry II and Organic Chemistry II Lab</td>
<td>4</td>
</tr>
<tr>
<td>PHY 110 &amp; 110L</td>
<td>General Physics I and General Physics I Lab</td>
<td>4</td>
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<tr>
<td>PHY 111 &amp; 111L</td>
<td>General Physics II and General Physics II Lab</td>
<td>4</td>
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A minimum of two Biology Electives in separate elective categories (Molecular and Cellular Biology, Organismal, Physiology, or Experiential Learning). An elective in Molecular and Cellular Biology is strongly recommended.

**Sample Course Plan**

Shown below is one of several possible paths through the curriculum. Students choose courses and follow a curriculum determined in consultation with their adviser; 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 to take 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).

**First Year**

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>EN 101</td>
<td>Introduction to Academic Reading and Writing</td>
<td>3</td>
</tr>
<tr>
<td>FY 101</td>
<td>First-Year Seminar</td>
<td>3</td>
</tr>
<tr>
<td>Open Electives</td>
<td></td>
<td>1-2</td>
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**Second Year**

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<th>Code</th>
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<tbody>
<tr>
<td>MA 140</td>
<td>Pre-Calculus 1</td>
<td>3</td>
</tr>
<tr>
<td>Open Electives</td>
<td></td>
<td>1-2</td>
</tr>
</tbody>
</table>

**Third Year**

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<th>Code</th>
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<tr>
<td>Open Electives</td>
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<td>3</td>
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</table>

**Fourth Year**

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Open Electives</td>
<td></td>
<td>3</td>
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</tbody>
</table>
Milestones: Earn 90 credits and a GPA of 2.00 or higher. Meet with your advisor at least once per semester. Participate in study abroad, complete internship or research opportunities. Complete one year of organic chemistry and one year of physics. Meet with 4+1 program advisor to discuss plan to pursue the MS degree.

Fall Semester
- Biology Elective: 3-4 credits
- PHY 110 General Physics I & 110L General Physics I Lab: 4 credits
- University Curriculum (UC) Course: 3 credits
- University Curriculum (UC) Course: 3 credits
- Open Electives: 2-3 credits

Spring Semester
- Biology Elective: 3-4 credits
- PHY 111 General Physics II & 111L General Physics II Lab: 4 credits
- University Curriculum (UC) Course: 3 credits
- University Curriculum (UC) Course: 3 credits
- Open Electives: 2-3 credits

Fourth Year
Milestones: Earn 120 credits and a GPA of 2.00 or higher. Complete graduate coursework listed below and possible minor or double major, and prepare for graduation.

Fall Semester
- Biology Elective: 3-4 credits
- BIO 571 Molecular Genetics: 4 credits
- Graduate Elective: 3-4 credits
- CAS 420 CAS Integrative Capstone: 3 credits
- Open Electives: 1-3 credits

Spring Semester
- BIO 515 Advanced Biochemistry: 4 credits
- BIO 605 DNA Methods Laboratory: 4 credits
- Biology Elective (Experiential Learning): 1-2 credits
- Open Elective: 3 credits
- Open Electives: 2-3 credits

Fifth 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: 4 credits
- BIO 606 Protein Methods Laboratory: 4 credits
- Graduate Elective: 3-4 credits

Spring Semester
- Graduate Elective: 3-4 credits
- Graduate Elective: 3-4 credits
- BIO 675 Comp Exam in Molecular and Cell Biology: 2 credits

Minimum total combined credits: 138

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.

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

The Dual-Degree BS in Biology/MS in Molecular and Cell Biology (4+1) program is designed for highly motivated biology majors who are particularly interested in Molecular and Cell Biology. Interested students should contact the program director (alexandre.delencastre@qu.edu), and apply for the +1 year by March 30 of their third year using this application form (https://cdn.uconnectlabs.com/wp-content/uploads/sites/36/2021/01/UG_Grad-MCB-Application-Form.pdf).

Students are offered formal acceptance into the MS in Molecular and Cell Biology program after successful completion of the undergraduate degree.

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 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.

1 Initial placement in the English and mathematics courses is determined by placement exam and an evaluation of high school units presented.