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

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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 (http://catalog.qu.edu/arts-sciences/biological-sciences/biology-bs/) page. 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 (http://catalog.qu.edu/graduate-studies/arts-sciences/molecular-cell-biology-ms/) page. 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:

Code	Title	Credits
CHE 210 & 210L	Organic Chemistry I and Organic Chemistry I Lab	4
CHE 211 & 211L	Organic Chemistry II and Organic Chemistry II Lab	4
PHY 110 & 110L	General Physics I and General Physics I Lab	4
PHY 111 & 111L	General Physics II and General Physics II Lab	4
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 taken to fulfill the graduate Master of Science in Molecular and Cell Biology are identical to those listed in the MS in Molecular and Biology curriculum (https://catalog.qu.edu/graduate-studies/arts-sciences/molecular-cell-biology-ms/#curriculumtext).

Code	Title	Credits
First Year		
Milestones: Earn 30 credits, an overall GPA of 2.0 or higher, and a science GPA of 2.25. Meet with your advisor at least once each semester.		
Fall Semester		
BIO 150 & 150L	General Biology for Majors and General Biology for Majors Laboratory	4
CHE 110 & 110L	General Chemistry I and General Chemistry I Lab	4
EN 101	Introduction to Academic Reading and Writing [1]	3
FYS 101	First-Year Seminar	3
Open Electives		1-2
Spring Semester		
BIO 151 & 151L	Molecular and Cell Biology and Genetics and Molecular and Cell Biology and Genetics Lab	4
CHE 111 & 111L	General Chemistry II and General Chemistry II Lab	4
EN 102	Academic Writing and Research	3
MA 140	Pre-Calculus [1]	3
Open Electives		1-2
Second Year		
Milestones: Earn 60 credits, an overall GPA of 2.0 or higher, and a science GPA of 2.25. Meet with your advisor 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 [2]	4
CHE 210 & 210L	Organic Chemistry I and Organic Chemistry I Lab	4
MA 141	Calculus of a Single Variable	3
Language at the 101 level		3
Open Electives		1-2
Spring Semester		
BIO 298	Research Methods in Biology [2]	3
CHE 211 & 211L	Organic Chemistry II and Organic Chemistry II Lab	4
Language at the 102 level (Satisfies CAS Language Requirement)		3
University Curriculum (UC) Course		3
Open Electives		2-3
Third Year		

Milestones: Earn 90 credits, an overall GPA of 2.0 or higher (a cumulative undergraduate GPA of 3.00 is preferred), and a science GPA of 2.25. 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
PHY 110 & 110L	General Physics I and General Physics I Lab	4
University Curriculum (UC) Course		3
University Curriculum (UC) Course		3
Open Electives		2-3
Spring Semester		
Biology Elective		3-4
PHY 111 & 111L	General Physics II and General Physics II Lab	4
University Curriculum (UC) Course		3
University Curriculum (UC) Course		3
Open Electives		2-3
Fourth Year		
Milestones: Earn 120 credits, an overall GPA of 2.0 or higher (a cumulative undergraduate GPA of 3.00 is preferred), and a science GPA of 2.25. Complete graduate coursework listed below and possible minor or double major, and prepare for graduation.		
Fall Semester		
Biology Elective		3-4
BIO 571	Molecular Genetics	4
Graduate Elective		3-4
CAS 420	CAS Integrative Capstone	3
Open Electives		1-3
Spring Semester		
BIO 515	Advanced Biochemistry	4
BIO 605	DNA Methods Laboratory	4
Biology Elective (Experiential Learning)		1-2
Open Elective		3
Open Electives		2-3
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
BIO 606	Protein Methods Laboratory	4
Graduate Elective		3-4
Spring Semester		
Graduate Elective		3-4
Graduate Elective		3-4
BIO 675	Comp Exam in Molecular and Cell Biology	2
Minimum total combined credits		**138**

1 Initial placement in mathematics courses is determined by placement exam and an evaluation of high school units presented. Completion of MA 140 (Pre-Calculus) with a minimum grade of C- and either MA 141 (Calculus of a Single Variable) or MA 275 (Biostatistics) is required for the Bachelor of Science degree in Biology. Students intending to pursue graduate or professional studies (medicine, dentistry, osteopathy or veterinary medicine) are advised to complete at least one semester of calculus.

2 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 program directors Alexandre de Lencastre (alexandre.delencastre@qu.edu) and Tom Torello (tom.torello@qu.edu), and apply for the +1 year by March 30 of their third year using this application form (https://www.qu.edu/ugdualdegree/). A cumulative undergraduate#GPA of 3.00 is preferred.

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 & Sciences

The requirements for admission into the undergraduate College of Arts & 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.