

USC SCHOOL	USC Dornsife College of Letters, Arts and Science
ACADEMIC DEPARTMENT	Biological Science
GRADUATE PROGRAM	Molecular Genetics and Biochemistry
POST CODE	1476
TERM EFFECTIVE DATE	Spring 2021

PROGRAM DESCRIPTION

A brief description of the graduate program.

The Master of Science in Molecular Genetics and Biochemistry is designed to provide outstanding students in life science majors with a rigorous, quantitative experimental experience in molecular genetics, genomics, evolutionary biology, cell and molecular biology, biochemistry (depending upon the research area selected). The program is intended to position and stimulate students for possible advanced study leading to a Ph.D. in one of the areas stated above, and/or provide an important research experience to the background of a prospective medical student. The program will also provide fundamental tools and expertise for entry into a master's level positions in academic, government, or private sector research laboratories, including biotech, pharmaceuticals, or diagnostics. This is a terminal degree.

COMMON BACHELOR DEGREE PROGRAM PATHWAYS

A list of common bachelor's degrees that undergraduate students pursue in advance of pursuing a progressive degree option with this graduate program. Some programs are restricted to certain majors while others are open to all students.

Juniors at USC majoring in the life sciences, who have research experience (BISC490 or equivalent) and a willing mentor. Underclassmen who may be interested in the program should identify a research lab so that they can either complete, or be enrolled in BISC490 or equivalent experience, at the time of application. This program is not available for non-USC students.

PREPARATORY UNDERGRADUATE COURSES

A list of courses at the undergraduate level that prepare students for the graduate program. Required coursework is listed first, followed by recommended courses. If there are none, that is specified instead.

Dept. Prefix - Course #	Course Title	Required or Recommended	Units
BISC 120L	General Biology: Organismal Biology and Evolution	Required	4
BISC 220L	General Biology: Cell Biology and Physiology	Required	4
BISC 320L	Molecular Biology	Required	4
CHEM105AL	General Chemistry	Required	4

CHEM 105BL	General Chemistry	Required	4
CHEM 322AL	Organic Chemistry	Required	4
CHEM 322BL	Organic Chemistry	Required	4
BISC 490	Directed Research	Required	4

UNDERGRADUATE COURSES USED TO REDUCE GRADUATE LEVEL UNITS

A list of undergraduate level courses that may be used to reduce the number of graduate level units required for the graduate program. If there are none, that is specified instead.

Dept. Prefix - Course #	Course Title	Units
BISC 402	RNA Biology and Biotechnology	4
BISC 403	Advanced Molecular Biology	4
BISC 406L	Biotechnology	4
BISC 411	Advanced Cell Biology	4
BISC 414	Biology of Cancer	4
BISC 419L	Microbiology for a Sustainable Future	4
BISC 425	Advanced Genetics through the Literature	4
BISC 426	Principles of Neural Development	4
BISC 435	Advanced Biochemistry	4
BISC 450L	Principles of Immunology	4
BISC 451	Protein Engineering	4
BISC 480L	Developmental Biology	4
BISC 485	Advanced Seminar in Bacterial Survival and Evolution	4
QBIO 478	Computational Genome Analysis	4
QBIO 481	Structural Bioinformatic from Atoms to Cells	4

CORE GRADUATE PROGRAM REQUIREMENTS (# units required)

A list of all required graduate courses for the graduate program. None of these courses may be used toward satisfying undergraduate degree requirements.

If special exceptions for any of these courses are made by the academic department, the course # is marked with an asterisk () and the exception is explained in the "Department Notes" section at the end of this course plan template.*

Dept. Prefix - Course #	Course Title	Units
BISC 502A	Molecular Genetics and Biochemistry	4
BISC 502B	Molecular Genetics and Biochemistry	4
BISC 544	Advanced Reading in Molecular Biology (two semesters)	4
BISC 590	Directed Research (2-3 semesters)	12

PRE-APPROVED ELECTIVE COURSEWORK

Elective coursework is approved at the discretion of the academic department. Note the following details about the total number and units required of elective coursework.

2	TOTAL ELECTIVE COURSES REQUIRED FOR THE TRADITIONAL GRADUATE DEGREE
8	TOTAL ELECTIVE UNITS REQUIRED FOR THE TRADITIONAL GRADUATE DEGREE

TOTAL UNIT COUNTS AND REQUIRED GRADUATE UNITS

32	TOTAL UNITS REQUIRED FOR THE TRADITIONAL GRADUATE DEGREE
8	TOTAL GRADUATE UNITS THAT MAY BE WAIVED (IF ANY)
24	MINIMUM NUMBER OF GRADUATE UNITS THAT MUST BE AT THE 500 LEVEL OR ABOVE

NOTES FROM THE DEPARTMENT

This section highlights any unique considerations, exceptions, or requirements for the graduate program. If a program has specific restrictions (courses, majors, etc.), they are detailed below.

Because this degree is based on research, students must identify a faculty adviser prior to enrollment and submit a research proposal approved by that adviser to the master's degree committee. The mentor must agree to supervise the student for two further years, ensuring that the student makes timely progress on their research, culminating in a summative research paper. During the Master's year (5th year), the mentor agrees to participate in the discussion course BISC544 (generally, leading one meeting in each of the fall and spring semesters).

George Ingersoll	12/5/2024
Name of Authorizing Master's Program Dean	Date Approved
Associate Dean of Master's and Professional Education	
Authorizing Dean's Title	