

CELL AND MOLECULAR BIOLOGY MAJOR

The major in Cell and Molecular Biology is focused on the mechanistic study of the life of the cell at the molecular level. The curriculum is interdisciplinary and includes courses in physics, chemistry, and genetics in addition to molecular and cellular biology. Training in these areas is beneficial for careers in biological research, a number of high tech industries, medicine, and allied health professions. This challenging major requires creativity, rigor, and the ability to analyze, distill, and interpret data. A love of living systems and a level of comfort with complexity are both essential.

Due to the extensive overlap in curricula, Cell and Molecular Biology majors cannot double major in Biological Chemistry. Students can double major in Cell and Molecular Biology and Neuroscience, but there are additional requirements that must be met beyond those requirements for most double major combinations.

Requirements

Students majoring in cell and molecular biology must complete a minimum of eleven courses in the biology components, totaling at least 25 credits; 16 credits in chemistry; and 8 credits of physics with laboratories. Students must also complete Calculus (MATH 1210 Calculus I (4 c.h.) or MATH 1310 Consolidated Calculus (4 c.h.)) and Statistics for Scientists (MATH 1230 Stats For Scientists (4 c.h.)) to satisfy the major and BS requirements.

| Course ID | Title | Credits |
|--|---|---------|
| Chemistry Component | | |
| CHEM 1070 | General Chemistry I | 3 |
| CHEM 1080 | General Chemistry II | 3 |
| CHEM 1075 | General Chemistry Lab I | 1 |
| CHEM 1085 | General Chemistry Lab II | 1 |
| CHEM 2410 | Organic Chemistry I | 3 |
| CHEM 2420 | Organic Chemistry II | 3 |
| CHEM 2415 | Organic Chemistry Lab I | 1 |
| CHEM 2425 | Organic Chemistry Lab II | 1 |
| Math Component | | |
| Select one of the following: | | 3-6 |
| MATH 1210 | Calculus I | |
| MATH 1310 | Consolidated Calculus | |
| MATH 1150 & MATH 1160 | Long Calculus I and Long Calculus II | |
| MATH 1230 | Stats For Scientists | 4 |
| Physics Component | | |
| Select one of the following: | | 8 |
| PHYS 1210 & PHYS 1220 | Introductory Physics I and Introductory Physics II | |
| PHYS 1310 & PHYS 1320 | General Physics I and General Physics II | |
| Cell and Molecular Biology Core Component | | |
| CELL 1010 | Intro to Cell & Molec Biology | 3 |
| CELL 2115 | General Biology Lab | 1 |
| CELL 2050 | Genetics | 3 |
| CELL 3030 | Molecular Biology | 3 |
| CELL 3750 | Cell Biology | 3 |
| CELL 3755 or CELL 3035 | Cell Biology Laboratory Molecular Biology Lab | 1 |
| Select one additional 3 or 4 credit CELL lecture or lecture/lab course | | 3-4 |
| Biochemistry Component | | |
| Select one of the following: | | 3-6 |
| CELL 4010 | Cellular Biochemistry | |

CHEM 3830
& CHEM 3840Intro To Biochemistry
and Intermediate BiochemCENG 4450
& CENG 4460Applied Biochemistry I
and Applied Biochemistry II**Total Credit Hours****51-58**

Elective Component

An additional **three** elective courses are required, with at least two of the three being laboratory oriented. Only one laboratory elective may be satisfied by independent laboratory research (CELL 4910 Independent Study (1 to 3 c.h.), CELL 4920 Independent Study (1 to 3 c.h.), CELL 4990 Honors Thesis (3 c.h.) or CELL 5000 Honors Thesis (4 c.h.)). Students may use approved courses from other departments to fill the elective component. A list of courses which fulfill this requirement is available on the CMB Department website or from the CMB Department office. Total credit hours: 5-11.

Capstone Component

Finally, students must use one of their electives to complete a capstone requirement (CELL 3230 Virology (3 c.h.), CELL 3400 Regenerative Biology (3 c.h.), CELL 4250 Principles In Immunology (3 c.h.), CELL 4260 Princ of Biomed Write Capstone (3 c.h.), CELL 4440 Advanced Molecular Biology (3 c.h.), CELL 4450 Genome Biology (3 c.h.), CELL 4710 Molec Biology of Cancer (3 c.h.), CELL 5110 Capstone Component: CELL 4910 (0 c.h.), CELL 5111 Capstone Component: CELL 4920 (0 c.h.), or CELL 5000 Honors Thesis (4 c.h.)).