# BIOCHEMISTRY AND MOLECULAR BIOLOGY, B.S.

## Requirements

The biochemistry and molecular biology major requires 49 credits of BIO, BMB, or CHM courses, and students will need to take at least two courses from these requirements each semester for adequate progress in the major.

| Code | Title | Hours |
|---|---|---|
| **Required Major Courses** | | |
| Broad Foundation in Chemistry: * | | |
| CHM 111 & 111L | College Chemistry I and College Chemistry I Lab | 4 |
| CHM 280 & 280L | College Chemistry II and Theory and Methods of Quantitative Analysis Lab | 4 |
| CHM 122 & 122L | Organic Chemistry I and Organic Chemistry I Lab | 4 |
| or CHM 123 & 123L | Organic Chemistry I Honors and Organic Chemistry I Honors Lab | |
| CHM 223 & 223L | Organic Chemistry II and Organic Chemistry II Lab | 4 |
| Broad Foundation in Biology: * | | |
| BIO 150 & 150L | Biology I and Biology I Lab | 4 |
| BIO 160 & 160L | Biology II and Biology II Lab | 4 |
| BIO 265 | Cellular and Molecular Biology | 3 |
| BMB Core Sequence: | | |
| BMB 370 | Biochemistry I: Macromolecules and Metabolism (Third Year) | 3 |
| BMB 372 | Advanced Molecular Biology (Third or fourth year) | 3 |
| BMB 373 | Biochemistry II | 3 |
| BMB 371L | Advanced Biochemistry Lab (Third Year) | 1.5 |
| BMB 372L | Advanced Molecular Biology Laboratory (Third or fourth year) | 1.5 |
| BMB 388 | Senior Seminar in Biochemistry and Molecular Biology (Senior year only) | 1 |
| The BMB research requirement of two semesters or summers of research fulfilled by enrolling in two of the following courses: BMB 390, BMB 391, BIO 391, CHM 391, BMB 392, BIO 392, or CHM 392. ** | | 2-6 |
| BMB 395 | Senior Research Project (Senior year only; guided by a faculty member) | 2 |
| Electives | | |
| **Co-Requirements** *** | | |
| MST 112 | Calculus with Analytic Geometry II | 4 |
| PHY 113 | General Physics I | 4 |
| or PHY 123 | General Physics I - Studio Format | |
| PHY 114 | General Physics II | 4 |
| or PHY 124 | General Physics II - Studio Format | |

* *These biology and chemistry core courses should be completed in the first two years of study.*

** *At least two semesters or summers of research are required for research performed in a laboratory at Wake Forest University or the Wake Forest School of Medicine.*

*** *Should also be completed by the end of the third year.*

Elective courses must be selected from the following list. For course descriptions, see the relevant department's listing in this publication. Additional elective courses may have been approved since publication of this bulletin. The program coordinator maintains a complete list of all approved elective courses. Students choosing the concentration in molecular biology can take any two from the list, while students choosing the biochemistry concentration must take either BMB 376 or CHM 341 and one other elective.

## Elective Courses

| Code | Title | Hours |
|---|---|---|
| BMB 301 | Special Topics in Biochemistry and Molecular Biology | 3 |
| BMB 376 | Biophysical Chemistry | 3 |
| BMB/BIO 381 | Epigenetics | 3 |
| BMB/BIO 382 | Molecular Signaling | 3 |
| BMB/BIO 383 | Genomics | 3 |
| BIO 317 & 317L | Plant Physiology and Development and Plant Physiology and Development Lab (lab is optional) | 3-4 |
| BIO 336 & 336L | Development and Development Lab (lab is optional) | 3-4 |
| BIO 360 | Metabolic Diseases | 3 |
| BIO 362 | Immunology | 3 |
| BIO 365 | Biology of the Cell | 3 |
| BIO 367 | Virology | 3 |
| BIO 368 & 368L | The Cell Biological Basis of Disease and The Cell Biological Basis of Disease Lab (lab is optional) | 3-4 |
| BIO 369 | Cancer Biology | 3 |
| BIO 384 | Molecular Evolution | 3 |
| BIO 388 | Methods in Molecular Genetics | 4 |
| CHM 324 | Medicinal Chemistry I | 3 |
| CHM 334 | Chemical Analysis | 4 |
| CHM 341 | Physical Chemistry I | 3 |
| CSC/BIO 385 | Bioinformatics | 3 |
| CSC/BIO 387 | Computational Systems Biology | 3 |
| PHY/BIO 307 | Biophysics | 3 |
| PHY 320 | Physics of Biological Macromolecules | 3 |

## Honors

Highly qualified majors may be eligible to graduate with honors in biochemistry and molecular biology if their research project is of sufficient quality. To be awarded the distinction "Honors in Biochemistry and Molecular Biology," a graduating student must have a minimum GPA of 3.0 in all courses and a 3.3 in required and elective BIO, BMB, and CHM courses. Honors students will have begun research before their senior year. Students interested in pursuing an honors degree must obtain preapproval from the program coordinator during the fall of the senior

year and enroll in BMB 395 during their senior year. The student must prepare an honors paper describing his or her independent research project, written in the form of a scientific paper, which must be submitted to, and approved by, an advisory committee. Honors students are also required to make a short oral presentation at the end of their senior year. For additional information, please consult the program coordinator or BMB faculty advisors.