

Biochemistry (Biological Emphasis) Major

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The Departments of Biology and Environmental Science and Chemistry offer an interdisciplinary major program of study to a Bachelor of Arts in Biochemistry. The major program is structured into two tracks, biological emphasis and chemical emphasis, to allow the student to pursue a more advanced study of biochemistry to fulfill their particular interests and professional goals. Both tracks require introductory biology and chemistry courses with emphasis on fundamental concepts and give students a clear insight into the underlying biological and chemical principles. The Biodiversity, Biological Processes and General Chemistry courses fulfill the general degree requirements for a course in Laboratory science as well as serving as foundation courses for biochemistry students.

Students completing a Biology or Chemistry major may not also receive a Biochemistry major. Students majoring in Biochemistry cannot obtain a second major or minor in Biology or Chemistry. Biochemistry majors may double major in One Health, but must do so in close consultation with the Department of Biology and Environmental Science.

The Departments strongly recommend that students majoring in Biochemistry (Biological Emphasis) take Calculus through Calculus II (MAT 124 and MAT 214) and Physics I and II (PHY 201 and PHY 212). Any student who elects to take BIO 404, Biochemistry, must have successfully completed both semesters of Organic Chemistry or be currently taking CHM 324/325. No more than four hours of BIO 398 Independent Study Research Projects, may be counted toward the major. Students must earn a letter grade of C- or better in all courses needed to satisfy major requirements.

Biochemistry Honors: This designation would be given for Biochemistry majors who meet the following criteria.

2. GPA \geq 3.3 average for all BIO courses
3. Two semesters for independent, hypothesis-driven research
 - a) Preferable: A single project carried out over 2 semesters for a total of 4-6 hours of independent stud
 - b) Alternatively:
 - I. Two single semesters for a total of 4-6 hours of independent stud
 - II. A summer Research Experience for Undergraduates (REU) or similar type of research experience and a single semester (2-3 hours). These projects MUST be pre-approved and must be accompanied by a formal campus presentation.

3. A formal thesis/paper that is evaluated by at least two faculty members
4. An oral or poster presentation at the Undergraduate Scholars forum or at a local, regional, or national conference

At least 50% of all BIO and CHM hours needed to satisfy the major (22-24) must be Westminster courses.

ACADEMIC REQUIREMENTS SUMMARY SHEET

ACADEMIC YEAR 2024-2025

Major: Biochemistry (Biological Emphasis)

| | | |
|---------------------|---------------------|----------------|
| Student's Last Name | First Name | Middle Initial |
| Advisor | Date Major Declared | |

| Course Code | Title | Hours | Semester | Grade |
|--|--|-------|----------|-------|
| Biology Required Courses (12 hours) | | | | |
| BIO 114/115 | Biological Processes | 4 | | |
| BIO 124/125 | Biodiversity | 4 | | |
| BIO 404 | Biochemistry (CHM 314/315 prerequisite 324/325 co-prerequisite) | 4 | | |
| Chemistry Required Courses (16 hours) | | | | |
| CHM 114/115 | General Chemistry I | 4 | | |
| CHM 124/125 | General Chemistry II | 4 | | |
| CHM 314/315 | Organic Chemistry I | 4 | | |
| CHM 324/325 | Organic Chemistry II | 4 | | |
| Biology Electives (Choose three of the following courses (9-12 hours)) | | | | |
| BIO 212 | Research Methods | 3 | | |
| BIO 304 | Immunology | 3 | | |
| BIO 301 | Genetics | 4 | | |
| BIO 303 | Microbiology (BIO 114/115 & 124/125 prerequisites) | 4 | | |
| BIO 310 | Environmental Toxicology | 3 | | |
| BIO 325 | Molecular Cell Biology | 4 | | |
| BIO 330 | Virology (BIO 301 recommended) | 3 | | |
| BIO 372 | Developmental Biology (BIO 301 prerequisite) | 4 | | |
| BIO 398 | Independent Research Projects in Biochemistry | 3-4 | | |
| BIO 420 | Physiology (BIO 302 or 322 prerequisite) | 4 | | |
| Chemistry Electives (Choose two of the following courses (6-8 hours)) | | | | |
| CHM 304 | Inorganic Chemistry | 3 | | |

| Course Code | Title | Hours | Semester | Grade |
|--|--|--------------|----------|-------|
| CHM 334/335 | Analytical Chemistry I (lab required) | 4 | | |
| CHM 344/345 | Analytical Chemistry II (lab required) | 4 | | |
| CHM 410 | Advanced Topics in Chemistry | 3 | | |
| CHM 404 or | Physical Chemistry for the Life Sciences | 3 | | |
| CHM 424/425 | Physical Chemistry I (lab required) | 4 | | |
| CHM 434/435 | Physical Chemistry II (lab required) | 4 | | |
| Other Required Course, Choose One (3-5 hours) | | | | |
| MAT 114 | Elementary Statistics | 3 | | |
| MAT 124 | Calculus I | 5 | | |
| Total hours for Major | | 46-53 | | |

If any substitutions or waivers of requirements are allowed, please list below and initial.

Advisor Signature

Department Chair Signature