

B.S. in Cellular and Molecular Biology/ Biochemistry

College of Sciences and Technology

2008-2009 Academic Advising Center Old Main 380 360.650.3850 Advising@cc.wvu.edu

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Why should I consider a Cellular and Molecular Biology/ Biochemistry Major?

Molecular Biology is defined as the study of Biochemistry, the structure and function cell biology, molecular genetics and

genomics of prokaryotic and eukaryotic model organisms. Molecular Biology is among the most rapidly growing

fields within Biology with recent accomplishments such as the sequencing of the entire human genome.

What is the study of Cellular and Molecular Biology/ Biochemistry?

Biology, as the study of living things, is an academic endeavor with a pure or basic research focus on seeking answers to questions rather than on applying biological knowledge to solve problems. As scientists, Biologists have two prime motivations: (1) intellectual curiosity about biological systems, and (2) the philosophy that creating and disseminating reliable knowledge has intrinsic worth. Thus, we intend for our intensive academic program in Biology to stimulate our students' curiosity and appetite for life-long learning

about biology.

The Biology curriculum provides an effective combination of knowledge in areas that students can apply to many careers. The supporting courses for the Biology major in Math, Physics, and Chemistry, along with the core curriculum at the 200-level and 300-level, plus one 400-level course in Evolution, fulfill the goals of a liberal arts education alone. But the in-depth 400-level courses are where students not only pursue interests more specifically, but begin to integrate

and apply knowledge, and develop the skills and abilities to pursue careers of their choosing.

Hence, the integrated conceptual foundation in Biology, the critical thinking skills, quantitative problem-solving abilities, leadership with team-building skills, and scientific research skills students obtain from lecture and laboratory courses in the Biology B.S. curriculum ultimately are more important for job performance.

Mid Program Checkpoint:

Students intending to complete a Bachelor's of Science degree in Cellular and Molecular Biology-Biochemistry within four years should complete the following courses by the start of their junior year. Students are expected to follow all prerequisite requirements for courses and seek early departmental advisement.

Coursework:

CHEM 121, 122, 123
BIOL 204, 205 206
MATH 124

Other Activities:

Attend Biology seminars on Wednesdays at 4pm.

Engage in or start planning appropriate research and/or internship experiences.

How to Declare a Cellular and Molecular Biology/ Biochemistry Major:

Declare your Biology major as soon as you think you may want to be a Biology major. See Kim Kolb-

Ayre in the Biology Department Office, BI 315 for details.

Freshmen, your first quarter is not too soon.

Contact Information:

[Biology Department Website](#)

[Chemistry Department Website](#)

Department Chair:

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Sample Career Fields:

- Biomedical Research
- Pharmaceutical Research
- Biology Educator
- Cell Physiology
- Forensic Scientist
- Genetic Counseling
- Autoimmune Disease Research
- Nutritionist

Cellular and Molecular Biology/Biochemistry Major

Requirements: 105 Credits

Supporting Courses: 56 credits

CHEM 121 General Chemistry I (5)
CHEM 122 General Chemistry II (5)
CHEM 123 General Chemistry III (4)
Or CHEM 125, 126, 225 General Chemistry—Honors (5 each)
CHEM 351 Organic Chemistry (4)
CHEM 352 Organic Chemistry (4)
CHEM 353 Organic Chemistry (3)
CHEM 354 Organic Chemistry Lab I (2)
MATH 124 or 134 Calculus and Analytic Geometry/Honors Calculus I (5)
MATH 125 or 135 Calculus & Analytic Geometry/Honors Calculus II (5)
MATH 240 Introduction to Statistics (4)
or MATH 341 Probability and Statistical Inference (4)
PHYS 121 Physics with Calculus I (4)
PHYS 122 Physics with Calculus II (4)
PHYS 123 Electricity and Magnetism (4)
PHYS 131 Physics with Calculus I Lab (1)
PHYS 132 Physics with Calculus II Lab (1)
PHYS 133 E and M Laboratory (1)

Required Biology Core Courses: 46 credits

BIOL 204 Intro to Evolution, Ecology & Biodiversity (4)
BIOL 205 Intro to Cellular and Molecular Biology (5)
BIOL 206 Intro to Organismal Biology (5)
BIOL 321 Genetics (4)
BIOL 322 Genetics Lab (2)
Or BIOL 346 Microbiology Lab (2)
BIOL 323 Cell and Molecular Biology (4)
BIOL 324 Methods in Molecular Biology (3)
BIOL 345 Fundamentals of Microbiology (3)
BIOL 470 Functional Genomics (3)
BIOL 471 Molecular Biology and Biochemistry (3)
BIOL 472 Molecular Biology and Biochemistry (3)
BIOL 473 Molecular Biology (3)
BIOL 474 Biochemistry Laboratory (3)

Other Biology or Chemistry options:

B.A. in Biology (74 credits)
B.A. in Behavioral Neuroscience (109-110credits)
B.A. in Biology/Anthropology (89 + 23 supporting credits)
B.A. in Chemistry (86 credits)
B.S. in Chemistry (106 credits)
B.S. in Biochemistry (108 credits)
B.S. in Biology (90-95 credits)
B.S. in Biology/Anthropology (101-104 credits)

Electives: Chosen from courses listed below. One Group A selection must be included among the electives chosen.

Group A Electives:

BIOL 436 Molecular Phylogeny & Microbial Diversity (5)
BIOL 451 Plant Growth and Development (3)
and BIOL 453 Investigations in Plant Development (3)
BIOL 467 Comparative Vertebrate Physiology (3)
and BIOL 468 Comparative Vertebrate Physiology Lab (3)
BIOL 479 Plant Physiology (5)
BIOL 482 Developmental Biology of Animals (3)
and BIOL 484 Developmental Biology Lab (3)
BIOL 494 Biology Research (2 minimum)
or BIOL 495 Research Communication (2 minimum)

Group B Electives:

BIOL 325 Ecology (3)
BIOL 432 Evolutionary biology (4)
BIOL 445 Current Trends in Biology (topical) (3)
BIOL 467 Comparative Vertebrate Physiology (3)
BIOL 478 The Biochemistry of Drug Action (3)

These courses are required (or advised) for this major and may be used to satisfy GUR or Writing Proficiency requirements.

QSR: MATH 124, 125

LSCI: CHEM 121, 122, 123,
BIOL 204, 205, 206

WP: Three Writing Proficiency points are required for graduation (they are noted as WP1, WP2, WP3). Check [Classfinder](#) or [Online Timetable](#) for departmental offerings each quarter.

B.S. in Biology Mathematics (104-105 credits)
B.A. Ed. Chemistry/Physics—Secondary (106-107 credits + cert. program)
B.A. Ed. Chemistry/Biology—Secondary (103-104 credits + cert. program)
B.A. Ed. Chemistry/Mathematics—Secondary (106-120 credits + cert program)
Minor in Biology (43 credits)
Minor in Chemistry (30-32 credits)