

Bachelor of Science – Biochemistry & Molecular Biology

The BS degree in Biochemistry and Molecular Biology provides a degree path centered on the molecular basis of living systems with training in molecular genetics, biochemistry, and cell biology, as well as in rapidly developing areas such as bioinformatics. Majors must select an option either in [Advanced Molecular Biology](#), [Computational Molecular Biology](#), or [Pre-Medicine/Biochemistry and Molecular Biology](#). The first two options are designed for students interested in careers in the biotechnology and pharmaceutical industries or graduate work in the molecular life sciences, with the second especially well-suited for students interested in computational aspects of molecular biology. The third option is ideal for students interested in careers in medicine and related health professions.

Advanced Molecular Biology Option: The Advanced Molecular Biology option is designed for students interested in pursuing graduate work in molecular life sciences or entering the workforce in the biotechnology and pharmaceutical industries. It provides advanced training in genomics, epigenetics and other areas of current research in molecular biology, in addition to the core courses in the major. Students are strongly encouraged to participate in undergraduate research, and up to six research credits can be applied to the Upper-division Science Elective requirements. Faculty advisors work with students to help them identify electives, research opportunities, and professional internships that align with their interests.

Computational Molecular Biology Option: The Computational Molecular Biology option is designed for students interested in the interface of molecular biology, computer science, and statistics. It provides strong preparation for graduate school in computational biology as well as the biotechnology and pharmaceutical industry workforce. This option couples the comprehensive core training in biochemistry and molecular biology with advanced course work in mathematics, statistics, computer science, and bioinformatics. Students are strongly encouraged to participate in undergraduate research, and up to six research credits can be applied to the Upper-division Science Elective requirements. Faculty advisors work with students to identify elective courses, undergraduate research opportunities, and professional internships that support their individual interests.

Pre-Medicine/Biochemistry and Molecular Biology Option: Biochemistry and Molecular Biology students interested in a career in medicine should choose this option. It may also be suitable for students interested in some other health professions and these students should first consult with their advisor. In addition to offering a rigorous foundation in biochemistry, molecular and cellular biology, chemistry, and genetics, the Pre-medicine option meets the requirements for most medical schools in the U.S. by providing students with training in psychology, ethics and social sciences. Students have a wide choice of medically relevant electives in areas such as physiology, microbiology, and immunology. Students are strongly encouraged to participate in undergraduate research. Faculty pre-med advisors guide students to integrate undergraduate research and other relevant professional opportunities into their undergraduate experience and to prepare themselves as strong candidates for admission to the professional schools of their interest.

OSU Graduation Requirements:

Students pursuing a degree at OSU must meet the following requirements in addition to program and college requirements.

- 180 minimum credits required to graduate
- 60 minimum upper division credits required
- 45 of last 75 credits must be OSU credits.
- Maintain a 2.0 or better university GPA
- Max 18 course withdraws (W grade)
- Max 11 credits PAC

BACCALAUREATE CORE Requirements: <https://catalog.oregonstate.edu/earning-degrees/bcc/>

- Search Bacc Core classes in the Schedule of Classes.
- Transfer students who have an AAOT have all Skills and Perspectives completed.
- Students with AAOT still need to complete Synthesis for Bacc Core.

Skills	Notes	Grade
Lifetime Fitness (2cr)	HHS 231	
Lifetime Fitness PAC (1cr)	Physical Activity Course (PAC)	
Mathematics (3-4cr)	Fulfilled by major: MTH 251	
Writing I (4cr)	WR 121z	
Writing II (4cr)		
Speech (4cr)		
Perspectives: No more than two courses from the same department may be used to satisfy the Perspectives requirements.		
Cultural Diversity (3-4cr)		
Literature & Arts (3-4cr)		
Social Processes & Institutions (3-4cr)	Fulfilled in Pre-Med Option; PSY suggested for pre-health	
Western Culture (3-4cr)	Fulfilled in Pre-Med Option	
Physical Science (4cr)	Fulfilled by Major: CH 2XX sequence	
Biological Science (4cr)	Fulfilled by Major: BI 22X sequence	
Additional Phys or Bio Science (4cr)	Fulfilled by Major: CH 2XX & BI 22X sequences	
Difference, Power, & Discrimination (3-4cr)		
Synthesis: Must be upper division and no more than two courses from the same department may be used.		
Contemporary Global Issues (3-4cr)		
Science, Tech & Society (3-4cr)	Course options within Pre-med option	

Biochemistry & Molecular Biology Major Requirements:

- **Required Option:** Complete one of three options in Advanced Molecular Biology, Computational Molecular Biology, or Pre-Medicine/Biochemistry & Molecular Biology

Biochemistry and Molecular Biology Major Requirements			
A grade of C- or better is required for the following courses for the Biochemistry & Molecular Biology major:			
Core Sequences	Pre/Co-Requisites & Notes	Term Typically Offered	Grade
CH 231 & 261 General Chem. & Lab (4+1)	MTH Placement	Fall	
CH 232 & 262 General Chem. & Lab (4+1)	CH 231/261 (C-)	Winter	
CH 233 & 263 General Chem. & Lab (4+1)	CH 232/262 (C-)	Spring	
BI 221 Principles of Biology: Cells (4)	CH 231/261 (C-), may be taken concurrently	Fall, Summer 24	
BI 222 Principles of Biology: Organisms (4)	BI 221 (C-)	Winter, Summer 24	
BI 223 Principles of Biology: Populations (4)	BI 221 (C-)	Spring, Summer 24	
MTH 251 Calculus I (4)	MTH 112Z (C-)	Fall, Winter	
MTH 252 Calculus II (4)	MTH 251 (C-)	Winter, Spring	
ST 351 Introduction to Statistical Methods (4)	HS algebra with statistics recommended	Fall, Summer 24	
CH 334 Organic Chemistry (3)	CH 233/263 (C-)	Fall	
CH 335 Organic Chemistry (3)	CH 334 (C-)	Winter	
CH 336 Organic Chemistry (3)	CH 335 (C-)	Spring	
CH 337 Organic Chemistry Lab (4)	CH 331/332 or CH 334/335/336	Spring	
OR	Pre-health profession		
CH 324 Quantitative Analysis (4)	CH 233/263 (C-)	Fall	

Biochemistry and Molecular Biology Major Requirements Continued			
Core Sequences	Pre/Co-Requisites & Notes	Term Typically Offered	Grade
PH 201 General Physics (5)	MTH 112z or higher	Fall	
PH 202 General Physics (5)	MTH 112z or higher & PH 201	Winter	
PH 203 General Physics (5)	MTH 112z or higher & PH 202	Spring	
BMB Core Coursework	Pre/Co-Requisites & Notes	Term Typically Offered	Grade
BI 198 Professional Development I: Biology & Zoology (1)	Approved sub for BB 111	Fall	
BB 314 Cell and Molecular Biology (4)	BI 221, 222, 223 (C-); CH 233 & 263 (C-)	Winter	
BB 315 Molecular Biology Lab (3)	BB 314 (C-)	Winter	
BI 319 Theory, Practice, & Discourse in the Life Sciences (3)	BI 221, 222, 223 (C-) Approved sub for BB 317	Spring	
BB 490 Biochemistry 1: Structure/Function (3)	BI 221, 222, 223 (C-); CH 336 (C-)	Fall	
BB 491 Biochemistry 2: Metabolism (3)	BB 490	Winter	
BB 492 Biochemistry 3: Genetic Biochemistry (3)	BB 490 & BB 491	Spring	
BB 481 Macromolecular Structure	BB 490	Spring 25	
BB 494 Biochemistry Lab Molecular Tech. (3)	BB 315	Fall 25	
BB 486 Advanced Molecular Genetics (3)	BB 492 (C-) & BB 314 (C-)	Offered 2025-2026	

Biochemistry & Molecular Biology Major Required Options:

- **Required Option:** Complete one of the three options below (21 -22 credits)

Advanced Molecular Biology (21 credits)	Pre/Co-Requisites & Notes	Term Typically Offered	Grade
BB 345 Python for Molecular Biologist (3)		Fall	
Electives for Option (select at least 18cr)			
BB 401 Undergraduate Research	Required Dept. Approval		
BB 485 Applied Bioinformatics (3)	BI 221 & BB 345 or CS 201 or CS 161 (C-)	Spring	
BI 311 Genetics (4)	BI 221, 222, 223 (C-)	Fall	
BI 445 Evolution (3)	BI 311	Spring	
MB 302 Gen. Microbiology & MB 303 Lab (5)	CH 335 (C-) & BI 221 & 222 (C-)	Spring	
ST 352 Intro to Statistical Methods (4)	ST 351	Winter, Summer 24	

Computational Molecular Biology (21 credits)	Pre/Co-Requisites & Notes	Term Typically Offered	Grade
BB 485 Applied Bioinformatics (3)	BI 221 (C-); BB 345 (C-)	Spring	
BB 345 Python for Molecular Biologist (3)	You can take CS 161 through Ecampus instead of BB 345 to meet this requirement	Fall	
Electives for Option (Select 14-15 credit from the following)			
BB 401 Undergraduate Research	Required Dept. Approval		
BI 311 Genetics (4)	BI 221, 222, 223 (C-)	Fall	
CS 162 Intro. to Computer Sci II (4)	ENGR 103 offered in Spring; please see advisor to discuss prerequisites	Fall	
MTH 231 Elements of Discrete Math (4)	MTH 111z (C-) or ALEKs 60	Spring	
ST 352 Intro to Statistical Methods (4)	ST 351	Winter, Summer 24	

Biochemistry & Molecular Biology Major Required Options Continued:

Pre-Medicine/Biochemistry & Molecular Biology (22 credits)	Pre/Co-Requisites & Notes	Term Typically Offered	Grade
BI 197 Professional Development I: Health Professions (1)	Approved sub for BI 109	Winter	
PSY 201Z General Psychology (4) OR PSY 202 General Psychology (4)	Bacc Core Social Processes	Winter Fall, Spring	
PHL 205 Ethics (4) OR PHL444/REL 444 Biomedical ethics	Currently offered Ecampus; Bacc Core Western Culture Currently offered over ecampus; Honors option; Bacc Core STS	Offered 2025-2026 Not offered at Cascades	
SOC 204 Introduction to Sociology (4)	Bacc Core Social Processes	Winter	
Science Electives for Option (Select a minimum of 10 credits from the following)			
BB 332 Molecular Medicine (3)	Recommended: any bio class; Bacc Core STS	Fall	
BB 401 Undergraduate Research	Required Dept. Approval		
BI 311 Genetics (4)	BI 221, 222, 223 (C-)	Fall	
MB 302 Gen. Microbiology & MB 303 Lab (5)	CH 335 (C-) & BI 221 & 222 (C-)	Spring	

*Disclaimer: Information is for OSU-Cascades only and is subject to change with curriculum changes. Catalog year refers to the year students are admitted to OSU and declare the BMB Major.