

# BIOLOGY; MOLECULAR (MAJOR)

## What you will study

DNA is the master molecule of living things. To understand how the most basic processes of life work, molecular biologists study DNA from many different perspectives in an integrated way. As an Alverno molecular biology student, you take a select program of biology and physical science courses that introduce you to a variety of theories and techniques that can be applied to DNA.

Your beginning courses follow the sequence of the biology major. They lay the foundation of biology and chemistry principles, and introduce the real world of laboratory experiments. You begin to develop the analytical and problem-solving skills of a practicing scientist, and you learn to work both independently and as part of a laboratory team.

As you move into the intermediate courses of the program, your studies become more focused on the fields of science that gave rise to molecular biology, and the disciplines of biology that intensively use molecular technology today. You learn to ask and answer more complex scientific questions. You work with scientific models to show how different concepts fit together, and you learn to build, test, and refine models through laboratory work. Progressing through the intermediate coursework, you appreciate how different disciplines of biology and chemistry reveal the molecular basis of life, and how molecular science supports all disciplines of biology.

In your advanced work, you become increasingly independent in learning through laboratory experiences, the scientific literature, and critical thinking about scientific questions. Your courses examine the scientific concepts that are critical to understanding how DNA makes up genes, how DNA controls cells, and how the knowledge of DNA can be used to change living organisms. You explore laboratory techniques that are routinely used in molecular biology research, and you learn how to adapt and combine those techniques to solve sophisticated laboratory problems. In the capstone course, you bring the diverse perspectives of your prior work together and examine molecular biology as a unique discipline within biology.

## Alverno Difference

Alverno classes are small and interactive. Students cooperate in learning communities to work on case studies, analyze actual data, and carry out projects. Integrated within their course work students apply science content to critically analyze varied values to current global and local issues. Our students participate in research through class experiments and special programs. Internships give students the opportunity to explore careers, work with cutting-edge technology, and make connections that often result in job offers before graduation. Students can also collaborate with faculty by attending professional conferences, working on faculty research or doing independent research with faculty guidance.

Students who plan to attend professional school can participate in a series of workshops on topics like preparing for entrance exams, creating successful applications, and getting letters of recommendation.

## Requirements

Code	Title	Credits
<b>Biology Molecular Spec Major Beginning</b>		
Take one BI 200 level course of the following:		3-4
BI-221	Biology of Plants	
BI-222	Biology of Animals	
BI-223	Natural History of North America	
CH-213 & 213L	Chemistry of Bioorganic Molecules and Chemistry of Bioorganic Molecules Lab	4
CH-221 & 221L	Organic Chemistry 1 and Organic Chemistry 1 - Lab	4
Take one of the following:		3-4
MT-123	College Algebra	
MT-148	Functions & Modeling	
MT-152	Calculus 1	
MT-124	Trigonometry	2
<b>Biology Molecular Spec Major Intermediate</b>		
BI-251 & 251L	Microbiology and Microbiology Lab	4
BI-328 or CH-328	Biochemistry	4
BI-361 & 361L	Genetics Lecture and Genetics Lab	4
BI-325	Cellular Biology	3
BI-374	BI Assessment in Effective Citizenship	1
BI-399	Formal Introduction to Advanced Work	0
Take 5 credits of Biology Electives (one course at the 300 or 400 level)		5
CH-234 & 234L	Analytical Chemistry/Quantitative Analysis and Analytical Chem-Quant Analysis Lab	4
MT-256	Probability and Statistics	4
PH-231 or PH-241	Algebra-Based Physics I Calculus-Based Physics 1	4
PH-232 or PH-242	Algebra-Based Physics 2 Calculus-Based Physics 2	4
<b>Biology Molecular Spec Major Advanced</b>		
INTERN-383	Internship Seminar	2
BI-491	Senior Environmental Seminar	3
BI-425 & 425L	Molecular Biology and Molecular Biology Lab	4
BI-452	Immunology	3

This major does not require a minor and follows the general education requirements (<https://catalog.alverno.edu/weekday-college/general-education>) for standard majors-science related.