

Biochemistry and Molecular Biology

Biochemistry and Molecular Biology Major

The Biochemistry and Molecular Biology major is designed to give students a detailed understanding of the chemistry of living matter. Careers exist in medical, pharmaceutical, food processing, and agricultural laboratories. Graduates also will have excellent preparation for graduate school or schools of medicine, dentistry, veterinary science, and business.

Biochemistry Minor

A minor in Biochemistry also is available. Contact the department (<https://www.ndsu.edu/chemistry>) for details.

Major Requirements

Major: Biochemistry & Molecular Biology

Degree Type: B.A. or B.S.

Minimum Degree Credits to Graduate: 122

General Education Requirements for Baccalaureate Degree

- A list of approved general education courses is available here (<http://bulletin.ndsu.edu/past-bulletin-archive/2017-18/academic-policies/undergraduate-policies/general-education/#genedcoursestext>).
- General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review the major, minor, and program emphases requirements for minimum grade restrictions, should they apply.

Code	Title	Credits
Communication (C)		12
ENGL 110	College Composition I	
ENGL 120	College Composition II	
COMM 110	Fundamentals of Public Speaking	
Upper Division Writing [†]		
Quantitative Reasoning (R) [†]		3
Science and Technology (S) [†]		10
Humanities and Fine Arts (A) [†]		6
Social and Behavioral Sciences (B) [†]		6
Wellness (W) [†]		2
Cultural Diversity (D) ^{**†}		
Global Perspectives (G) ^{**†}		
Total Credits		39

* May be satisfied by completing courses in another General Education category.

† May be satisfied with courses required in the major. Review major requirements to determine if a specific upper division writing course is required.

College Requirements

Code	Title	Credits
Bachelor of Arts (BA) Degree – An additional 12 credits Humanities and Social Sciences and proficiency at the second year level in a modern foreign language. *		12
Bachelor of Science (BS) Degree – An additional 6 credits in Humanities or Social Sciences *		6

* Humanities and Social Sciences may be fulfilled by any course having the following prefix: ADHM, ANTH, ARCH, ART, CJ, CLAS, COMM, ECON, ENGL, FREN, GEOG, GERM, HDFS, HIST, LA, LANG, MUSC, PHIL, POLS, PSYC, RELS, SOC, SPAN, THEA, WGS, or any course from the approved list of general education courses in humanities and social sciences (general education categories A and B). These credits must come from outside the department of the student's major.

Major Requirements

Code	Title	Credits
Biochem & Molecular Biology Requirements		
BIOC 460	Foundations of Biochemistry and Molecular Biology I	3
BIOC 460L	Foundations of Biochemistry I Laboratory	1
BIOC 461	Foundations of Biochemistry and Molecular Biology II	3
BIOC 473	Methods of Biochemical Research	3
BIOC 474	Methods of Recombinant DNA Technology	3
BIOC 483	Cellular Signal Transduction Processes and Metabolic Regulations	3
BIOC 487	Molecular Biology of Gene Expression	3
BIOL 150 & 150L	General Biology I and General Biology I Laboratory	4
Select one of the following:		4
CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory	
CHEM 150 & CHEM 160	Principles of Chemistry I and Principles of Chemistry Laboratory I	
Select one of the following:		4
CHEM 122 & 122L	General Chemistry II and General Chemistry II Laboratory	
CHEM 151 & CHEM 161	Principles of Chemistry II and Principles of Chemistry Laboratory II	
CHEM 341	Organic Chemistry I	3
CHEM 342	Organic Chemistry II	3
CHEM 353	Majors Organic Chemistry Laboratory I	1
CHEM 354	Majors Organic Chemistry Laboratory II	2
CHEM 465	Survey of Physical Chemistry	4
CHEM 380	Chemistry Junior Seminar	1
CHEM 431	Analytical Chemistry I	3
CHEM 491	Seminar	2
ENGL 321 or ENGL 324	Writing in the Technical Professions (May satisfy general education category C) Writing in the Sciences	3
MATH 165	Calculus I (May satisfy general education category R)	4
MATH 166	Calculus II	4
MICR 350 & 350L	General Microbiology and General Microbiology Lab	5
PHYS 251 & 251L	University Physics I and University Physics I Laboratory (May satisfy general education category S)	5
PHYS 252 & 252L	University Physics II and University Physics II Laboratory (May satisfy general education category S)	5
STAT 330	Introductory Statistics (May satisfy general education category R)	3
ZOO 315	Genetics (May satisfy general education category S)	3
Upper-Level Science Electives		
300-400 level courses in BIOL, BIOC, BOT, ZOO, CHEM, CSCI, MICR, PSCI, PHYS, PPTH, or STAT. No more than 6 credits from one prefix may apply. Research credits (CHEM 494/BIOC 494) may count towards 3 of these credits.		9
Total Credits		91

* CHEM 364 Physical Chemistry I & CHEM 365 Physical Chemistry II will satisfy this requirement and 2 credits of upper-level science electives.

Degree Notes:

- Except for courses offered only as pass/fail grading, no course may be taken Pass/Fail.

Minor Requirements

Biochemistry Minor

Minor Requirements

Required Credits: 16

Code	Title	Credits
Required Courses		
All minor courses must be selected in consultation with a Biochemistry adviser.		16
Total Credits		16

Minor Requirements and Notes

- A minimum of 8 credits must be taken at NDSU.
- The student and adviser will complete a substitution form with the courses to be used for the biochemistry minor. This form will also require the signature of the department chairperson before being submitted to the Office of Registration and Records for verification of minor program completion.
- Note: This minor will not be available for view in the Student Advisement/Requirement Report in Campus Connection.