

# Biochemistry

Biochemistry is a challenging field in which complex chemical processes that take place in living organisms are investigated. Biochemists might study the molecules and chemical reactions of reproduction, growth, heredity, or general metabolism. Biochemistry is considered an interdisciplinary major at Northern, meaning that students take courses from the Biology, Chemistry, Math & Computer Science, and Physics departments. A baccalaureate degree in Biochemistry prepares students for entry into graduate programs in chemistry, biochemistry, health science, and entry level positions as a scientist in the work force.

The background you get from receiving a degree in Biochemistry is sufficient to prepare you for a wide range of career possibilities, including science, medicine, forensics, teaching, and writing.

## Skills and Competencies

The Biochemistry major at NMU is a competitive program that gives you the opportunity to become acquainted with several subjects. It is necessary to have good math skills along with the ability to grasp concepts in physics, biology, and chemistry. Along with this, it is always encouraged to experience one or two computer courses, since research analysis is now being done on computers. The course work and challenging lab work will prepare you for any field that requires discipline, self-management, patience, and careful study.

## Course Work

This degree includes the following courses as part of the program requirements, and specific major requirements along with general education courses and graduation requirements.

### Chemistry

CH111	General Chemistry I (5 cr.)
CH112	General Chemistry II (5 cr.)
CH241	Chemical Equilibrium (3 cr.)
CH242	Quantitative Analysis (2 cr.)
CH315	Organic Chemistry I (3 cr.)
CH317	Organic Chemistry Lab I (1 cr.)
CH325	Organic Chemistry II (3 cr.)
CH327	Organic Chemistry Lab II (1 cr.)
CH342	Physical Chemistry II (4 cr.)
CH450	Biochemistry I (4 cr.)
CH452	Biochemistry II (4 cr.)
CH454	Biochemical Techniques (4 cr.)
CH479	Graduate Assessment for Chemistry (0 cr.)

### Biology

BI111	Introductory Biology: Principles (4 cr.)
BI112	Introductory Biology: Diversity (4 cr.)
BI303	General Microbiology (5 cr.) <i>or</i> BI406 Advanced Cell Biology (4 cr.) <i>or</i> BI431 Plant Physiology (4 cr.) <i>or</i> BI418 Molecular Biology (4 cr.)

### Other Required Courses

MA 161	Calculus I (4 cr.)
MA163	Calculus II (4 cr.)
PH220	Introductory Physics I (5 cr.) <i>or</i> PH201 College Physics I (5 cr.)
PH221	Introductory Physics II (5 cr.) <i>or</i> PH202 College Physics II (5 cr.)

### Biochemistry Electives (13 cr.)

Students can individualize their program by selecting elective courses from Biology, Chemistry, Math or Physics, Academic Information Services, and computer science.

*Detailed course descriptions can be found at [www.nmu.edu/bulletin](http://www.nmu.edu/bulletin).*

## Career Development

You should begin the resume-building process as soon as you can. The Academic and Career Advisement Center can assist you with career planning, while Career Services will help you fine tune your resume and look for jobs related to your field. In the meantime, the more hands-on experience you have, the better the chances are that you will find a job or undergraduate research. Becoming involved in a professional related internship is a way to develop your professional skills and gain experience. Your academic course work is important as well, so be sure to maintain a high grade point average.

## Additional Considerations

During your time at Northern, the more hands-on experience you have, the better the chances are that you will find a job. Participating in a faculty-led research project is the best way to gain practical experience on campus. We have two research courses, CH 490 and CH 491, which allow you to earn college credit towards your degree while gaining hands-on experience. Becoming involved in a career-related internship is another way to develop your professional skills and gain experience. The department hires student workers for its chemical stockroom—another way one can gain practical experience and also earn money for school. There is an active student chemistry club which is involved in K-12 outreach activities as well as other career preparation events. Finally, your academic course work is important as well, so be sure to maintain a high grade point average.

## Job Outlook

Over the next 10 years, jobs for Biochemists are expected to grow 6 percent. The median salary's for experienced Biochemists is \$83,100 while entry level positions with a bachelor's degree are around \$40,000-45,000. Earning an advanced degree will improve your earning potential.

## Potential Careers

NMU's Biochemistry Program prepares students for employment in the following careers:

- Agricultural Technologist
- Bacteriologist
- Biotechnologist
- Brewing Analyst
- Chemist
- Editor/Writer
- Environmental Scientist
- Food Analyst
- Forensic Scientist
- Lab Manager
- Marine Scientist
- Medical Researcher
- Paper Chemist
- Patent Expert
- Pharmacist
- Physician/Dentist/Veterinarian
- Salesperson
- Teacher
- Toxicologist

## Additional Resources and Information

For Career Planning and Opportunities:  
Academic & Career Advisement Center  
3302.1 C.B. Hedgcock  
906-227-2971  
[www.nmu.edu/acac](http://www.nmu.edu/acac)

Chemistry Department  
3301 New Science Facility  
906-227-2911  
[www.nmu.edu/chemistry](http://www.nmu.edu/chemistry)

For Job Search, Resume and Career Information:  
Career Services  
3302.3 C.B. Hedgcock  
906-227-2800  
[www.nmu.edu/careers](http://www.nmu.edu/careers)

For Information about NMU Student Organizations Associated with this Major Contact:  
Center for Student Enrichment  
1206 University Center  
906-227-2439  
[www.nmu.edu/cse](http://www.nmu.edu/cse)

Chemistry Club;  
(on Facebook as "NMU Chemistry Club")  
Forensic Biochemistry Club

Internet Resource Links:  
[www.careers.org](http://www.careers.org)  
[www.bls.gov](http://www.bls.gov)

For Career Information with National Organizations:  
[www.aibs.org](http://www.aibs.org) -American Institute of Biological Sciences  
[www.acs.org](http://www.acs.org) -American Chemical Society  
[www.faseb.org](http://www.faseb.org) -Federation of American Societies for Experimental Biology



**NORTHERN MICHIGAN  
UNIVERSITY**

MARQUETTE, MICHIGAN

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What to do with  
a major in...

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