

## Pre-Optometry

Pre-optometry students who are residents of Michigan normally plan an academic program of three or more years to meet requirements for admission to the College of Optometry at Ferris State University. Those requirements can be completed at Northern Michigan University, specifically courses in biology, chemistry, mathematics, physics, psychology, behavioral science, English and humanities. Pre-professional course requirements for the other American optometry schools can also be completed at NMU.

Students are encouraged to complete a bachelor's degree at Northern by pursuing a regular major in fields related to optometry, such as biochemistry, biology, mathematics, physics, chemistry or psychology. Students interested in the pre-optometry program should contact an adviser in the Biology Department.

### Pre-Optometry Courses

SP100 Public Address or  
SP 110 Interpersonal Communication (4 cr.)  
BI111 Introductory Biology: Principles (4 cr.)  
BI112 Introductory Biology: Diversity (4 cr.)  
BI207 Human Anatomy and Physiology I (4 cr.)  
BI208 Human Anatomy and Physiology II (4 cr.)  
BI203 Medical Microbiology (3-5 cr.)  
CH111 General Chemistry I (5 cr.)  
CH112 General Chemistry II (5 cr.)  
CH450 Biochemistry I (4 cr.)  
MA111 College Algebra for Calculus Prep (4 cr.)  
MA115 Pre-calculus (4 cr.)  
MA161 Calculus I (5 cr.)  
DATA109 Intro to Probability and Statistics (4 cr.)  
PH201 College Physics I (5 cr.) and  
PH202 College Physics II (5 cr.) or  
PH220 Introductory Physics I (5 cr.) and  
PH221 Introductory Physics II (5 cr.)  
Behavioral Science Electives (6 cr.)

\*Additional courses are dependent upon the intended institution.

## Pre-Pharmacy

Students wishing to pursue a career in pharmacy must complete a doctor of pharmacy program. NMU offers all prerequisite courses necessary for entry into a Pharm D. program. The actual doctor of pharmacy must be earned at one of the nation's pharmacy schools. Within Michigan, the doctor of pharmacy degree (Pharm.D.) is available at Ferris State University, the University of Michigan and Wayne State University. Another option, the Ph.D. in pharmacy, is also available at the University of Michigan and Wayne State University, but this degree requires earning a bachelor's degree first. The specific courses students take in the pre-pharmacy program at Northern Michigan University will vary depending on which pharmacy schools are targeted. However, some of the courses that are common to many pharmacy schools are listed below. Specific requirements and pharmacy school admission procedures can be explained in detail by an adviser from the Chemistry Department.

### Pre-Pharmacy Courses

BI 111 Introductory Biology: Principles (4 cr.)  
BI 112 Introductory Biology: Diversity (4 cr.)  
BI 203 Medical Microbiology with Lab (5 cr.)  
CH 111 General Chemistry I (5 cr.)  
CH 112 General Chemistry II (5 cr.)  
MA 161 Calculus I (5 cr.)

\*Additional course work is dependent upon the intended pharmacy school.

*Full program details can be found at [www.nmu.edu/bulletin](http://www.nmu.edu/bulletin)*

## Pre-Veterinary

Pre-veterinary students who are residents of Michigan normally plan an academic program to meet requirements for admission to the College of Veterinary Medicine at Michigan State University. Students interested in applying to this and other programs in most cases can meet the necessary specified pre-requisites through the course offerings at NMU, and they receive advising to help them plan their undergraduate course of study accordingly. Students are encouraged to earn a bachelor's degree at Northern Michigan University by completing a major in such fields as biology, biochemistry, chemistry, mathematics or psychology. Other majors are acceptable as long as the specified courses are completed. Additional helpful information can be found in the AAVMC Veterinary Medical School Admission Requirement Handbook (Purdue Press), which is available in the Biology Department and through your pre-veterinary advisor. Although standardized tests such as the Graduate Records Exam (GRE) are no longer being required for admission to most veterinary schools, important factors considered include state of legal residency, overall grade point average, science-specific grade point average, and ample veterinary experience. Increasingly for many schools, extracurricular research/ laboratory experience is also considered advantageous.

#### Biology Courses:

BI 111 Introductory Biology: Principles (4 cr.)  
BI 112 Introductory Biology: Diversity (4 cr.)

#### Advanced Biology Elective:

BI 203 Medical Microbiology (3-5 cr.) or BI 303 General Microbiology (5 cr.) or BI 218 Intro to Cell and Molecular Bio (4 cr.) or BI312 Genetics (4 cr.) or BI 327 Animal Physiology (4 cr.) or BI 405 Immunology (4 cr.) or BI 406 Advanced Cell Biology (4 cr.) or BI 419 Biology of Cancer (4 cr.) or BI 420 Neuroscience (4 cr.) or BI 425 Endocrinology (4 cr.) or BI 312 Genetics (4 cr.)

#### Chemistry Courses:

CH111 General Chemistry I (5 cr.), CH112 General Chemistry II (5 cr.), CH315 Organic Chemistry I (3 Cr.), CH316 Organic Chemistry Discussion (1 cr.), CH317 Organic Chemistry Lab (1 cr.), CH325 Organic Chemistry II (3 cr.), CH326 Organic Chemistry II Discussion(1 cr.), CH327 Organic Chemistry Laboratory II (1 cr.), CH450 Biochemistry I (4 cr.)

#### Physics Courses; Choose from:

PH 201 College Physics I (5 cr.) and  
PH 202 College Physics II (5 cr.) or  
PH 220 Introductory Physics I (5 cr.) and  
PH 221 Introductory Physics II (5 cr.)

Other Courses: English, Social Science, and Arts and Humanities courses are also required.

# Pre-Professional Programs

Northern Michigan University offers a number of Pre-professional programs through various departments on campus. Although they are not academic majors, these programs provide relevant skills and program admission criteria to students wishing to further their education at other institutions. No degrees are awarded, however.

Advising for each of the Pre-Professional programs is given through the respective sponsoring departments, and is also offered during the entirety of the curriculum. This is to ensure that students and their faculty advisers share important information and avoid confusion regarding future enrollment at other institutions. Advisers will also help students entry into the professional program of their choice.

These programs are a great opportunity for students with specific career aspirations to get a solid start on their formal education. Because of the nature of the programs, a great deal of communication between institutions is required. The motivated student will initiate correspondence with respective institutions to ensure transition from school to school.

# 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)

Pre-Optometry and Pre-Veterinary Programs  
2001 New Science Facility  
(Biology Department)  
906-227-2310  
[www.nmu.edu/biology](http://www.nmu.edu/biology)

Pre-Pharmacy  
3301 New Science Facility (Chemistry Depart.)  
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)

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

For Career Information with National Organizations:  
[www.natoptassoc.org](http://www.natoptassoc.org) Nat. Optometric Assoc.  
[www.amva.org](http://www.amva.org) American Veterinary Association  
[www.pharmacist.com](http://www.pharmacist.com) Am. Pharmacists' Assoc.



**NORTHERN MICHIGAN  
UNIVERSITY**

The Academic & Career Advisement Center  
2022



What to do with  
a major in...

**Pre-Professional**  
Pre-Optometry  
Pre-Pharmacy  
Pre-Vet

