

Pre-Professional Guides

Pre-Medicine

Advisor: Dr. Robert Crackel

Pre-medicine is not a major, it is a program of study which prepares a student to apply to medical school. Although some medical schools require only three years of undergraduate work, the majority prefer that the entering student have a bachelor's degree. The University of North Dakota (UND) Medical School (and most others) does not specify a particular academic major prospective students should pursue, but requires a particular core of coursework is completed. Prospective university medical students are strongly urged to declare a major area of study and to pursue a degree program at the baccalaureate level. The philosophy of education, required pre-medicine courses, and systems of training vary among the medical schools. All recognize the desirability of a broad education, a good foundation in the natural sciences (mathematics, chemistry, biology, physics), highly developed communication skills, and a solid background in the social sciences and humanities. At the UND School of Medicine the suggested minimum preparatory coursework includes:

BIOL 150 & BIOL 151	General Biology I and General Biology II	8
CHEM 121 & CHEM 122	General Chemistry I and General Chemistry II	10
CHEM 341 & CHEM 342	Organic Chemistry I and Organic Chemistry II	10
CHEM 481 & CHEM 482	Biochemistry I and Biochemistry II	6
ENGL 110 & ENGL 120	College Composition I and College Composition II	6
MATH 103	College Algebra	4
PHYS 211 & PHYS 212	College Physics I and College Physics II	8
PSY 111	Introduction to Psychology	3
SOC 110	Introduction to Sociology	3
One or two upper level Biology courses emphasizing concepts applicable to human biology.		
An upper level intensive-writing course		

Total Hours **58**

Other medical schools have similar requirements but their catalogs should be consulted. It is recommended that pre-med students at Minot State take more than the minimum requirements. Serious students should, in addition, consider courses such as:

BIOL 202	Introductory Microbiology	4
BIOL 220 & BIOL 221	Anatomy and Physiology I and Anatomy and Physiology II	8
BIOL 215	Genetics	4
BIOL 335	Comparative Vertebrate Anatomy	4
BIOL 440	Pre-Med Practicum	3
CHEM 480L	Biochemistry Laboratory	2
MATH 210	Elementary Statistics	4
Total Hours		29

Pre-med students are also encouraged to take part in an undergraduate research project while at Minot State. High school students wishing to follow a pre-med track as an undergraduate should take at least one year each of biology, chemistry, and physics, and two or more years of math while in high school in order to be prepared for college coursework.

Non-degree advising: Pre-Medicine

Freshman	Hours
CHEM 121	5
CHEM 122	5
ENGL 110	3
ENGL 120	3

MATH 103	4
BIOL 150	4
BIOL 151	4
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Sophomore	Hours
CHEM 341	5
CHEM 342	5
COMM 110	3
BIOL 202	4
BIOL 215	4
PSY 111	3
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	28
Junior	Hours
PHYS 211	4
PHYS 212	4
CHEM 481	3
CHEM 482	3
MATH 210	4
BIOL 220	4
BIOL 440	3
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	25
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Total Hours: 77	

This is a non-degree program. General Education categories are shown for appropriate courses for information only. There is no requirement that these students complete the MSU General Education requirements, nor is there any requirement that they earn 120 cr.

Pre-Optometry

Advisors: Dr. Robert Crackel

Admission to a college of optometry requires a high school diploma and two to four years of study at an accredited college or university. Most students accepted to colleges of optometry have completed three years of college and a large percentage have bachelor's degrees. In high school the students should take at least one year of biology, chemistry, and physics, and should take as much mathematics as possible, including algebra, geometry, and trigonometry. The curriculum at the University will depend on the individual student's interest and the college of optometry where the student plans to apply. Each student will take a minimum of one year of biology, chemistry, physics, mathematics, and English. Students planning to seek tuition support from North Dakota for out of state schools should notify both the North Dakota State Board of Higher Education and their University advisor.

Non-degree advising: Pre-Optometry

Freshman	Hours
CHEM 121 (& CHEM 121L)	5
CHEM 122 (& CHEM 122L)	5
BIOL 150	4
BIOL 202	4
ENGL 110	3
ENGL 120	3
MATH 103	4
MATH 107	4
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	32
Sophomore	Hours
BIOL 220	4
BIOL 221	4
CHEM 341	5
CHEM 342	5
PHYS 211	4
PHYS 212	4

MATH 165	4
COMM 110	3
PSY 111	3
	36

Total Hours: 68

This is a non-degree program. General Education categories are shown for appropriate courses for information only. There is no requirement that these students complete the MSU General Education requirements, nor is there any requirement that they earn 120 cr.

Pre-Pharmacy

Advisors: Dr. Robert Crackel, Dr. Mikhail Bobylev

The majority of colleges of pharmacy require students to have a minimum of two years of study at an accredited college or university prior to admission. An increasing number of pharmacy colleges are requiring a four-year degree for admission. The Pre-Pharmacy program at Minot State is designed to meet the interests of students as well as to satisfy the entrance requirements for the particular pharmacy school. Admission into a school of pharmacy is on a competitive basis. The criteria for admission include grade point average (especially in the sciences), performance on the pharmacy collage admission test (PCAT), and relevant experience in the field of pharmacy. The only school of pharmacy in North Dakota is at North Dakota State University. Courses that satisfy the Pre-Pharmacy curriculum at NDSU include Microbiology, General Biology I and II, Anatomy and Physiology I and II, General Chemistry I and II, Organic Chemistry I and II, Biochemistry I and II, Microeconomics, College Composition I and II, Applied Calculus, Statistics, Physics I, Fundamentals of Public Speaking, and a course in Science Writing. Other pharmacy schools have similar requirements but their catalogs should be consulted. It is recommended that pre-pharmacy students at Minot State take more than the minimum requirements.

Non-degree advising: Pre-Pharmacy

Freshman	Hours
CHEM 121	5
CHEM 122	5
BIOL 150	4
BIOL 151	4
ENGL 110	3
ENGL 120	3
MATH 146	3

27

Sophomore	Hours
BIOL 220	4
BIOL 221	4
CHEM 341	5
CHEM 342	5
PHYS 211	4
COMM 110	3
ECON 201	3
MATH 210	4

32

Junior	Hours
BIOL 302	4
ENGL 315	3
CHEM 481	3
CHEM 482	3

13**Total Hours: 72****Pre-Veterinary Medicine**

Advisor: Dr. Robert Crackel

It is suggested that students interested in applying to veterinary school pursue a degree in one of the sciences and take specific courses to meet admission requirements. Note that admission to veterinary school is highly competitive. Students planning to seek tuition support from the state of North

Dakota should notify both the North Dakota State Board of Higher Education Office and their advisor. Although specific requirements vary, the following list of Minot State courses based on the University of Minnesota list is typical:

CHEM 121 & CHEM 122	General Chemistry I and General Chemistry II	10
CHEM 341 & CHEM 342	Organic Chemistry I and Organic Chemistry II	10
CHEM 481 & CHEM 482	Biochemistry I and Biochemistry II	6
BIOL 215	Genetics	4
PHYS 211 & PHYS 212	College Physics I and College Physics II	8
MATH 103	College Algebra	4
MATH 210	Elementary Statistics	4
ENGL 110	College Composition I	3
ENGL 120	College Composition II	3
BIOL 150	General Biology I	4
BIOL 151	General Biology II	4

Non-degree advising: Pre-Veterinary Medicine

Freshman	Hours	
CHEM 121		5
CHEM 122		5
BIOL 150		4
BIOL 151		4
MATH 103		4
ENGL 110		3
ENGL 120		3
		28
Sophomore	Hours	
CHEM 341		5
CHEM 342		5
BIOL 202		4
BIOL 215		4
MATH 210		4
		22
Junior	Hours	
CHEM 481		3
CHEM 482		3
PHYS 211		4
PHYS 212		4
		14
Total Hours: 64		

This is a non-degree program. General Education categories are shown for appropriate courses for information only. There is no requirement that these students complete the Minot State General Education requirements, nor is there any requirement that they earn 120 cr.