PRE-PROFESSIONAL PROGRAMS

The purpose of pre-professional programs is to provide students with the intellectual and academic backgrounds they will need before continuing their education in degrees not offered at Minnesota State Mankato. Acceptance to professional educational institutions is contingent upon academic performance, so students enrolling in pre-professional programs should be highly motivated and realize they are expected to maintain standards of excellence. Advisors play an important role in guiding the students enrolled in such programs so students are urged to contact the advisor before enrolling.

PRE-CHIROPRACTIC
College of Science, Engineering & Technology
Advisor: Jim Rife, Ph.D.

Required General Education (33 credits)
CMST 102 Public Speaking (3)
ENG 101 Composition (4)
MATH 112 College Algebra (4)*
MATH 113 Trigonometry (3)*
PSYC 101 Introduction to Psychological Science (4)

An additional 15 elective credits from Humanities or Social Sciences

Recommended Support Courses (3 credits)
HLTH 321 Medical Terminology (3)

Required for Major (Core, 34-35 credits)
BIOL 105 General Biology I (4)
BIOL 106 General Biology II (4)
CHEM 201 General Chemistry I (5)
CHEM 202 General Chemistry II (5)
PHYS 211 Principles of Physics I (4)
PHYS 212 Principles of Physics II (4) OR
HP 348 Structural Kinesiology and Biomechanics (3)

Required Electives (16 credits)
A minimum of 90 hours are required to complete this program. The student should consult with the pre-chiropractic advisor in selecting the remaining 20 elective credits.

* There are no requirements for mathematics in this program; however, the student needs prerequisites in mathematics to take the courses in chemistry and physics.

This program meets the requirements for admission to most chiropractic schools. Students in the pre-chiropractic program should regularly consult with the pre-chiropractic advisor, since admissions requirements are subject to change.

PRE-DENTAL
College of Science, Engineering & Technology
Advisory Team: M. Bentley, Ph.D., (for biology majors)
M. Pomije, Ph.D. (for chemistry)

Specific course requirements for admission to dental school vary somewhat among the different dental schools in the United States. To be eligible for admission at a particular dental school, the student must fulfill the requirements of that school. Students are encouraged to keep themselves apprised of requirements for specific schools by consulting appropriate websites.

* The following list of courses is consistent with the courses required for admission to the University of Minnesota Dental School.

English. ENG 101, CMST 100 and an additional 4 credits of writing intensive course work in English. (Students are encouraged to take ENG 271W and PHIL 222W as electives)

Biology. BIOL 105, BIOL 106 - students are encouraged to take additional electives from the following list to enhance their knowledge in basic biology: BIOL 211, BIOL 220, BIOL 270, BIOL 316, BIOL 320, BIOL 330, BIOL 435, BIOL 475

Physics. PHYS 211, PHYS 212 or PHYS 221, PHYS 222

Chemistry. CHEM 201, CHEM 202, CHEM 322, CHEM 324, CHEM 325, CHEM 360. (Students are encouraged to take CHEM 305 as an elective).

Mathematics. PSYC 101

Although a minimum of 87 semester credits are required for admission to the D.D.S. program at the University of Minnesota, most students enrolled have completed four or more years of college. To receive a baccalaureate degree from Minnesota State Mankato, the student must complete the requirements for general education, a major and possibly a minor. Dental schools look most favorably upon the academically well-rounded student who has a strong scholastic record and unique life experiences that engender a commitment to a career in dentistry. Students should pursue majors and minors in subjects of their own choosing, as dental schools accept applicants from all academic majors, provided admission prerequisites are met. Majoring in one of the sciences-biology, biochemistry, chemistry, physics etc.—has the advantage of incorporating many or all of the courses listed above. Furthermore, the technical language of dental school is derived primarily from the disciplines of biology, chemistry, physics, mathematics and psychology. Sciences must include both lecture and laboratory instruction. Courses in biology, chemistry, and physics may be considered outdated by dental schools if taken more than five years before the time of application. Elective courses should be selected to achieve as broad and liberal an education as possible. Students who plan to enter dental school must take the Dental Admission Test (DAT). Typically, students begin the application process to dental school during the summer following their junior year. For their application to be complete, they must report their DAT scores. Consult the website of the American Dental Education Association for more information on the DAT and the application process.

PRE-ENGINEERING
College of Science, Engineering & Technology
Advisor: CSET Advising Center

(choose one of the following options)

Minnesota State Mankato OPTION
These course guidelines are intended for those students who are uncertain of a specific engineering major, but plan to enter one of the Minnesota State Mankato engineering programs after their first academic year.

CMST 102 Public Speaking (3)
CHEM 201 General Chemistry I (5)
ECON 201 Principles of Macroeconomics (3) OR
ECON 202 Principles of Microeconomics (3)
ENG 101 Composition (4)
MATH 121 Calculus I (4)
MATH 122 Calculus II (4)
PHYS 221 General Physics I (4)

Transfer Option
These course guidelines are intended for students who plan to begin at Minnesota State Mankato and later transfer to another college or university engineering program. Engineering fields and institutions differ in their requirements, and students should contact programs they wish to enter for guidance. Courses recommended below are “fairly” standard, but are not guaranteed to provide required preparation for any specific program. Students should discuss their plans with the CSET Advising Center AND particularly with the university (or universities) to which they plan to apply.

2015-2016 Undergraduate Catalog
CHEM 201 General Chemistry I (5)
CMST 102 Public Speaking (3)
ENG 101 Composition (4)
ENG 271W Technical Communications (4)
MATH 121 Calculus I (4)
MATH 122 Calculus II (4)
MATH 223 Calculus III (4)
PHYS 221 General Physics I (4)
PHYS 222 General Physics II (4)

PRE-LAW
Advisor: Dr. Kevin Parsneau, Ph.D.

A student’s grade-point average and score on the Law School Admission Test are the primary factors on which law schools base their admission decisions. Law schools generally do not require a particular major field or any particular prescribed courses as prerequisites for admission. Most law schools merely require a bachelor’s degree.

Students should select a major field which interests them to increase the likelihood of a high GPA, and to allow them to specialize in a field of law that most interests them. Even though no particular pre-law major is best for all students, there must be substantial academic content in the pre-law education. Students should supplement their major field by taking intellectually demanding courses that will develop broad educational foundations and mental skills required of the successful law student or lawyer the ability to analyze, reason, read carefully, think abstractly, and speak and write precisely. Elective courses might include U.S. government, U.S. history, philosophy, economics, communication, accounting, statistics, corporate finance, constitutional law, jurisprudence, logic, political theory, and at least one course in English composition beyond the first year level.

Students should contact the pre-law advisor for more detailed assistance on the manner in which their particular needs and interests may best be shaped into a suitable pre-law program.

The Pre-Law Association, a student-sponsored organization, is available for the purpose of encouraging communication and interaction among pre-law students on campus.

PRE-MEDICINE
College of Science, Engineering & Technology
Advisory Team: M. Bentley, Ph.D., G. Goellner, Ph.D., Marilyn Hart, Ph.D., R. Cohen, Ph.D.; D. Sharlin, Ph.D.; Toma, Ph.D. (for biology majors)
M. Pomije, Ph.D.(for chemistry and biochemistry majors)

Specific course requirements for admission to medical school vary somewhat among the different medical schools in the United States. To be eligible for admission at a particular medical school, the student must fulfill the requirements of that school. Students are encouraged to keep themselves informed of requirements for specific schools by consulting appropriate websites. A typical set of requirements are:

General Biology - (8 credits minimum)
BIOL 105 and BIOL 106

Students are encouraged to take additional electives from the following list to enhance their knowledge in basic biology: BIOL 211, BIOL 220, BIOL 270, BIOL 316, BIOL 320, BIOL 330, BIOL 435, BIOL 474

Chemistry with laboratory (general, inorganic and organic chemistry, 14 credits minimum)
General chemistry: CHEM 201, CHEM 202
Organic chemistry: CHEM 322 and CHEM 323 OR CHEM 322 and CHEM 324
Biochemistry: CHEM 360 OR CHEM 460
Students are encouraged to take CHEM 305 as an elective.

Physics with laboratory (8 credits minimum)
PHYS 211 and PHYS 212 OR PHYS 221 and PHYS 222

Mathematics (introductory course in calculus and upper level statistics)
MATH 121 and HLTH 475

English or literature (one year)
ENG 101, and an additional 4 credits of writing intensive coursework in English. Students are encouraged to take ENG 271W as an elective.

Social and Behavior Sciences and Humanities - (18 credits minimum)
Students are encouraged to include PSYC 101, SOC 101 and PHIL 222W among these electives.

The completion of a baccalaureate degree is required for admittance to a medical school in most cases. Medical schools look most favorably upon the academically well-rounded student who has a strong scholastic record and unique life experiences that engender a commitment to a career in medicine. Students should pursue majors in subjects of their own choosing, as medical schools accept applicants from all academic majors, provided admission prerequisites are met. Majoring in one of the sciences—biology, biochemistry, chemistry, physics, etc.,—has the advantage of incorporating many or all of the courses listed above. Furthermore, the technical language of medical science is derived primarily from the disciplines of biology, chemistry, physics, mathematics, and psychology. Students who plan to enter medical school must take the Medical College Admission Test (MCAT). Typically, students begin the application process to medical school during the summer following their junior year. For their application to be complete, they must report their MCAT scores. MCATs are offered on various dates throughout the year. Contact the website of the American Association of Medical Colleges for specifics. If you have questions, please contact your pre-medicine advisor.

PRE-MORTUARY SCIENCE
College of Science, Engineering & Technology
Advisor: Marie Slotemaker

Required for Program
ACCT 200 Financial Accounting (3)
BIOL 220 Human Anatomy (4)
ENG 101 Composition (4)
BIOL 100 Our Natural World (4) OR
BIOL 105 General Biology I (4)

Chem 100 Chemistry in Society (4) OR
CHEM 111 Chemistry of Life Process Part II (Organic & Biochemistry) (5) OR
CHEM 201 General Chemistry I (5)
STAT 154 Elementary Statistics (3) OR
PSYC 201 Statistics for Psychology (4)
SOC 101 Introduction to Sociology (3) OR
SOC 101W Introduction to Sociology (3)

CMST 100 Fundamentals of Communication (3) OR
CMST 101W Interpersonal Communication (4)

Recommended for Program
HLTH 101 Health & the Environment (3)
HLTH 321 Medical Terminology (3)

Additional electives to meet the 60 credit transfer requirement.

This program has been designed to meet the transfer requirements of the University of Minnesota’s Mortuary Science Program. Completion of the MN Transfer Curriculum or the Associate of Arts Degree is recommended before students enroll in the Mortuary Science B.S. program. The transfer program requires a total of 60 semester credits completed while maintaining a minimum GPA of 2.5 on a 4.0 scale. The courses listed above are specified by the University of Minnesota; additional courses should be selected with the help of an advisor.

2015-2016 Undergraduate Catalog
The American Board of Funeral Service Education (ABFSE) accredits Mortuary Science Programs throughout the United States. Accredited programs are found on their Website: www.abfse.org. Students interested in Mortuary Science are strongly encouraged to consult the Website to locate programs in their geographic area of interest and then to consult with an advisor at that institution in their first year.

**PRE-OCCUPATIONAL THERAPY**

Advisor: Mary Visser, PhD  
mary.visser@mnsu.edu  
Phone: 507-389-2672

Student Relations Coordinator: Shirley Murray  
shirley.murray@mnsu.edu  
Phone: 507-389-5194

The Pre–Occupational Therapy curriculum is a natural and social science–oriented curriculum which meets the standard requirements for admission to most occupational therapy programs. The majority of schools require a Bachelor’s degree prior to application for admission, although some still accept students following two or three years of college preparation. It is important that students check requirements for their professional school of choice as some require classes in addition to those contained in this concentration. Most programs also require that the student take the Graduate Record Examination and score at a certain level.

### Pre-Occupational Therapy Concentration Courses at Minnesota State Mankato

- **BIOL 220** Human Anatomy (4)
- **BIOL 330** Principles of Human Physiology (4)
- **STAT 154** Elementary Statistics (3)
- **CHEM 106** Chemistry of Life Process Part I (General) (3) OR
- **CHEM 111** Chemistry of Life Process Part II (Organic & Biochemistry) (5)
- **PSYC 101** Introduction to Psychological Science (4)
- **PSYC 433** Child Psychology (4) AND
- **PSYC 436** Adolescent Psychology (4) OR
- **KSP 235** Human Development (3)
- **PSYC 545** Abnormal Psychology (4)
- **SOC 101** Introduction to Sociology (3)
- **HLTH 321** Medical Terminology (3)
- **HP 265** Orientation to Occupational and Physical Therapy (2)

**TOTAL:** 32-39 credits

AOTA Website for Accredited OT Programs: [http://www.aota.org/Educate/Schools/EntryLevelOT/38119.aspx](http://www.aota.org/Educate/Schools/EntryLevelOT/38119.aspx)

*Be sure to check the specific pre-requisite courses of programs you plan to apply to and tailor the above list to meet those requirements.

### Majors to Consider with Occupational Therapy Concentration:

- Exercise Science
- Health Science: Community Health
- Psychology
- Child Development and Family Studies
- Biology

*Graduate programs generally do not specify what undergraduate major must be completed. They are concerned about your performance within the major (including GPA) and that you have successfully completed all pre-requisite coursework.

---

**PRE-OPTOMETRY**

College of Science, Engineering & Technology  
Advisor: Mike Lusch, Ph.D.

The following courses satisfy requirements for admission to most colleges and schools of optometry. By the end of their first year at Minnesota State Mankato however, students should check the specific requirements of the college or school of optometry they plan to attend to ascertain exactly what is required for admission. Completion of a bachelor’s degree may be needed to be admitted to optometry schools and colleges.

- **BIOL 220** Human Anatomy (4)
- **BIOL 270** Microbiology (4)
- **BIOL 330** Principles of Human Physiology (4)
- **CHEM 201** General Chemistry I (5)
- **CHEM 202** General Chemistry II (5)
- **CHEM 322** Organic Chemistry I (4)
- **CHEM 323** Supplemental Organic Functional Group Chemistry (1)
- **CHEM 360** Principles of Biochemistry (4)
- **ENG 101** Composition (4)
- **ENG 271W** Technical Communication (4)
- **MATH 112** College Algebra (4) AND
- **MATH 113** Trigonometry (3) OR
- **MATH 115** Pre-Calculus Mathematics (4)
- **MATH 121** Calculus I (4)
- **PHYS 211** Principles of Physics I (4)
- **PHYS 212** Principles of Physics II (4)
- **PSYC 101** Introduction to Psychological Science (4)
- **STAT 154** Elementary Statistics (3)

---

**PRE-OSTEOPATHIC MEDICINE AND SURGERY**

College of Science, Engineering & Technology  
Advisor: Jim Rife, Ph.D.

### Required General Education (12-15 credits)

- **ENG 101** Composition (4)
- **ENG 201W** Intermediate Writing (4)
- **MATH 112** College Algebra (4) AND
- **MATH 113** Trigonometry (3) OR
- **MATH 115** Pre-Calculus (4)
- **PSYC 101** Introduction to Psychological Science (4)
- **SOC 101** Introduction to Sociology (3)

### Required for Major (34 credits)

- **BIOL 105** General Biology I (4)
- **BIOL 106** General Biology II (4)
- **CHEM 201** General Chemistry I (5)
- **CHEM 202** General Chemistry II (5)
- **CHEM 322** Organic Chemistry I (4)
- **CHEM 324** Organic Chemistry II (5)
- **CHEM 325** Organic Chemistry II Lab (1)
- **CHEM 360** Principles of Biochemistry (4) OR
- **CHEM 460** Biochemistry II (3)
- **PHYS 211** Principles of Physics I (4)
- **PHYS 212** Principles of Physics II (4)

### Required Electives (40-43 credits)

Electives to yield a total of 90 semester credits are required.

Colleges of osteopathic medicine and surgery require a minimum of 90 semester hours for admission. Students admitted to a college of osteopathic medicine and surgery have completed undergraduate degrees. Students interested in osteopathic medicine will find that majoring in Biomedical Sciences (BS), or Biochemistry (BA or BS) will provide them with appropriate undergraduate training. The Medical College Admissions Test (MCAT) is required for all applicants to colleges of osteopathic medicine and surgery. Since admissions requirements vary, students should consult the advisor.
The majority of students admitted to a college of pharmacy have completed an undergraduate degree. Students interested in pharmacy often major in Biomedical Sciences (BS), Biochemistry (BA or BS), or Chemistry (BA or BS) because these majors include many of the same courses that are required prerequisites to pharmacy programs. The pre-pharmacy curriculum is designed to meet the prerequisites for admission to many pre-pharmacy schools, however the curriculum is not all inclusive as prerequisites vary between colleges of pharmacy. Therefore, requirements for particular pharmacy schools still need to be taken into consideration before substitutions for these courses are made. The Pharmacy College Admission Test (PCAT) is required for all applicants to colleges of pharmacy.

**Required for Program**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 105</td>
<td>General Biology I (4)</td>
</tr>
<tr>
<td>BIOL 220</td>
<td>Human Anatomy (4)</td>
</tr>
<tr>
<td>BIOL 270</td>
<td>Microbiology (4)</td>
</tr>
<tr>
<td>BIOL 330</td>
<td>Principles of Human Physiology (4)</td>
</tr>
<tr>
<td>CHEM 201</td>
<td>General Chemistry I (5)</td>
</tr>
<tr>
<td>CHEM 202</td>
<td>General Chemistry II (5)</td>
</tr>
<tr>
<td>CHEM 360</td>
<td>Principles of Biochemistry (4) OR</td>
</tr>
<tr>
<td>BIOL 211</td>
<td>Genetics (4) OR</td>
</tr>
<tr>
<td>BIOL 320</td>
<td>Cell Biology (4) OR</td>
</tr>
<tr>
<td>BIOL 479</td>
<td>Molecular Biology (4)</td>
</tr>
<tr>
<td>CMST 102</td>
<td>Public Speaking (3) OR</td>
</tr>
<tr>
<td>CMST 101W</td>
<td>Interpersonal Communications (4)</td>
</tr>
<tr>
<td>ECON 202</td>
<td>Principles of Microeconomics (3)</td>
</tr>
<tr>
<td>ENG 201W</td>
<td>Intermediate Writing (4) OR</td>
</tr>
<tr>
<td>ENG 271W</td>
<td>Technical Communication (4) OR</td>
</tr>
<tr>
<td>ENG 301W</td>
<td>Advanced Writing (4)</td>
</tr>
<tr>
<td>MATH 121</td>
<td>Calculus I (4)</td>
</tr>
<tr>
<td>PHYS 221</td>
<td>General Physics I (4) OR</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Principles of Physics I (4) AND</td>
</tr>
<tr>
<td>PHYS 212</td>
<td>Principles of Physics II (4)</td>
</tr>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychological Science (4)</td>
</tr>
<tr>
<td>STAT 154</td>
<td>Elementary Statistics (3) OR</td>
</tr>
<tr>
<td>STAT 354</td>
<td>Concepts of Probability &amp; Statistics (3) OR</td>
</tr>
<tr>
<td>MATH 354</td>
<td>Concepts of Probability &amp; Statistics (3)</td>
</tr>
</tbody>
</table>

Sixty to 64 credits of coursework including the above are typically required by pharmacy programs. Substitutions for both science and non-science courses should be chosen after studying the requirements of particular pharmacy schools. Please contact a pre-pharmacy advisor.

**Recommended Support Courses**

- MATH 354 Concepts of Probability & Statistics (3)
- STAT 154 Elementary Statistics (3)
- CMST 101W Interpersonal Communications (4)
- CMST 101W Interpersonal Communications (4)

*Be sure to check the specific pre-requisite courses of programs you plan to apply to and tailor the above list to meet those requirements.

**Pre-Physical Therapy Concentration Courses at Minnesota State Mankato**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 105</td>
<td>General Biology I (4)</td>
</tr>
<tr>
<td>BIOL 106</td>
<td>General Biology II (4)</td>
</tr>
<tr>
<td>BIOL 220</td>
<td>Human Anatomy (4)</td>
</tr>
<tr>
<td>BIOL 330</td>
<td>Principles of Human Physiology (4)</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Principles of Physics I (4)</td>
</tr>
<tr>
<td>PHYS 212</td>
<td>Principles of Physics II (4)</td>
</tr>
<tr>
<td>MATH 111</td>
<td>College Algebra (4) AND</td>
</tr>
<tr>
<td>MATH 113</td>
<td>Trigonometry (3) OR</td>
</tr>
<tr>
<td>MATH 115</td>
<td>Precalculus Mathematics (4)</td>
</tr>
<tr>
<td>(Must meet PHYS 211 math requirement (4-8)</td>
<td></td>
</tr>
<tr>
<td>STAT 154</td>
<td>Elementary Statistics (3)</td>
</tr>
<tr>
<td>CHEM 201</td>
<td>General Chemistry I (5)</td>
</tr>
<tr>
<td>CHEM 202</td>
<td>General Chemistry II (5)</td>
</tr>
<tr>
<td>PSYC 101</td>
<td>Introduction to Psychological Science (4)</td>
</tr>
<tr>
<td>PSYC 433</td>
<td>Child Psychology AND</td>
</tr>
<tr>
<td>PSYC 436</td>
<td>Adolescent Psychology OR</td>
</tr>
<tr>
<td>KSP 235</td>
<td>Human Development (3)</td>
</tr>
<tr>
<td>PSYC 455</td>
<td>Abnormal Psychology (4)</td>
</tr>
<tr>
<td>SOC 101</td>
<td>Introduction to Sociology (3)</td>
</tr>
<tr>
<td>ILTH 321</td>
<td>Medical Terminology (3)</td>
</tr>
<tr>
<td>HP 265</td>
<td>Orientation to Occupational and Physical Therapy (2)</td>
</tr>
</tbody>
</table>

**TOTAL:** 53-68 credits

**Pre-Physical Therapy Concentration:**

- Exercise Science
- Biology
- Health Science: Community Health

*Graduate programs generally do not specify what undergraduate major must be completed. They are concerned about your performance within the major (including GPA) and that you have successfully completed all pre-requisite coursework.

**Pre-Podiatric Medicine and Surgery**

- Exercise Science
- Biology
- Health Science: Community Health

The minimum requirements for admission to a college of podiatric medicine and surgery are the same as for osteopathic medicine and surgery. A minimum of 90 semester hours are required for admission; however, most students admitted to a college of podiatric medicine and surgery have completed undergraduate degrees. Students interested in podiatric medicine will find that majoring in Biomedical Sciences (BS), or Biochemistry (BA or BS) will provide them with appropriate undergraduate training. The Medical College Admissions Test is required for all applicants to colleges of podiatric medicine and surgery. Students in this program should regularly consult with the advisor.

**Required General Education (78 credits)**

- ENG 101 Composition (4)
- ENG 201W Intermediate Writing (4)
- PSYC 101 Introduction to Psychological Science (4)
- SOC 101 Introduction to Sociology (3)

**Recommended Support Courses (4-7 credits)**

- MATH 112 College Algebra (4) AND
- MATH 113 Trigonometry (3) OR
- MATH 115 Precalculus Mathematics (4)
### Required for Major (35 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 105</td>
<td>General Biology I (4)</td>
<td></td>
</tr>
<tr>
<td>BIOL 106</td>
<td>General Biology II (4)</td>
<td></td>
</tr>
<tr>
<td>CHEM 201</td>
<td>General Chemistry I (5)</td>
<td></td>
</tr>
<tr>
<td>CHEM 202</td>
<td>General Chemistry II (5)</td>
<td></td>
</tr>
<tr>
<td>CHEM 322</td>
<td>Organic Chemistry I (4)</td>
<td></td>
</tr>
<tr>
<td>CHEM 324</td>
<td>Organic Chemistry II (3)</td>
<td></td>
</tr>
<tr>
<td>CHEM 325</td>
<td>Organic Chemistry II Lab (1)</td>
<td></td>
</tr>
<tr>
<td>CHEM 360</td>
<td>Principles of Biochemistry (4)</td>
<td>OR</td>
</tr>
<tr>
<td>CHEM 460</td>
<td>Biochemistry II (3)</td>
<td></td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Principles of Physics I (4)</td>
<td></td>
</tr>
<tr>
<td>PHYS 212</td>
<td>Principles of Physics II (4)</td>
<td></td>
</tr>
</tbody>
</table>

### Required Electives (40-43 credits)

Electives to yield a total of 90 semester credits are required.

* There are no requirements for MATH in this program; however, the student needs prerequisites in math to take courses in chemistry and physics.

---

**PRE-VETERINARY MEDICINE**

*College of Science, Engineering & Technology*

**Advisor:** P. Knoblich D.V.M., Ph.D.

Specific course requirements for admission to veterinary schools vary somewhat. The following requirements are designed for application to the University of Minnesota Veterinary School. Students should use these requirements as a general guide and check specific requirements for other Veterinary Schools.

### Required for Major (Core, 49-53 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 101</td>
<td>Composition (4)</td>
<td></td>
</tr>
<tr>
<td>Plus: one additional course, such as speech, literature, advanced writing, technical writing, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 105</td>
<td>General Biology I (4)</td>
<td></td>
</tr>
<tr>
<td>BIOL 106</td>
<td>General Biology II (4)</td>
<td></td>
</tr>
<tr>
<td>BIOL 211</td>
<td>Genetics (4)</td>
<td></td>
</tr>
<tr>
<td>BIOL 270</td>
<td>Microbiology (4)</td>
<td></td>
</tr>
<tr>
<td>CHEM 201</td>
<td>General Chemistry I (5)</td>
<td></td>
</tr>
<tr>
<td>CHEM 202</td>
<td>General Chemistry II (5)</td>
<td></td>
</tr>
<tr>
<td>CHEM 322</td>
<td>Organic Chemistry I (4)</td>
<td></td>
</tr>
<tr>
<td>CHEM 323</td>
<td>Supplemental Organic Functional Group Chemistry (1)</td>
<td></td>
</tr>
<tr>
<td>CHEM 360</td>
<td>Principles of Biochemistry (4)</td>
<td></td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Principles of Physics I (4)</td>
<td></td>
</tr>
<tr>
<td>PHYS 212</td>
<td>Principles of Physics II (4)</td>
<td></td>
</tr>
</tbody>
</table>

(choose one of the following options)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 112</td>
<td>College Algebra (4)</td>
<td>AND</td>
</tr>
<tr>
<td>MATH 113</td>
<td>Trigonometry (3)* OR</td>
<td></td>
</tr>
<tr>
<td>MATH 115</td>
<td>Precalculus Mathematics (4)</td>
<td>OR</td>
</tr>
<tr>
<td>MATH 121</td>
<td>Calculus I (4)</td>
<td></td>
</tr>
</tbody>
</table>

*Although the University of Minnesota specifically requires only MATH 112, Minnesota State Mankato PHYS 111 requires either both MATH 112 and MATH 113, or MATH 115 or higher as prerequisites.*

### Required Electives (12-16 credits)

2 History and Social Sciences (6-8 credits)

2 Arts and Humanities (6-8 credits)

Organic chemistry: CHEM 322, plus CHEM 323

### Recommended Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 220</td>
<td>Human Anatomy (4) AND</td>
<td></td>
</tr>
<tr>
<td>BIOL 330</td>
<td>Principles of Human Physiology (4) OR</td>
<td></td>
</tr>
<tr>
<td>BIOL 431</td>
<td>Comparative Animal Physiology (3)</td>
<td></td>
</tr>
</tbody>
</table>