

## PRE-PROFESSIONAL PROGRAMS

### 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 educations 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-AGRICULTURE

*College of Science, Engineering & Technology*

**Advisors:** Alison Mahoney, Ph.D.

*Specific course requirements may vary based on the university and program area within agriculture. Students should identify their transfer institution early, and consult with advisors at that university.*

#### **Required for Program (56 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	320	Organic Chemistry I (5)
CHEM	321	Organic Chemistry II (3)
CMST	102	Public Speaking (3)
ENG	101	Composition (4)
ENG	271	Technical Communication (4)
ENG	285	Practical Grammar (2)
MATH	112	College Algebra (4) <b>AND</b>
MATH	113	Trigonometry (3) <b>OR</b>
MATH	115	Precalculus Mathematics (4)
PHYS	211	Principles of Physics I (4)
PSYC	101	Psychology (4)

#### PRE-CHIROPRACTIC

*College of Science, Engineering & Technology*

**Advisor:** Jim Rife

#### **Required General Education (26 credits)**

CMST	102	Public Speaking (3)
ENG	101	Composition (4)
PSYC	101	Psychology (4)

An additional 15 elective credits from Humanities or Social Sciences

#### **Recommended General Education (3 credits)**

HLTH	321	Medical Terminology (3)
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#### **Recommended Support Courses (7 credits)**

MATH	112	College Algebra (4)*
MATH	113	Trigonometry (3)*

#### **Required for Major (Core, 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)
CHEM	320	Organic Chemistry I (5)
CHEM	321	Organic Chemistry II (3)
CHEM	331	Organic Chemistry II Lab (1)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)

#### **Required Electives (20 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 adequate training in mathematics to take the courses in chemistry and physics.

This program meets the requirements for admission to the Northwestern College of Chiropractic in Bloomington MN. Other colleges may have different requirements. Students in the pre-chiropractic program should regularly consult with the pre-chiropractic advisor.

#### PRE-DENTAL

*College of Science, Engineering & Technology*

**Advisory Team:** M. Bentley, Ph.D., J. Thoenke, Ph.D., E. Williams, Ph.D.

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 Web site.

\* 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 271 and PHIL 222 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 230, BIOL 270, BIOL 316, BIOL 320, BIOL 435, BIOL 475)

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

**Chemistry.** CHEM 201, CHEM 202, CHEM 320, CHEM 321, CHEM 331, CHEM 360, (students are encouraged to take CHEM 305 as an elective).

**Mathematics.** MATH 112

**Psychology.** 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.

## PRE-PROFESSIONAL PROGRAMS

### PRE-ENGINEERING

*College of Science, Engineering & Technology*

**Advisor:** Louis Schwartzkopf, Ph.D.

Choose one of the following options:

#### Minnesota State Mankato OPTION

This option is open to students who will be entering the Engineering program at Minnesota State Mankato.

##### **Required General Education (17 credits)**

CHEM	201	General Chemistry I (5)
ENG	101	Composition (4)
MATH	121	Calculus I (4)
PHYS	221	General Physics I (4)

##### **Required Support Courses (11 credits)**

CS	171	Introduction to C++ Programming (2)
MATH	122	Calculus II (4)
ME	103	Computer Graphics Communication (1)

#### TRANSFER OPTION

This option is designed for students who plan to transfer from Minnesota State Mankato, after two years. Some engineering fields may require somewhat different courses or may not require all of these courses. Contact the pre-engineering advisor to obtain course listings for specific engineering fields at the University of Minnesota or other universities.

##### **Required General Education (17 credits)**

CHEM	201	General Chemistry I (5)
ENG	101	Composition (4)
MATH	121	Calculus I (4)
PHYS	221	General Physics I (4)

##### **Required Support Courses (33 credits)**

CHEM	202	General Chemistry II (5)
CS	171	Introduction to C++ Programming (2)
ENG	271	Technical Communication (4)
MATH	122	Calculus II (4)
MATH	223	Calculus III (4)
MATH	247	Linear Algebra I (4)
MATH	321	Ordinary Differential Equations (4)
PHYS	222	General Physics II (3)

##### **Required Core (8 credits)**

ME	103	Computer Graphics Communication (1)
ME	212	Statics (3)
ME	214	Dynamics (3)

### PRE-FORESTRY

*College of Science, Engineering & Technology*

**Advisor:** Alison Mahoney, Ph.D.

#### **First Year**

BIOL	105	General Biology I (4)
BIOL	106	General Biology II (4)
CHEM	201	General Chemistry I (5)
CHEM	202	General Chemistry II (5)
ENG	101	Composition (4)
MATH	112	College Algebra (4)
MATH	113	Trigonometry (3)

#### **Second Year**

CHEM	320	Organic Chemistry I (5)
CHEM	321	Organic Chemistry II (3)
CMST	102	Public Speaking (3)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)
PSYC	101	Psychology (4)

### PRE-LAW

**Advisor:** Scott Granberrg-Rademaker, 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 and which will provide them with a basis for an alternative vocational choice should their plans to finish law school not be realized. Even though no particular pre-law major is best for all students, there must be substantial academic content in the pre-law education. In addition, 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 accounting, statistics, corporate finance, constitutional law and history, jurisprudence, logic, political theory, and at least one course in English composition beyond the freshman 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., J. Thoenke, Ph.D., E. Williams, Ph.D., M. Pomije, Ph.D., Marilyn Hart, Ph.D.

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 web sites. A typical set of requirements are:

#### **General Biology or Zoology with laboratory - (7 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 230, BIOL 270, BIOL 316, BIOL 320, BIOL 435, BIOL 474

#### **Chemistry with laboratory (general, inorganic and organic chemistry, 14 credits minimum)**

General chemistry: CHEM 201, CHEM 202

Organic chemistry: CHEM 320, CHEM 321, CHEM 331

Biochemistry: CHEM 360

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 or upper level statistics)**

MATH 121 or 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 271 as an elective.

## PRE-PROFESSIONAL PROGRAMS

### Social and Behavior Sciences and Humanities - (18 credits minimum)

Students are encouraged to include PSYC 101 and PHIL 222 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:** Angie Bomier, CSET Advising Center

#### Required for Program

ACCT	200	Financial Accounting (3)
BIOL	105	General Biology I (4)
BIOL	220	Human Anatomy (4)
BIOL	230	Human Physiology (4)
CHEM	201	General Chemistry I (5)
CMST	102	Public Speaking (3)
ECON	202	Principles of Microeconomics (3)
ENG	101	Composition (4)
IT	100	Introduction to Computing and Applications (4)
MATH	112	College Algebra (4)
PSYC	101	Psychology (4)
SOC	101	Introduction to Sociology (3)
STAT	154	Elementary Statistics (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 enrol 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.

The American Board of Funeral Service Education (ABFSE) accredits Mortuary Science Programs throughout the United States. Accredited programs are found on their Web site: [www.abfse.org](http://www.abfse.org). Students interested in Mortuary Science are strongly encouraged to consult the Web site to locate programs in their geographic area of interest and then to consult with an advisor at that institution in their freshman year.

### PRE-OCCUPATIONAL THERAPY

**Advisor:** Mark Schuck

This pre-professional program encompasses the prerequisite courses needed to apply to most professional occupational therapy programs. These programs may accept students after their sophomore or junior year, or after obtaining a bachelor's degree in any area as long as all the listed prerequisite courses are completed.

#### Recommended Courses

ART	230	Fibers (3)
ART	231	Mixed Media (3)
ART	330	Fibers (3)
BIOL	100	Our Natural World (4)

BIOL	220	Human Anatomy (4)
BIOL	230	Human Physiology (4)
CMST	100	Fundamentals of Communication (3)
ENG	101	Composition (4)
HLTH	101	Health and the Environment (3)
HLTH	210	First Aid and CPR (3)
HLTH	321	Medical Terminology (3)
MATH	112	College Algebra (4)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)
PSYC	101	Psychology (4)
PSYC	433	Child Psychology (4) <b>OR</b>
PSYC	436	Adolescent Psychology (4)
PSYC	455	Abnormal Psychology (4)
SOC	101	Introduction to Sociology (3)
STAT	154	Elementary Statistics (3)
Choose one of the following		
CHEM	100	Chemistry in Society (4)
CHEM	104	Introduction to Chemistry (3)

### PRE-OPTOMETRY

*College of Science, Engineering & Technology*

**Advisor:** Mike Lusch, Ph.D.

The following prerequisite courses satisfy 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. A third year or a bachelor's degree may be needed to be admitted to some colleges.

#### First Year

BIOL	220	Human Anatomy (4)
BIOL	230	Human Physiology (4)
CHEM	201	General Chemistry I (5)
CHEM	202	General Chemistry II (5)
ENG	101	Composition (4)
MATH	112	College Algebra (4)
MATH	113	Trigonometry (3)
MATH	121	Calculus I (4)

#### Second Year

BIOL	270	Microbiology (4)
CHEM	320	Organic Chemistry I (5)
CHEM	360	Principles of Biochemistry (4)
ENG	271	Technical Communication (4)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)
PSYC	101	Psychology (4)
STAT	154	Elementary Statistics (3)

#### Third Year

ECON	100	An Introduction to the U.S. Economy (3)
POL	100	Introduction to Politics (3)

### PRE-OSTEOPATHIC MEDICINE AND SURGERY

*College of Science, Engineering & Technology*

**Advisor:** Jim Rife

#### Required General Education (7 credits)

CMST	102	Public Speaking (3)
ENG	101	Composition (4)

#### Recommended Support Courses (7 credits)\*

MATH	112	College Algebra (4)
MATH	113	Trigonometry (3)

#### Required for Major (34 credits)

BIOL	105	General Biology I (4)
BIOL	106	General Biology II (4)

## PRE-PROFESSIONAL PROGRAMS

CHEM	201	General Chemistry I (5)
CHEM	202	General Chemistry II (5)
CHEM	320	Organic Chemistry I (5)
CHEM	321	Organic Chemistry II (3)
CHEM	331	Organic Chemistry II Lab (1)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)

### Required Electives (42 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 adequate training in math to take courses in chemistry and physics. Colleges of osteopathic medicine and surgery require a minimum of 90 semester hours for admission. Most students admitted to a college of osteopathic medicine and surgery have completed undergraduate degrees. A few exceptional students are admitted after three years as an undergraduate. Students interested in osteopathic medicine will find that majoring in Human Biology (BS), Physiology (BS) or Biochemistry (BA) will provide them with adequate undergraduate training. The Medical College Admissions Test is required for all applicants to colleges of osteopathic medicine and surgery. Students in this program should regularly consult with the advisor.

### PRE-PHARMACY

*College of Science, Engineering & Technology*

**Advisor:** Danae Quirk Dorr, Ph.D.; Trent Vorlicek, Ph.D.

### Required for Program

BIOL	105	General Biology I (4)
BIOL	220	Human Anatomy (4)
BIOL	270	Microbiology (4)
CHEM	201	General Chemistry I (5)
CHEM	202	General Chemistry II (5)
CHEM	320	Organic Chemistry I (5)
CHEM	321	Organic Chemistry II (3)
CHEM	331	Organic Chemistry II Lab (1)
CMST	102	Public Speaking (3)
ECON	202	Principles of Microeconomics (3)
ENG	101	Composition (4)
ENG	xxx	Literature Course Elective (3)
HIST	xxx	History elective (3)
HUM	xxx	Humanities elective (3)
MATH	121	Calculus I (4)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)
PSYC	101	Psychology (4)

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.

### PRE-PHYSICAL THERAPY

**Advisor:** Mark Schuck

The pre-Physical Therapy curriculum is primarily a science-oriented curriculum which would meet the requirements for admission to most schools of physical therapy. Most physical therapy schools now require a bachelor's degree prior to application for admission, although a few still accept students following two or three years of college preparation.

### Recommended Courses

BIOL	105	General Biology I (4)
BIOL	106	General Biology II (4)
BIOL	220	Human Anatomy (4)
BIOL	230	Human Physiology (4)
CHEM	201	General Chemistry I (5)
CHEM	202	General Chemistry II (5)

CMST	100	Fundamentals of Communication (3)
ENG	101	Composition (4)
HLTH	101	Health and the Environment (3)
HLTH	210	First Aid and CPR (3)
HLTH	321	Medical Terminology (3)
HP	265	Orientation to Occupational and Physical Therapy (1)
IT	100	Introduction to Computing and Applications (4)
MATH	112	College Algebra (4)
MATH	113	Trigonometry (3)
MATH	121	Calculus I (4)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)
PSYC	101	Psychology (4)
PSYC	433	Child Psychology (4) <b>OR</b>
PSYC	436	Adolescent Psychology (4)
PSYC	455	Abnormal Psychology (4)
STAT	154	Elementary Statistics (3)

### PRE-PODIATRIC MEDICINE AND SURGERY

*College of Science, Engineering & Technology*

**Advisor:** Jim Rife

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 Human Biology (BS), Physiology (BS) or Biochemistry (BA) will provide them with adequate 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 (7 credits)

CMST	102	Public Speaking (3)
ENG	101	Composition (4)

### Recommended Support Courses (7 credits)\*

MATH	112	College Algebra (4)
MATH	113	Trigonometry (3)

### Required for Major (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)
CHEM	320	Organic Chemistry I (5)
CHEM	321	Organic Chemistry II (3)
CHEM	331	Organic Chemistry II Lab (1)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)

### Required Electives (42 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 adequate training in math to take courses in chemistry and physics.

### PRE-THEOLOGY

*College of Arts & Humanities*

College courses prior to theological seminary should provide the cultural and intellectual foundations essential to an effective theological education. The emphasis should be on a four-year liberal arts degree program.

The following is regarded by the American Association of Theological Schools as a minimum list of fields with which it is desirable that a student have acquaintance before beginning study in a seminary. Many of these courses will be included in the general education requirements at Minnesota State Mankato.

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## PRE-PROFESSIONAL PROGRAMS

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**English.** Literature, composition, communication studies and related studies.

At least four courses.

**History.** Ancient, modern, European and American. At least two courses.

**Philosophy.** At least two courses.

**Natural Science.** Physics, chemistry, biology. At least one course.

**Social Science.** Psychology, sociology, economics, political science and education. At least four courses including at least one course in psychology.

**Foreign Language.** One or more of the following: Latin, Greek, Hebrew, German, French (cooperative programs available in Greek and Hebrew). At least two years.

**Religion.** At least two courses.

Of the various areas, English, philosophy and history are regarded as the most desirable as areas of concentration.

Because of the general nature of this program, students are encouraged to have close contact with a faculty advisor and the seminary that they are considering attending.

### **PRE-VETERINARY MEDICINE**

*College of Science, Engineering & Technology*

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

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

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

ENG	101	Composition (4)
BIOL	105	General Biology I (4)
BIOL	106	General Biology II (4)
BIOL	211	Genetics (4)
BIOL	270	Microbiology (4)
CHEM	201	General Chemistry I (5)
CHEM	202	General Chemistry II (5)
CHEM	320	Organic Chemistry I (5)
CHEM	360	Principles of Biochemistry (4)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)

Choose one of the following options:

MATH	112	College Algebra (4) <b>AND</b>
MATH	113	Trigonometry (3) <b>OR</b>
MATH	115	Precalculus Mathematics (4) <b>OR</b>
MATH	121	Calculus I (4)

#### **Required Electives (12-16 credits)**

2 History and Social Sciences (6-8 credits)

2 Arts and Humanities (6-8 credits)

**Graduate Record Exam must be taken.**