

## SCIENCE TEACHING PROGRAMS BS

### Science Teaching

Websites: [cset.mnsu.edu/biology/](http://cset.mnsu.edu/biology/)  
[cset.mnsu.edu/chemgeol/](http://cset.mnsu.edu/chemgeol/)  
[cset.mnsu.edu/pa/](http://cset.mnsu.edu/pa/)  
[sbs.mnsu.edu/earthscience](http://sbs.mnsu.edu/earthscience)

#### Coordinators:

Thomas Brown, Physics  
 Phillip Larson, Earth Science  
 Bryce Hoppie, Geology  
 Beth Lavoie, Biological Sciences  
 Jeffrey R. Pribyl, Chemistry

The State of Minnesota grants science teacher licensure for grades 5-8 general science, 9-12 Chemistry, 9-12 Earth Science, 9-12 Life Science, and 9-12 Physics. Students earning a degree in Earth Science Teaching, Life Science Teaching or Physics Teaching from Minnesota State Mankato will qualify for two licenses (1) 5-8 general science and (2) 9-12 specialty. Students earning a degree in Chemistry Teaching will qualify only for the 9-12 Chemistry license.

#### Academic Map/Degree Plan at [www.mnsu.edu/programs/#All](http://www.mnsu.edu/programs/#All)

#### POLICIES/INFORMATION

The Earth Science Teaching, Life Science Teaching, and Physics Teaching majors require the 31 credit general core. All science teaching majors require a science emphasis that ranges from 27-35 credits of science and science teaching methods courses. In addition, the student must complete a 30 credit professional education component and the 3 credit Drug Education course.

The University Science Teaching Program must meet specific competencies to meet professional accreditation and licensure requirements. To stay within the required degree limits of 120 credit hours, students are strongly advised to select courses within the 44 credit general education program that meet both teaching program and general education needs. It is important for the student to meet with his or her advisor to assist with program planning.

A minor is not required for any of the science teaching programs; however, to broaden one's teaching opportunities, double majors are encouraged. For further details, the student should check with one of the science teaching advisors for an overview of available opportunities.

**GPA Policy.** Students obtaining a degree in science teaching must maintain a minimum cumulative GPA of 2.50 in the sciences. Students who are not science teaching majors should consult an advisor concerning possible additional course requirements.

**Life Science Teaching Policies.** Admission to Major is granted by the department. Admission requirements are 32 earned semester hours including BIOL 105, BIOL 106, BIOL 211, and CHEM 201 with a grade of "C" or better; completed General Education Goal Area 4 (Mathematics); completed General Education Goal Area 1, Part A (English Composition); and a minimum cumulative GPA of 2.2, with a cumulative GPA in Biology courses of 2.0. For Life Science Teaching majors, the combined GPA for BIOL 105, BIOL 106, BIOL 211, and CHEM 201 must be 2.4 or better.

A minimum GPA of 2.5 in the sciences and a "C" or better in all science courses is required for graduation with a BS Life Science Teaching degree.

**P/N Grading Policy.** Courses leading to a degree in science teaching may not be taken on a P/N basis except where P/N grading is mandatory.

#### SCIENCE TEACHING PROGRAMS

Required for all Science Teaching Programs unless otherwise noted.

#### REQUIRED GENERAL EDUCATION

HLTH 240 DRUG EDUCATION (3)

#### Required General Science Core (31 credits)

AST	101	Introduction to Astronomy (3)
BIOL	105	General Biology I (4)
BIOL	106	General Biology II (4)
CHEM	201	General Chemistry I (5)
GEOLOG	121	Physical Geology (4)
GEOLOG	310	Earth and Space Systems (3)
PHYS	211	Principles of Physics I (4)*
PHYS	212	Principles of Physics II (4)*

\* PHYS 221, PHYS 222, PHYS 223, PHYS 232 AND PHYS 233 MAY SUBSTITUTE. THE ADDITIONAL CREDIT HOURS WILL REDUCE THE NUMBER OF CREDITS IN THE ADVANCED PHYSICS COURSES.

#### Required for All Science Teaching Program Majors

(Professional Education, 30 credits\*)

See the SECONDARY EDUCATION section for additional information about admissions to Professional Education, and course requirements.

#### \*Professional Education

##### LEVEL 1

KSP 202	may be taken in either LEVEL 1 or LEVEL 2.	
KSP	202	Technology Integration in the Classroom (2)
KSP	220W	Human Relations in a Multicultural Society (3)
KSP	222	Introduction to the Learner and Learning (2)

##### LEVEL 2

KSP 202	may be taken in either LEVEL 1 or LEVEL 2.	
KSP	330	Planning, Instruction, and Evaluation in the Classroom (5)

##### LEVEL 3

KSP	440	Creating Learning Environments to Engage Children, Families, and Community (3)
KSP	442	Reading, Literacy, and Differentiated Instruction in Inclusive Classrooms (3)

##### LEVEL 4

KSP	464	Professional Seminar (1)
KSP	477	5-12 Student Teaching (11)

#### CHEMISTRY 9-12 BS TEACHING

Degree completion = 120 credits

#### Required General Education

BIOL	105	General Biology I (4)
CHEM	201	General Chemistry I (5)
HLTH	240	Drug Education (3)
MATH	121	Calculus I (4)

#### Major Common Core

CHEM	202	General Chemistry II (5)
CHEM	305	Analytical Chemistry (4)
CHEM	316	Descriptive Main Group Chemistry (3)
CHEM	322	Organic Chemistry I (4)
CHEM	324	Organic Chemistry II (3)
CHEM	325	Organic Chemistry II Lab (1)
CHEM	340	Quant for Chem and Biochem I (1)
CHEM	341	Quant for Chem and Biochem II (1)
CHEM	360	Principles of Biochemistry (4)
CHEM	381W	Introduction to Research (2)
CHEM	440	Physical Chemistry I (3)
CHEM	450	Physical Chemistry Laboratory I (1)
CHEM	479	Teaching Physical Science (4)
CHEM	495	Senior Seminar (1)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)

Required Minor: None.

#### Other Graduation Requirements

See the SECONDARY EDUCATION section for admission requirements to Professional Education and a list of required professional education courses.

## SCIENCE TEACHING CONTINUED

### EARTH SCIENCE 5-12 BS TEACHING

Degree completion = 120 credits

**Required General Education** (3 credits)

**Required General Science Core** (31 credits)

**Required Professional Education** (30 credits)

#### **Required for Major**

AST	125L	Observational Astronomy (3)
GEOG	217	Weather (4)
GEOG	315	Geomorphology (3)
GEOG	410	Climatic Environments (3)
GEOL	122	Earth History (4)
GEOL	201	Elements of Mineralogy (4)
CHEM	479	Teaching Physical Science (4)

#### **Required for Major** (Research, 1-3 credits)

GEOG	440	Field Studies (1-4)
GEOG	480	Seminar (1-4)
GEOG	499	Individual Study (1-3)
GEOL	499	Individual Study (1-5)

#### **Required for Major** (Electives, 9 credits)

(Must choose from at least two departments)

AST	102	Introduction to the Planets (3)
AST	104	Introduction to Experimental Astronomy (2)
GEOG	373	Introduction to Geographic Information Systems (4)
GEOG	420	Conservation of Natural Resources (3)
GEOL	330	Structural Geology (4)
GEOL	350	Environmental Geology (4)
GEOL	450	Hydrogeology (3)

**Required Minor:** None.

#### **Other Graduation Requirements**

See the SECONDARY EDUCATION section for admission requirements to Professional Education and a list of required professional education courses.

### LIFE SCIENCE 5-12 BS TEACHING

Degree completion = 120 credits

**Required Professional Education** (30 credits)

#### **Required General Education**

AST	101	Introduction to Astronomy (3)
BIOL	105	General Biology I (4)
CHEM	201	General Chemistry I (5)
GEOL	121	Physical Geology (4)
HLTH	240	Drug Education (3)
KSP	220W	Human Relations in a Multicultural Society (3)
PHYS	211	Principles of Physics I (4)

#### **Math Requirement** (choose 3-4 credits)

MATH	113	Trigonometry (3)
MATH	115	Precalculus Mathematics (4)

#### **Major Common Core**

BIOL	106	General Biology II (4)
BIOL	211	Genetics (4)
BIOL	215	General Ecology (4)
BIOL	220	Human Anatomy (4)
BIOL	270	Microbiology (4)
BIOL	301	Evolution (2)
BIOL	485	Biology Teaching Methods and Materials (4)
GEOL	310	Earth and Space Systems (3)
PHYS	212	Principles of Physics II (4)

#### **Independent Study** (choose 1 credits)

At least one credit is required. Additional credits will be counted as electives.

BIOL	499	Individual Study (1-4)
------	-----	------------------------

#### **Major Restricted Electives** (choose 4 credits)

BIOL	408	Vertebrate Ecology (4)
BIOL	409	Advanced Field Ecology (4)

#### **Major Unrestricted Electives**

Choose at least 9 additional credits of 300-400 level Biology courses.

#### **Other Graduation Requirements**

See the SECONDARY EDUCATION section for admission requirements to Professional Education and a list of required professional education courses.

### PHYSICS 5-12 BS TEACHING

Degree completion = 120 credits

#### **Required General Education**

AST	101	Introduction to Astronomy (3)
BIOL	105	General Biology I (4)
CHEM	201	General Chemistry I (5)
GEOL	121	Physical Geology (4)
HLTH	240	Drug Education (3)
KSP	220W	Human Relations in a Multicultural Society (3)
MATH	121	Calculus I (4)

#### **Major Common Core**

PHYS 221, PHYS 222, PHYS 223, PHYS 232 and PHYS 233 may substitute for PHYS 211 and PHYS 212. The additional credit hours will reduce the number of credits on the advanced physics courses.

BIOL	106	General Biology II (4)
GEOL	310	Earth and Space Systems (3)
PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)
PHYS	335	Modern Physics I (3)
PHYS	336	Modern Physics II (3)
PHYS	465	Computer Applications in Physics (3)
PHYS	482	Teaching Methods and Materials in Physical Science (4)

(choose 2 credits)

2 credits are required for the core.

PHYS	381	Tutoring Physics (1-3)
------	-----	------------------------

(choose 2 credits)

2 credits are required for the core.

PHYS	493	Undergraduate Research (1-6)
------	-----	------------------------------

#### **Physics Electives** (choose 8 credits)

This is reduced to 4 credits if PHYS 221, PHYS 222, PHYS 223, PHYS 232 and PHYS 233 have been taken in place of PHYS 211 and PHYS 212 in partial fulfillment of the General Science Core requirements. If PHYS 211 and PHYS 212 are completed successfully, PHYS 221, PHYS 222, PHYS 223, PHYS 232 and PHYS 233 may be used to fulfill the Physics Elective credits.

PHYS 300-499

#### **Other Graduation Requirements**

See the SECONDARY EDUCATION section for admission requirements to Professional Education and a list of required professional education courses.