SCIENCE TEACHING

Science Teaching

Website: cset.mnsu.edu/biology/
cset.mnsu.edu/chemistrygeol/
cset.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, 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

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.

REQUIRED GENERAL EDUCATION

HILTH 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]
GEOL 121  Physical Geology [4]
GEOL 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 220VV  Human Relations in a Multicultural Society [3]
KSP 222  Introduction to the Learner and Learning [2]
Floating course (can be taken with LEVEL 1 or LEVEL 2)
KSP 202  Technology Integration in the Classroom [1]

LEVEL 2

KSP 330  Planning and Instruction in the Classroom [3]
KSP 334  Assessment and Evaluation [3]

LEVEL 3

KSP 440  Creating Learning Environments to Engage Children, Families, and Community [3]
KSP 442  Reading, Literacy, and Differentiated Instruction in the 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]
HILTH 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.

**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)

**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 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)

**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 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)

**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)

**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.