SCIENCE TEACHING

Science Teaching

Websites:  cset.mnsu.edu/biology/
cset.mnsu.edu/chemgeol/
cset.mnsu.edu/physics/
cset.mnsu.edu/geography/

Coordinates:
Thomas Brown, Ph.D., Physics
Donald Friend, Ph.D., Geography
Bryce Hoppie, Ph.D., Geology
Beth Lavoie, Ph.D., Biological Sciences
Jeffrey R. Pribyl, Ph.D., 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 from Minnesota State Mankato will qualify for two licenses (1) 5-8 general science and (2) 9-12 specialty.

Each major requires the 31 credit general core and 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 three 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 their 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.

POLICIES/INFORMATION

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.

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 (3 credits)
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)
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 Majors . (Professional Education, 30 credits)
See the SECONDARY EDUCATION section for additional information about admissions to Professional Education, and course requirements.

Required Minor: None.

CHEMISTRY 5-12 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)

Other Graduation Requirements

Professional Education

LEVEL 1
KSP 202 may be taken in either LEVEL 1 or LEVEL 2. KSP 464 must be taken in all levels but credit will be awarded in LEVEL 4 only.
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)
KSP 464 Professional Seminar (1)

LEVEL 2
KSP 202 may be taken in either LEVEL 1 or LEVEL 2. KSP 464 must be taken in all levels but credit will be awarded in LEVEL 4 only.
KSP 330 Planning, Instruction, and Evaluation in the Classroom (5)
KSP 464 Professional Seminar (1)

LEVEL 3
KSP 464 must be taken in all levels but credit will be awarded in LEVEL 4 only.
KSP 440 Creating Learning Environments to Engage Children, Families, and Community (3)
KSP 442 Reading, Literacy, and Differentiated Instruction in Inclusive Classrooms (3)
KSP 464 Professional Seminar (1)

LEVEL 4
Course credit for KSP 464 is awarded in LEVEL 4, but must be taken in all levels.
KSP 464 Professional Seminar (1)
KSP 477 5-12 Student Teaching (11)

Required Minor: None.

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 (Core, 24 credits)
AST 125 Observational Astronomy (3)
GEOG 217 Weather (4)
GEOG 315 Geomorphology (3)
At least one credit is required. Additional credits will be counted as elective.

**Independent Study**
- KSP 202 may be taken in LEVEL 1 or LEVEL 2. KSP 464 must be taken in all levels, but credit will be awarded in LEVEL 4 only.

**KSP 202W**
- Human Relations in a Multicultural Society (3)

**Required for Major** (Research, 1-3 credits)
- GEOL 440 Field Studies: Colorado (3)
- GEOL 440 Field Studies: Field Methods (3)
- GEOL 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 104 Introduction to Experimental Astronomy (2)
  - GEOL 420 Conservation of Natural Resources (3)
  - GEOL 330 Structural Geology (4)
  - GEOL 350 Environmental Geology (4)
  - GEOL 450 Hydrogeology (3)

**Required Minor: None.**

**LIFE SCIENCE 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)
- 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 credit)
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**
**Professional Education**
- **LEVEL 1**
  - KSP 202 may be taken in LEVEL 1 or LEVEL 2. KSP 464 must be taken in all levels, but credit will be awarded in LEVEL 4 only.
  - KSP 202 Technology Integration in the Classroom (2)

**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)

**Physics Electives** (choose 2 credits)
- 2 credits are required for the core.
- PHYS 381 Tutoring Physics (1-3)

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