

Science Teaching

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

Coordinators:

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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 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 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 General Education (3 credits)

HLTH 310 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 (120 credits)

Required General Education

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

Major Common Core

AST 101 Introduction to Astronomy (3)
 BIOL 106 General Biology II (4)
 CHEM 202 General Chemistry II (5)
 CHEM 305 Analytical Chemistry (4)
 CHEM 312 Intermediate Inorganic Chemistry (2)
 CHEM 320 Organic Chemistry I (5)
 CHEM 360 Principles of Biochemistry (4)
 CHEM 381 Introduction to Research (2)
 CHEM 440 Physical Chemistry I (3)
 CHEM 450 Physical Chemistry Laboratory (1)
 CHEM 479 Teaching Physical Science (4)
 CHEM 495 Senior Seminar (1)
 GEOL 310 Earth and Space Systems (3)
 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 220W Human Relations in a Multicultural Society (3)
 KSP 222 Introduction to the Learner and Learning (2)
 KSP 202 Technology Integration in the Classroom (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

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 (3)
 GEOG 315 Geomorphology (3)
 GEOG 410 Climatic Environments (3)
 GEOL 122 Earth History (4)

SCIENCE TEACHING

GEOL 201	Elements of Mineralogy (4)
GEOG 464	Teaching Earth Science (4) OR
GEOL 479	Teaching Earth Sciences (4)

Required for Major (Research, 1-3 credits)

GEOG 440	Field Studies: Colorado (3)
GEOG 440	Field Studies: Field Methods (3)
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.

LIFE SCIENCE 5-12 BS TEACHING (128 credits)

Required General Education (3 credits)

Recommended General Education (22-23 credits)

Required General Science Core (31 credits)

Required Professional Education (30 credits)

Required for Major (Core, 27 credits)

BIOL 211	Genetics (4)
BIOL 215	General Ecology (4)
BIOL 220	Human Anatomy (4)
BIOL 270	Microbiology (4)
BIOL 301	Evolution (2)
BIOL 408	Vertebrate Ecology (4) OR
BIOL 409	Advanced Field Ecology (4)
BIOL 485	Biology Teaching Methods and Materials (4)
BIOL 499	Individual Study: Research Project (1)

Required for Major (Electives, 9 credits)

(Choose minimum of 9 credits from Biology courses from the 300-400 level)

PHYSICS (5-12) BS TEACHING

Required General Education (3 credits)

Recommended General Education (22-23 credits) Including MATH 121

Required General Science Core (31-33 credits)

Required Professional Education (30 credits)

Required for Major (Core, 21 credits)

MATH 122	Calculus II (4)
PHYS 335	Modern Physics I (3)
PHYS 336	Modern Physics II (3)
PHYS 381	Tutoring Physics (2)
PHYS 465	Computer Applications in Physics (3)
PHYS 482	Teaching Methods and Materials in Physical Science (4)
PHYS 493	Undergraduate Research (1-6) (2 credits required)

Electives (Minimum of 8 Credits)*

Students may use PHYS 221, PHYS 222, PHYS 223, PHYS 232 and PHYS 233 to fulfill their Physics Electives requirement **only if** PHYS 211 and PHYS 212 are completed successfully.

Alternatively, students with a strong interest in applying advanced mathematical skills to problems in physics are encouraged to choose a minimum of 8 credits* of higher level Physics or Mathematics as approved by the student's advisor to fulfill the Physics Elective requirement.

*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.