

SCIENCE TEACHING

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.

POLICIES/INFORMATION

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.

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

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 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)

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

AST 125 Observational Astronomy (3)
GEOG 217 Weather (4)
GEOG 315 Geomorphology (3)
GEOG 410 Climatic Environments (3)
GEOL 122 Earth History (4)

SCIENCE TEACHING CONTINUED

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

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 credits)

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

BIOL 499	Individual Study (1-4)
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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)
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 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 it must be taken in all levels.

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

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)
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(choose 2 credits)

2 credits are required for the core.

PHYS 493	Undergraduate Research (1-6)
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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.