SCIENCE TEACHING PROGRAMS BS

Science Teaching

Websites:  cset.mnsu.edu/biology/  
cset.mnsu.edu/chemgeol/  
cset.mnsu.edu/pa/  
sbs.mnsu.edu/earthscience

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.

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLTH 240</td>
<td>DRUG EDUCATION (3)</td>
</tr>
</tbody>
</table>

Required General Science Core (31 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST 101</td>
<td>Introduction to Astronomy (3)</td>
</tr>
<tr>
<td>BIOL 105</td>
<td>General Biology I (4)</td>
</tr>
<tr>
<td>BIOL 106</td>
<td>General Biology II (4)</td>
</tr>
<tr>
<td>CHEM 201</td>
<td>General Chemistry I (5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 202</td>
<td>Principles of Chemistry I (4)*</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Principles of Physics II (4)*</td>
</tr>
<tr>
<td>* 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.</td>
<td></td>
</tr>
</tbody>
</table>

Required for all Science Teaching Program Majors

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 322</td>
<td>Organic Chemistry I (4)</td>
</tr>
<tr>
<td>CHEM 324</td>
<td>Organic Chemistry II (3)</td>
</tr>
<tr>
<td>CHEM 325</td>
<td>Organic Chemistry II Lab (1)</td>
</tr>
<tr>
<td>CHEM 340</td>
<td>Quant for Chem and Biochem I (1)</td>
</tr>
<tr>
<td>CHEM 341</td>
<td>Quant for Chem and Biochem II (1)</td>
</tr>
<tr>
<td>CHEM 360</td>
<td>Principles of Biochemistry (4)</td>
</tr>
<tr>
<td>CHEM 381W</td>
<td>Introduction to Research (2)</td>
</tr>
<tr>
<td>CHEM 440</td>
<td>Physical Chemistry I (3)</td>
</tr>
<tr>
<td>CHEM 450</td>
<td>Physical Chemistry Laboratory I (1)</td>
</tr>
<tr>
<td>CHEM 479</td>
<td>Teaching Physical Science (4)</td>
</tr>
<tr>
<td>CHEM 495</td>
<td>Senior Seminar (1)</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Principles of Physics I (4)</td>
</tr>
<tr>
<td>PHYS 212</td>
<td>Principles of Physics II (4)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 105</td>
<td>General Biology I (4)</td>
</tr>
<tr>
<td>CHEM 305</td>
<td>Principles of Organic Chemistry (3)</td>
</tr>
<tr>
<td>MATH 121</td>
<td>Calculus I (4)</td>
</tr>
</tbody>
</table>

Major Common Core

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

Required Minor: None.
### Science Teaching Continued

**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)
- **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)
- **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)
- **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**
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)
- **GEOG 121** Physical Geology (4)
- **HETH 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.

**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)
- **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.

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