

# Comprehensive Secondary Science - Teaching B.A.

## Comprehensive Secondary Science - Teaching major

The B.A. Comprehensive Secondary Science Teaching major requires a minimum of 120 total hours to graduate. This total includes UNIFI/General Education requirements, the Professional Experiences requirements, Educator Essentials requirements, and the following specified major requirements, to complete the minimum of 120 hours.

This major is intended for students who wish to teach at the secondary level in all areas of science (biology, chemistry and biochemistry, earth science, and physics). The program will lead to Iowa Department of Education endorsement in Basic Science (5-12), All Science (5-12), and 3 out of the 4 endorsements Biology (5-12), Chemistry (5-12), Earth Science (5-12), and Physics (5-12).

### Required Core

Biology:			
BIOL 2051	General Biology: Organismal Diversity		4
BIOL 2052	General Biology: Cell Structure and Function		4
BIOL 3100	Evolution, Ecology and the Nature of Science		3
Chemistry and Biochemistry:			
CHEM 1110	General Chemistry I *		4
CHEM 1120	General Chemistry II *		4
CHEM 2040	Applied Organic and Biochemistry		3-4
or CHEM 2210	Organic Chemistry I		
Earth Science:			
EARTHSCI 1100	Astronomy		3
EARTHSCI 1200	Elements of Weather		3
EARTHSCI 1300	Introduction to Geology		4
Physics:			
PHYSICS 1511	General Physics I **		4
PHYSICS 1512	General Physics II **		4
PHYSICS 4080/5080	Resources for Teaching Physics		2

### Additional Science Content: 12-15

Choose 3 of the 4 required science content areas below, which enables you to complete the requirements for the individual science subject endorsements you choose. If you choose to complete the requirements for all 4 science content areas, work with your advisor. The course or courses you don't complete can be replaced with science content courses in science areas that you choose to add.

Biology (4 hours):			
BIOL 3140	Genetics		
Chemistry and Biochemistry (3 hours):			

any 2000-level or above course

Earth Science (6 hours):	
EARTHSCI 1110	Astronomy Laboratory
EARTHSCI 1210	Elements of Weather Laboratory
EARTHSCI 1320	Earth History
Physics (5 hours):	
any 2000-level or above course	

**Total Hours 54-58**

\* Students with excellent preparation in chemistry may substitute CHEM 1130 plus 3 hours of additional credit hours in chemistry electives for CHEM 1110 and CHEM 1120.

\*\*Students with excellent preparation in physics and calculus may substitute PHYSICS 1701 and PHYSICS 1702 for PHYSICS 1511 and PHYSICS 1512.

## Professional Experiences

Required:

EDUC 2385	Teaching Methods I: Secondary Science * **	3
EDUC 2485	Teaching Internship I: Secondary Science	3
EDUC 3585/5585	Teaching Methods II: Secondary Science *	3
EDUC 3685/5685	Teaching Internship II: Secondary Science	3
EDUC 4138	Secondary School Teaching	12

**Total Hours 24**

\* A grade of C (2.00) or higher is required for all Methods courses.

\*\*Comprehensive Secondary Science Teaching majors can count EDUC 2385 Teaching Methods I: Secondary Science for category 5 of Educator Essentials.

For completion of this major the grade point average in each of the four science disciplines must be a minimum of 2.00, with a 2.50 GPA in the major as a whole.

Elective courses must be ones that count toward the major in the discipline or be approved for this use by the department offering the course.

### Notes:

1. Students with sufficient high school preparation may be allowed to omit some introductory courses and substitute other courses from the same department.

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2. The mathematics prerequisite for one or more of the above courses is a working knowledge of algebra and trigonometry or MATH 1140.

### Educator Essentials

Required: \*

Select one of the following in each category:

#### Category 1: The Learner 3

EDPSYCH 1500	Reflections on Learning
EDPSYCH 2068	Development and Learning in Sociocultural Contexts
EDPSYCH 2100	Creativity and Higher Order Thinking in the Classroom
SOCFOUND 2243	Rethinking the Learning Society: Education and Its Future(s)

#### Category 2: Social Contexts of Learning 3

SOCFOUND 2119	Social & Cultural Foundations of Education
SOCFOUND 2134	A Modern History of Education in the United States
SOCFOUND 2334	Education Policy and Politics of Education
TESOL 2015	Language Today

#### Category 3: Education for All 3

KINES 4152	Adapted Physical Education
SOCFOUND 3334	Education, Power, and Change
SOCFOUND 3434	Social Movements and Education
SPIE 3140	Interdisciplinary and Intersectional Study of Education for All
SPIE 3150	Meeting the Needs of Diverse Learners in Classrooms
TESOL 3710	Content Area Strategies for English Language Learners

#### Category 4: The Classroom Environment 3

EDPSYCH 3200	Deeper Motivation and the Highly Engaged Classroom
EDPSYCH 3300	Level Up: Gamified Learning Environments
ECIE 4151	Early Childhood Curriculum Development and Organization
RTNL 3360	Playful Learning and Project-Based Experiences: Techniques for Ed and Recreational Environments
SOCFOUND 3219	Critical Perspectives on Technology and Education

#### Category 5: Effective Pedagogy 3

ARTED 4600	Expressive Learning Assessment
LRNTECH 3600	Technology, Pedagogy, and Learning in the Digital Age
MEASRES 3510	Assessment for Learning

TEACHING 3500	Effective Teaching through Differentiation, Technology and Assessment
<b>Category 6: The Professional Educator <span style="float: right;">3</span></b>	
ECIE 3149	Child, Family, School and Community Relationships
SOCFOUND 3519	Teacher Leadership & Educational Change
TEACHING 3177	Collaborative Partnerships for Educators

**Total Hours 18**

\* A grade of C (2.00) or higher is required in each Educator Essentials course.

## Four-Year Plan

### Comprehensive Secondary Science Teaching, B.A.

This is a sample plan of study with a suggested sequencing of classes for the major. University electives may be applied to earn additional academic majors, minors, or certificates. Students should regularly meet with their academic advisor to plan their specific semester schedule to include UNIFI/General Education program and/or university elective hours required.

Course	Title	Hour
<b>Freshman</b>		
<b>Fall</b>		
BIOL 2051	General Biology: Organismal Diversity	4
CHEM 1110	General Chemistry I	4
UNIFI/General Education or University Electives		6
<b>Hours</b>		<b>14</b>
<b>Spring</b>		
BIOL 2052	General Biology: Cell Structure and Function	4
CHEM 1120	General Chemistry II	4
UNIFI/General Education or University Electives		3
Educator Essentials Course		3
<b>Hours</b>		<b>14</b>
<b>Sophomore</b>		
<b>Fall</b>		
PHYSICS 1511	General Physics I	4
BIOL 3100	Evolution, Ecology and the Nature of Science	3
EARTHSCI 1200	Elements of Weather	3
EARTHSCI 1210	Elements of Weather Laboratory (or additional science content course)	1
Educator Essentials Course		3
UNIFI/General Education or University Electives		2
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
PHYSICS 1512	General Physics II	4
EDUC 2385	Teaching Methods I: Secondary Science	3
EDUC 2485	Teaching Internship I: Secondary Science	3
EARTHSCI 1100	Astronomy	3

EARTHSCI 1110	Astronomy Laboratory (or additional science content course)	1
Educator Essentials Course		3
<b>Hours</b>		<b>17</b>
<b>Junior</b>		
<b>Fall</b>		
CHEM 2040	Applied Organic and Biochemistry	4
EARTHSCI 1300	Introduction to Geology	4
Educator Essentials Course		3
UNIFI/General Education or University Electives		3
Physics Elective 3000-Level or Above (or additional science content course)		3
<b>Hours</b>		<b>17</b>
<b>Spring</b>		
PHYSICS 4080/5080	Resources for Teaching Physics	2
EARTHSCI 1320	Earth History (or additional science content course)	4
BIOL 3140	Genetics (or additional science content course)	4
Physics Elective 3000-Level or Above (or additional science content course)		2
UNIFI/General Education or University Electives		3
<b>Hours</b>		<b>15</b>
<b>Senior</b>		
<b>Fall</b>		
EDUC 3585/5585	Teaching Methods II: Secondary Science	3
EDUC 3685/5685	Teaching Internship II: Secondary Science	3
Chemistry Elective 2000-Level or Above (or additional science content course)		3
Educator Essentials Course		3
UNIFI/General Education or University Electives		3
<b>Hours</b>		<b>15</b>
<b>Spring</b>		
EDUC 4138	Secondary School Teaching	12
<b>Hours</b>		<b>12</b>
<b>Total Hours</b>		<b>120</b>

- **Goal 3:** Demonstrate Professional Growth as a Science Teacher
  - **Outcome 3.1.** Engage in relevant activities and reflective practices that lead to professional growth and life-long learning.

## Related Programs

- Science Education M.A.
- Social Emotional Learning Minor

## Learning Outcomes

### Comprehensive Secondary Science Teaching, B.A.

- **Goal 1:** Demonstrate Knowledge of Science and Scientific Practices
  - **Outcome 1.1.** Students will demonstrate an understanding of science content and scientific practices to advance student learning in a secondary science classroom.
- **Goal 2:** Demonstrate Knowledge and Pedagogical Practices for Teaching Science
  - **Outcome 2.1.** Students will design instruction that have clear and challenging objectives with assessments in alignment with those objectives that actively engages students in science and science practices as recommended by national and state standards.
  - **Outcome 2.2.** Students will implement effective teaching practices based on research and national and state standards including the use of technology to address the needs and advance learning of all students in a science classroom.