

# BROAD FIELD SCIENCE MAJOR (M)

The Broad Field Science Education major consists of a combination of the Natural Sciences major from the School of Arts and Sciences along with a Secondary Education major. Completers of this program will be licensed to teach all areas of science in grades 4 to 12. Students can select from three different emphases - Biology, Chemistry, or Physics.

## Program Learning Outcomes

- 1. Learner Development:** The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences (Human Relations, Pedagogical Knowledge)
- 2. Learning Differences :** The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards. (Human Relations, Pedagogical Knowledge)
- 3. Learning Environments:** The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation. (Teaching Practice, Human Relations)
- 4. Content Knowledge:** The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content. (Content Knowledge)
- 5. Application of Content:** The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
- 6. Assessment Strategies:** The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making. (Content Knowledge, Pedagogical Knowledge)
- 7. Planning for Instruction:** The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context. (Content Knowledge, Pedagogical Knowledge)
- 8. Instructional Strategies:** The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways. (Pedagogical Knowledge, Communication Skills, Teaching Practice)
- 9. Professional Learning and Ethical Practice:** The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

10. **Leadership and Collaboration:** The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

11. **Character/Faith Development:** All teachers model a value system which emphasizes moral and ethical character. Teachers in Christian schools integrate faith and learning while modeling Christian mission and service with a biblical worldview. Lutheran teachers adhere to the doctrine and practice of the Lutheran Church-Missouri Synod. (Human Relations, Professional Dispositions, Content Knowledge)

NOTE: All licensable majors and minors require that students pass applicable content examinations for licensure in the state of Wisconsin.

Code	Title	Hours
Core Requirements ( <a href="https://catalog.cuw.edu/undergraduate/university/acad-prog/trad/core/">https://catalog.cuw.edu/undergraduate/university/acad-prog/trad/core/</a> )		45
		-
		48
<b>Secondary Curriculum</b>		31
		-
		37
<b>Major Subject Area</b>		53
<b>Total Hours</b>		<b>129-138</b>

NOTE: Check with the Chair of the Secondary Education Department for possible changes in this major.

## Core Curriculum - 45-48 Credits

Concordia Common Core

Code	Title	Hours
Theology - Public Education		
REL 100	The Bible	3
REL 110	Christian Faith	3
Theology - Lutheran (LTD) & Christian (CTC)		
REL 201	Old Testament	3
REL 203	New Testament	3
REL 204	Biblical Theology	3
Code	Title	Hours
CCE 130	Christian Citizen	3
CCE 140	Science & Humanity	3
CCE 110	Western Culture & Worldview	3
CCE 120	Western Thought & Worldview	3
Liberal Arts Dimensions		
ENG 104	Introduction to Writing	3
COMM 105	Public Speaking (or a Language course)	3
	or COMM 201 Interpersonal Communication	
Faith and Life Elective: Any course with REL prefix other than REL 100, 110, 201, 203, 204		3
ED 1102	Foundations of Education	3
HHP 100	Stewardship of the Body	1
HHP Activity Course		1
Human Creativity and Expression: Art, Music, Theater, Literature or Graphic Design activity course		3

MATH 205	Statistics I ((Stats 1 for Biology Emphasis or College Algebra for Chemistry/Physics emphasis))	3
or MATH 128	College Algebra	
BIO 141	General Biology I	4
ED 1103	Human Relations for Teachers (register with ED 1212)	3

Note: Two CUW - approved writing intensive courses are required for graduation. Other Electives if under 120 credits: 3-6

## SECONDARY CURRICULUM - 31 - 37 credits

Code	Title	Hours
<i>Field Experience (clinical experiences are graded as pass/fail)</i>		
ED 1211	Discovery Clinical	0
ED 1212	Cultural Clinical	0
ED 1213	Special Education Clinical	0
Education Seminars (seminars are graded as pass/fail)		
ED 1000	Orientation Seminar	0
ED 2000	UDS Seminar	0
ED 3000	Student Teaching Seminar	0
Theoretical & Practical Components		
ED 1230	Nature of the Exceptional Child (register with ED 1213)	3
ED 1275	Human Learning (register with ED 1211)	3
ED 3318	The Art & Science of Planning <sup>2</sup>	3
ED 4337	The Art and Science of Assessment <sup>2,3</sup>	3
ED 4339	The Art and Science of Instruction <sup>2,3</sup>	3
ED 4411	The Profession and Ethics of Teaching <sup>2</sup>	3
Student Teaching Component (Take these courses in the same semester)		
ED 4414	Portfolio Completion-Secondary <sup>2</sup>	1
ED 4433 & ED 4434	Secondary Ed Student Teaching 1 and Secondary Ed Student Teaching 2 <sup>2</sup>	12
<b>Lutheran (LCMS Members) Teacher Diploma Requirements</b>		
ED 2306	Teaching the Faith	3
REL 404	Lutheran Confessions	3
<b>Christian Teacher Certification Requirements</b>		
ED 2306	Teaching the Faith	3
Select one of the following: 3		
REL 404	Lutheran Confessions	
REL 347	Law and Gospel in the Life of the Church	
REL 333	A Survey of Christian Thought	
PHIL 325	Christian Apologetics	
PHIL 334	Christ and Culture	

<sup>1</sup> ED4337, ED4339, and ED4376 are taken concurrently during the Fall prior to student teaching.

<sup>2</sup> Course requires Upper Division Status.

Code	Title	Hours
<b>Required Core Courses</b>		
BIO 141	General Biology I (Science with a Lab)	

MATH 205	Statistics I (MATH 205 for Biology Emphasis; MATH 128 for Chemistry/Physics Emphases)	
or MATH 128	College Algebra	
COMM 105	Public Speaking (Communication)	
or COMM 20	Interpersonal Communication	
ENG 104	Introduction to Writing	

### Courses Required for Secondary Education Students

ED 1102	Foundations of Education (Core Human Beings & Being Human requirement)	
ED 1103	Human Relations for Teachers (Core Society and Culture requirement)	
ED 4305	Curriculum & Methods in Science & Environment	

### Major Requirements

BIO 141	General Biology I (taken in core)	
BIO 142	General Biology II	4
CHEM 141	General Chemistry I	4
CHEM 142	General Chemistry II	4
PHYS 151	General Physics I	4
or PHYS 171	University Physics I	
PHYS 152	General Physics II	4
or PHYS 172	University Physics II	
SCI 275	Cosmogony	3

Choose one environmentally-focused class (<https://catalog.cuw.edu/undergraduate/cuwcampus/education/majors/secondary-education-grades-6-12-licensable-subject-area-majors-minors/broad-field-science-education-major/.#env>) 3-4

### Choose one of the following emphases:

9-17

Emphasis in Biology (<https://catalog.cuw.edu/undergraduate/cuwcampus/education/majors/secondary-education-grades-6-12-licensable-subject-area-majors-minors/broad-field-science-education-major/.#bio>)

Emphasis in Chemistry (<https://catalog.cuw.edu/undergraduate/cuwcampus/education/majors/secondary-education-grades-6-12-licensable-subject-area-majors-minors/broad-field-science-education-major/.#chem>)

Emphasis in Physics (<https://catalog.cuw.edu/undergraduate/cuwcampus/education/majors/secondary-education-grades-6-12-licensable-subject-area-majors-minors/broad-field-science-education-major/.#phys>)

Major Electives (<https://catalog.cuw.edu/undergraduate/cuwcampus/education/majors/secondary-education-grades-6-12-licensable-subject-area-majors-minors/broad-field-science-education-major/.#elect>) 7-15

**Total Hours** 51

<sup>1</sup> Requires Upper Division Status

## Environmentally-Focused Courses

Code	Title	Hours
BIO 156	Environmental Science	3-4
or PHYS 108	Introductory Astronomy	
or SCI 195	Meteorology	
or SCI 235	Earth Science	
or SCI 246	Oceanography	

## Emphasis in Biology

Code	Title	Hours
MATH 205	Statistics I (taken in core)	
BIO 146	Essentials of Anatomy and Physiology (If BIO 191 is chosen, BIO 192 must be selected as a major elective)	4
or BIO 191	Human Anatomy and Physiology I	
BIO 244	Botany	4
BIO 260	Biology of Microorganisms	4
BIO 348	Genetics	4
BIO 490	Biology Senior Seminar (fall semester)	1
<b>Total Hours</b>		<b>17</b>

Other courses approved by the chair of the Department of Life and Earth Sciences

## Emphasis in Chemistry

Code	Title	Hours
MATH 128	College Algebra (taken in core)	
CHEM 241	Organic Chemistry I	4
CHEM 242	Organic Chemistry II	4
CHEM 225	Analytical Chemistry	4
CHEM 425	Biochemistry	4
CHEM 491	Chemistry Senior Seminar I	1
<b>Total Hours</b>		<b>17</b>

## Emphasis in Physics

Code	Title	Hours
MATH 128	College Algebra (taken in core)	
PHYS 108	Introductory Astronomy (must be selected as environmentally-focused course)	
PHYS 171	University Physics I (must be selected as major requirement)	
PHYS 172	University Physics II (must be selected as major requirement)	
MATH 201	Calculus I (must be taken before PHYS 171)	4
MATH 202	Calculus II	4
CHEM 491	Chemistry Senior Seminar I	1
<b>Total Hours</b>		<b>9</b>

## Major Electives

7 elective credits are required for the biology/chemistry emphases, 15 for the physics emphasis. Major electives can be selected from any courses in the other emphases (Biology (p. 3), Chemistry (p. 3), Physics (p. 3)), additional courses from the environmentally-focused (p. 2) category, or selected from the following (prerequisites may apply):

Code	Title	Hours
CHEM 235	Descriptive Inorganic Chemistry	4
BIO 192	Human Anatomy and Physiology II	4
BIO 240	Zoology	4
BIO 321	Cell Biology	4
BIO 367	Ecology of the Tropics	3
BIO 368	Ecology of the Tropics-Lab	1
BIO 410	Ecology	4