

BIOLOGY COMPREHENSIVE MAJOR: SECONDARY LICENSURE EMPHASIS

Program Requirements

The Secondary Licensure Emphasis requires a minimum of 59 credits including the 26-credit Biology Nucleus, eight additional credits in Biology and/or ESS, and 25 credits in supporting courses.

Students must fulfill the requirements for the Secondary Licensure Option (<https://catalog.western.edu/undergraduate/programs/education/elementary-education-comprehensive-secondary-k-12-licensure/>) (described under Education). Students interested in pursuing this comprehensive program should consult with the Teacher Education Program advisor in addition to the advisor in their major as soon as possible.

All Biology majors require the 26-credit Biology Nucleus.

Code	Title	Credits
Biology Nucleus		
BIOL 150	Biological Principles (with laboratory) (GT-SC1)	4
BIOL 151	Diversity and Patterns of Life (with laboratory)	4
BIOL 301	General Ecology	3
BIOL 310	Cell Biology	3
BIOL 312	Genetics (with recitation)	4
CHEM 111	General Chemistry I (GT-SC2)	3
CHEM 112	General Chemistry Laboratory I (GT-SC1)	1
CHEM 113	General Chemistry II	3
CHEM 114	General Chemistry Laboratory II	1
Total Credits		26

Code	Title	Credits
Required Biology and/or ESS courses		
BIOL 201 or BIOL 342	Introduction to Microbiology (with laboratory) Microbiology (with laboratory)	4
Select one of the following:		4-8
ESS 201	Essentials of Human Anatomy and Physiology (with Lab)	4
BIOL 372 & BIOL 373	Human Anatomy and Physiology I (with laboratory) and Human Anatomy and Physiology II (with laboratory)	
Total Credits		8-12

Code	Title	Credits
Minimum supporting courses		
CHEM 231	Introduction to Organic Chemistry and Biochemistry	3
CHEM 234	Introductory Organic and Biochemistry Laboratory	1
GEOL 101	Physical Geology (GT-SC2)	3
GEOL 105	Physical Geology Laboratory (GT-SC1)	1
GEOL 201	Historical Geology (with laboratory)	4
MATH 213	Probability and Statistics (GT-MA1)	3

PHYS 110	Introductory Astronomy (GT-SC2)	3
PHYS 120	Meteorology (GT-SC2)	3
PHYS 140	Introductory Physics (with laboratory) (GT-SC1)	4
Total Credits		25

Capstone Course Requirement

EDUC 409 Secondary Student Teaching fulfills the Capstone Requirement for students completing this emphasis.

Graduation Requirements

Undergraduate programs require a minimum of 120 semester credits for graduation. Of those 120 credits, 40 credits must be in upper-division courses (those marked 300 and above). Fifteen of these 40 upper-division credits must be earned in courses that are part of the standard or comprehensive major program being pursued.

Students are expected to review all graduation requirements, which can be found in the Western Undergraduate Catalog: Graduation Requirements (<https://catalog.western.edu/undergraduate/graduation-requirements/>).

Course	Title	Credits
Year One		
Fall		
BIOL 151	Diversity and Patterns of Life (with laboratory)	3-4
CHEM 111	General Chemistry I (GT-SC2)	3
CHEM 112	General Chemistry Laboratory I (GT-SC1)	1
ENG 102	Writing and Rhetoric I (GT-CO1)	3
HWTR 100	First Year Seminar	1
MATH 140	College Algebra (GT-MA1)	3
Credits		14-15
Spring		
Arts & Humanities GE		
BIOL 150	Biological Principles (with laboratory) (GT-SC1)	3-4
CHEM 113	General Chemistry II	3
CHEM 114	General Chemistry Laboratory II	1
ENG 103	Writing and Rhetoric II (GT-CO2)	3
Credits		13-14
Year Two		
Fall		
BIOL 301	General Ecology	3
CHEM 231	Introduction to Organic Chemistry and Biochemistry	3
CHEM 234	Introductory Organic and Biochemistry Laboratory	1
ESS 201 or BIOL 372	Essentials of Human Anatomy and Physiology (with Lab) or Human Anatomy and Physiology I (with laboratory)	4
MATH 141	Precalculus (GT-MA1)	4
Credits		15
Spring		
Arts & Humanities GE		
BIOL 310	Cell Biology	3
MATH 213	Probability and Statistics (GT-MA1)	3
PHYS 120	Meteorology (GT-SC2)	3
Social Science GE		
Credits		15
Year Three		
Fall		
Arts & Humanities GE		
BIOL 201 or BIOL 342	Introduction to Microbiology (with laboratory) or Microbiology (with laboratory)	4

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BIOL 312	Genetics (with recitation)	4
GEOL 101	Physical Geology (GT-SC2)	3
GEOL 105	Physical Geology Laboratory (GT-SC1)	1
Social Science GE		3
Credits		15
Spring		
EDUC 000	Education Gateway Course	0
EDUC 340	Application of Pedagogy and Practice	3
GEOL 201	Historical Geology (with laboratory)	3-4
PHYS 110	Introductory Astronomy (GT-SC2)	3
PHYS 140	Introductory Physics (with laboratory) (GT-SC1)	4
Social Science GE		3
Credits		16-17
Year Four		
Fall		
EDUC 403	Instruction & Assessment in Content Area	3
EDUC 404	Creating Positive Learning Environments	3
EDUC 405	Data-driven Instructional Practices	3
EDUC 409	Secondary Student Teaching	3
EDUC 424	Differentiation: Applying Learner-Centered Instruction	3
Credits		15
Spring		
EDUC 406	Content Area Literacy	3
EDUC 407	Maximizing Learning through 21st Century Skills	3
EDUC 409	Secondary Student Teaching	3
EDUC 429	Teaching English Learners for Secondary and K-12 Teachers	3
Credits		12
Total Credits		115-118