

Program Progression Guide

Disclaimer: The [2018-2019 Purdue West Lafayette catalog](#) is considered the source for academic and programmatic requirements for students entering programs during the Fall 2018, Spring 2019, and Summer 2019 semesters. The Program Progression Guide assists students in the development of an individualized 8-semester plan. Students are encouraged to use this guide, myPurduePlan* (online degree auditing tool) and the Student Educational Planner (SEP) as they work with their academic advisor towards the completion of their degree requirements.

Notification: Each student is ultimately responsible for knowing, monitoring and completing all degree requirements.

An undergraduate degree in the College of Science requires completion of the following degree requirements.

University Degree Requirements		
Minimum 2.0 Cumulative GPA	Minimum 120 Credits that fulfill degree requirements	32 Residency Credits (30000 and above) at a Purdue University campus
University Core Curriculum**		
<ul style="list-style-type: none"> Human Cultures: Behavioral/Social Science Human Cultures: Humanities Information Literacy Oral Communication <p>University Core Curriculum Course Listing</p>	<ul style="list-style-type: none"> Quantitative Reasoning Science Science, Technology & Society Selective Written Communication 	
Required Major Program Courses		
<p>Minimum 2.0 cumulative GPA in all biology courses required for this major. A minimum of 32 credits at or above the 300-level completed at a Purdue campus. At least one 500-level Biology course other than BIOL 54200.</p>		
College of Science Core Curriculum		
<ul style="list-style-type: none"> Freshman Composition – 3 credits Technical Writing and Presentation - 3 credits Teaming & Collaboration (NC) General Education - 9 credits 	<ul style="list-style-type: none"> Foreign Language & Culture – 9 credits Great Issues - 3 credits Laboratory Science - 8 credits Multidisciplinary - 3 credits 	<ul style="list-style-type: none"> Mathematics - 6-10 credits Statistics - 3 credits Computing - 3 credits
Degree Electives		
<p>Any Purdue or transfer course approved to meet degree requirements in accordance with individual departmental policies. Consult the No Count course list for courses, which may not be used to meet any College of Science degree requirement.</p>		

* This audit is not your academic transcript and it is not official notification of completion of degree or certificate requirements.

** University Core Curriculum Outcomes may be met through completion of the College of Science Core curriculum. Students should consult with their academic advisors and myPurdue Plan for course selections.

2018-19 Cell Molecular Development Biology Degree Progression Guide

The Biology Department has *suggested* the following degree progression guide for the Cell Molecular Development Biology Degree. Students will work with their academic advisors to determine their best path to degree completion. Course prerequisites are specific to this degree plan.

Credit	Fall 1st Year	Prerequisite	Credit	Spring 1st Year	Prerequisite
2	BIOL 12100		3	BIOL 13100	
2	BIOL 13500	CHM 12901 co-req	4	Organic Chem I Selective	CHM 11600 or 12901
5	CHM 12901	ALEKS 85	3-5	Calculus II Selective	Calculus I
3-5	Calculus I Selective		3	Language/Culture II Selective	Lang 10100
3	Language/Culture I Selective		3-4	ENGL 10600 or 10800	
1	Elective (BIOL 11500 pref)				
16-18			16-19		

Credit	Fall 2nd Year	Prerequisite	Credit	Spring 2nd Year	Prerequisite
3	BIOL 23100	CHM 116 co-req; BIOL 13100	3	BIOL 24100	BIOL 23100
2	BIOL 23200		2	BIOL 24200	
4	Organic Chem II Selective	Organic I	3-4	Chemistry Selective	
3	Language/Culture III Selective	Varies	2	BIOL 28600	BIOL 12100
3	Free Elective		1	Free Elective (BIOL 29300 pref)	
			3	General Education I Selective	
15			14-15		

Credit	Fall 3rd Year	Prerequisite	Credit	Spring 3rd Year	Prerequisite
3	Intermediate Requirement Selective	Varies	3	Cell/Molecular/Developmental Selective	
4	PHYS 1 Selective		4	PHYS 2 Selective	
3	General Education II Selective		3-4	Computer Science Selective	
3	Free Elective		1	Free Elective (BIOL 39300 pref)	
3	COM 21700		3	General Education III Selective	
			1	Free Elective	
16			15-16		

Credit	Fall 4th Year	Prerequisite	Credit	Spring 4th Year	Prerequisite
3	Cell/Molecular/Developmental Selective		3	Biology Selective	Varies
2-4	Base Lab Requirement		3	500-Level Biology Selective	
3	Free Elective		3	Great Issues Selective	
3	STAT 50300		4	Free Elective	
1-3	Multidisciplinary Selective				
12-16			13		

Courses in () are recommended.

College of Science Core Curriculum (SCC)

- | | |
|---------------------------------------|-----------------------|
| A. Freshman Composition | G. Laboratory Science |
| B. Technical Writing and Presentation | H. Multidisciplinary |
| C. Teaming and Collaboration | I. Mathematics |
| D. General Education | J. Statistics |
| E. Foreign Language and Culture | K. Computing |
| F. Great Issues | |

* Consult the University Core Requirement [course list](#) for approved courses.

CELL, MOLECULAR AND DEVELOPMENTAL BIOLOGY

Fall 2018

Graduation Requirements:

- A minimum 2.0 average in all biology courses required for this major
- A minimum of 32 credits at or above the 300-level completed at a Purdue campus
- At least one 500-level Biology course other than BIOL 54200
- 120 Total Credits

BIOLOGY:

1. BIOL 12100 Biology I: Diversity, Ecology and Behavior (2 cr.; fall) **or**
BIOL 19500 Biodiversity, Ecology & Evolution (3 cr.; fall)
2. BIOL 13100 Biology II: Development, Structure, and Function of Organisms (3 cr.; spring) **or**
BIOL 19500 Organismal Development & Physiology (3 cr.; spring)
3. BIOL 13500 1st Year Biology Lab (2 cr.; both) **or**
BIOL 14501 1st Year Biology Lab w/Neuro Research Project (2 cr.; fall) **or**
IT 22600 Biotechnology Lab (2 cr.; fall)
4. BIOL 23100 Biology III: Cell Structure and Function (3 cr.; fall)
5. BIOL 23200 Laboratory in Biology III: Cell Structure and Function (2 cr.; fall)
6. BIOL 24100 Biology IV: Genetics and Molecular Biology (3 cr.; spring)
7. BIOL 24200 Laboratory in Genetics and Molecular Biology (2 cr.; spring)
8. BIOL 28600 Intro. to Ecology and Evolution (2 cr.; spring)
9. **Intermediate Biology Selective: Choose one of these eight options:**
(**Cell, Molecular, and Developmental Biology majors must take BIOL 36700, 41500 or 42000 for this requirement.**)
 - A. BIOL 32800 Principles of Physiology (4 cr.; spring)
 - B. BIOL 36700¹ Principles of Development (2 cr.; spring) **plus** BIOL 36701¹ Principles of Development Laboratory (1 cr.; spring)
 - C. BIOL 39500 Macromolecules (3 cr.; fall)
 - D. BIOL 41500¹ Intro. to Molecular Biology (3 cr.; spring)
 - E. BIOL 41600 Viruses & Viral Diseases (3 cr.; spring)
 - F. BIOL 42000¹ Eukaryotic Cell Biology (3 cr.; fall)
 - G. BIOL 43600 Neurobiology (3 cr.; fall)
 - H. BIOL 43800 General Microbiology (3 cr.; fall)
10. **CMDB Selectives I:** (choose two)
 - A. BIOL 36700¹ Principles of Development (2 cr.; spring) **plus** BIOL 36701¹ Principles of Development Laboratory (1 cr.; spring)
 - B. BIOL 41500¹ Intro. to Molecular Biology (3 cr.; spring)
 - C. BIOL 42000¹ Eukaryotic Cell Biology (3 cr.; fall)
 - D. BIOL 48100² Eukaryotic Genetics (3 cr.; spring)
11. **Chemistry Selective One of these three courses:**
 - A. BCHM 56100 General Biochemistry I (3 cr.; fall)
 - C. CHM 33900³ Biochemistry: A Molecular Approach (3 cr.; spring)
 - B. CHM 53300 Introductory Biochemistry (3 cr.; fall)
12. **Lab Requirement:** Must meet Base Lab requirement as described on the back of this page.
13. **CMDB Selective II:** One of these six courses:
 - A. BIOL 51600⁴ Molecular Biology of Cancer (3 cr.; spring)
 - B. BIOL 55001⁴ Eukaryotic Molecular Biology (3 cr.; fall)
 - C. BIOL 59500⁴ Cellular Biology of Plants (3 cr.; alternate fall)
 - D. BIOL 59500⁴ Epigenetics in Human Disease (3 cr.; fall)
 - E. BIOL 59500⁴ Genetics and –Omics of Host-Microbe Interaction (3 cr.; fall)
 - F. BIOL 59500^{4,7} Theory of Molecular Methods (3 cr.; fall)
14. **Biology Selectives:** Three credits of the following:

BIOL 39500	Macromolecules (3 cr.; fall)	BIOL 54900	Microbial Ecology (2 cr.; alternate spring)
BIOL 41600	Viruses and Viral Diseases (3 cr.; spring)	BIOL 55001 ⁴	Eukaryotic Molecular Biology (3 cr.; fall)
BIOL 43200	Reproductive Physiology (3 cr.; alternate fall)	BIOL 55900	Endocrinology (3 cr.; fall)
BIOL 43600	Neurobiology (3 cr.; fall)	BIOL 56200 ⁵	Neural Systems (3 cr.; spring)
BIOL 43800	General Microbiology (3 cr.; fall)	BIOL 56310	Protein Bioinformatics (2 cr.; spring)
BIOL 43900 ⁷	Microbiology Lab (2 cr.; fall)	BIOL 58000	Evolution (3 cr.; spring)
BIOL 44400	Human Genetics (3 cr.; fall)	BIOL 58210 ⁷	Ecological Statistics (3 cr.; fall)
BIOL 44600	Molecular Biology of Pathogens (3 cr.; spring)	BIOL 58500	Ecology (3 cr.; fall)
BIOL 47800 ⁵	Intro to Bioinformatics (3 cr.; fall)	BIOL 58705	Animal Communication (3 cr.; alternate fall)
BIOL 48100 ²	Eukaryotic Genetics (3 cr.; spring)	BIOL 59100 ⁷	Field Ecology (4 cr.; alternate fall)
BIOL 48300 ⁶	Environmental & Conservation Biology (3 cr.; spring)	BIOL 59200	Evolution of Behavior (3 cr.; alternate spring)
BIOL 49500	Biological & Structural Aspects of Drug Design & Action (3 cr.; spring)	BIOL 59500 ⁴	Cellular Biology of Plants (3 cr.; fall)
BIOL 51100	Intro. to X-Ray Crystallography (3 cr.; spring)	BIOL 59500 ⁴	Epigenetics in Human Disease (3 cr.; fall)
BIOL 51600 ⁴	Molecular Biology of Cancer (3 cr.; spring)	BIOL 59500	Methods & Measurement in Physical Biochemistry (3 cr.; fall)
BIOL 51700	Molecular Biology: Proteins (2 cr.; spring)	BIOL 59500 ⁴	Genetics and –Omics of Host-Microbe Interaction (3 cr.; fall)
BIOL 52900	Bacterial Physiology (3 cr.; spring)	BIOL 59500 ⁷	Neural Mechanisms in Health & Disease (3 cr.; fall)
BIOL 53300	Medical Microbiology (3 cr.; fall)	BIOL 59500	Neurobiology of Learning & Memory (3 cr.; fall)
BIOL 53700	Immunology (3 cr.; spring)	BIOL 59500	Sensory Ecology (3 cr.; alternate spring)
BIOL 53800	Molecular, Cellular & Developmental Neurobiology (3 cr.; spring)	BIOL 59500 ^{5,7}	Theory of Molecular Methods (3 cr.; spring)
BIOL 54100	Molecular Genetics of Bacteria (3 cr.; fall)		

Footnotes and other requirements are on the back of this page.

Base Laboratory Requirement for all Biology Majors

1. Each student will satisfy each of the following three learning objectives:

Objective 1 – Research planning, literature review, and writing

Objective 2 – Observation, experimentation

Objective 3 – Analysis, simulation, and presentation

2. Objectives may be met by taking courses according the following chart:

Courses	Title	Objective 1	Objective 2	Objective 3
BIOL 43900 ⁷	Microbiology Lab	X	X	X
BIOL 44201	Protein Expression		X	X
BIOL 44202	Animal Physiology		X	X
BIOL 44205	LabView		X	X
BIOL 44207	Protein Structure		X	
BIOL 44211	Anatomy & Physiology		X	
BIOL 44212	Microscopy & Cell Bio		X	X
BIOL 44215	Physiology Measurements	X		X
BIOL 54200	Neurophysiology		X	X
BIOL 58210 ⁷	Ecological Statistics	X		X
BIOL 59100 ⁷	Field Ecology	X	X	X
BIOL 59500	CryoEM 3D Reconstruction		X	X
BIOL 59500	Data Analysis in Neurosci			X
BIOL 59500 ⁷	Theory of Molecular Methods	X		X
BIOL 59500 ⁷	Neural Mech in Hlth Disease	X		X

3. Students who successfully complete a Biology Honors Research Thesis have successfully met all three objectives.
4. Undergraduate Research may be used to meet these objectives. Student must get Research Mentor approval for each objective after that objective is completed. Student must also earn at least four credits of BIOL 49400 or 49900 research. Consult with your academic advisor for the forms used to obtain Research Mentor for each objective.
5. A combination of courses and research may be used to meet this requirement.

CHEMISTRY

1. General Chemistry:

- a. CHM 12901³ General Chemistry with a Biological Focus (5 cr.; fall)

2. Organic Chemistry Selectives: One of these two options:

- a. CHM 25500 Organic Chemistry (3 cr.; both) and CHM 25501 Organic Chemistry Lab (1 cr.; both) and CHM 25600 Organic Chemistry (3 cr.; both) and CHM 25601 Organic Chemistry Lab (1 cr.; both)
- b. CHM 26505 Organic Chemistry (3 cr.; fall) and CHM 26300 Organic Chemistry Lab (1 cr.; fall) and CHM 26605 Organic Chemistry (3 cr.; spring) and CHM 26400 Organic Chemistry Lab (1 cr.; spring)

PHYSICS Selectives:

One of these two options:

1. PHYS 23300 Physics for Life Sciences I (4 cr.; both) and PHYS 23400 Physics for Life Sciences II (4 cr.; both)
2. PHYS 17200 Modern Mechanics (4 cr.; both) and one of the following two choices:
 - A. PHYS 27200 Electric and Magnetic Interactions (4 cr.; both) or
 - B. PHYS 24100 Electricity and Optics (3 cr.; both) and PHYS 25200 Electricity and Optics Laboratory (1 cr.; spring)

UNIVERSITY CORE and COLLEGE OF SCIENCE CORE REQUIREMENTS

Composition and Presentation; Teambuilding and Collaboration; Language and Culture; Great Issues; General Education; Multidisciplinary Experience; Mathematics; Statistics; Computing (see handout).

FREE ELECTIVES

Approximately 12-24 credits

-
- ¹ Course(s) taken for the Intermediate Biology Selective may NOT overlap with requirement #10.
 - ² Course(s) taken for requirement #10 may NOT overlap with requirement #14.
 - ³ Students who select 12901 for General Chemistry must take CHM 33900 and 33901. Students who end up with Special Case approval for some other Gen Chem courses may choose the other Chem Selective options. Credit is not allowed for both BIOL 44201 and CHM 33901.
 - ⁴ Course chosen for requirement #13 may NOT overlap with requirement #14.
 - ⁵ This course may count for a Biology Selective and as the College of Science Multidisciplinary requirement.
 - ⁶ This course may count for a Biology Selective and as the College of Science Great Issues requirement.
 - ⁷ Course chosen for requirement #13 or 14 may NOT count toward the Base Laboratory requirement.