

Program Progression Guides

Disclaimer: The [2023-2024 Purdue West Lafayette catalog](#) is considered the source for academic and programmatic requirements for students entering programs during the Fall 2023, Spring 2024, and Summer 2024 semesters. The Program Progression Guide assists students in the development of an individualized 8-semester plan. Students are encouraged to use this guide and MyPurduePlan* (online degree auditing tool) 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-level and above) at a Purdue University campus
University Core Curriculum** https://www.purdue.edu/provost/students/s-initiatives/curriculum/courses.html		
<ul style="list-style-type: none"> Human Cultures: Behavioral/Social Science Human Cultures: Humanities Information Literacy Oral Communication 	<ul style="list-style-type: none"> Quantitative Reasoning Science Science, Technology & Society Selective Written Communication 	
Civic Literacy Proficiency https://www.purdue.edu/provost/about/provostInitiatives/civics/		
Required Major Program Courses (see following pages)		
Departmental specific requirements, including 2.0 average GPA in classes required to fulfill biology requirements. Minimum 2.0 cumulative GPA Must have a 500-level BIOL course (2-3 credit approved BIOL lecture)		
College of Science Core Curriculum https://www.purdue.edu/science/Current_Students/curriculum_and_degree_requirements/college-of-science-core-requirements.html?		
<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 STS (Science, Tech & Society) - 3 credits 	<ul style="list-style-type: none"> Mathematics - 6-10 credits Statistics - 3 credits Computing - 3 credits
Degree Electives		
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.		

* 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.

2023-24 Chemical Biology and Biochemistry Degree Progression Guide

The Department of Biological Sciences has suggested the following degree progression guide for the Chemical Biology and Biochemistry Degree. Students will work with their academic advisors to determine their best path to degree completion. Course pre-requisites listed are notes specific to this degree plan (not all pre-requisites are listed for every course).

Credit	Fall 1st Year	Prerequisite	Credit	Spring 2nd Year	Prerequisite
2	BIOL 12100		3	BIOL 13100	
5	CHM 12901	ALEKS 85 or Calc Placement	2	BIOL 13500 or 19500	CHM 12901
4-5	MA 16100 or 16500	ALEKS 85	4	CHM 25500-25501	CHM 12901
3-4	Science Core Option		4-5	MA 16200 or 16600	MA 16100 or 16500
1	BIOL 11500 or CHM 19400	BIOL 12100 co-req	3	Science Core Option	
15-17			16-17		

Credit	Fall 2nd Year	Prerequisite	Credit	Spring 2nd Year	Prerequisite
3	BIOL 23100	BIOL 13100 and co-req CHM 12901	3	BIOL 24100	BIOL 23100
2	BIOL 23200	Co-req BIOL 23100	2	BIOL 24200	
4	CHM 25600-25601	CHM 25500	3	CHM 33900	C- or better in prior CHM courses
3	Science Core Option		1	CHM 33901	CHM 33900 co-req
3	Science Core Option		2	BIOL 28600	BIOL 12100
			3-4	CS 17700 or 18000	
15			14-15		

Credit	Fall 3rd Year	Prerequisite	Credit	Spring 3rd Year	Prerequisite
3	BIOL 42000	BIOL 23100 & 24100	3	BIOL 41500	BIOL 23100 & 24100
3	CHM 34800 (Bioinorganic Chemistry)	CHM 33900	4	PHYS II Selective	PHYS I
4	PHYS I Selective	(BIOL, CHM, MA)	4	CHM 37200	Calc 2; CHM 12901 or 25500
3	Science Core Option		3	Science Core Option	
1-2	BIOL 494/499 or CHM 49900 (research)	See approved list	1-2	BIOL 494/499 or CHM 49900 (research)	See approved list
3	Free Elective				
17-18			15-16		

Credit	Fall 4th Year	Prerequisite	Credit	Spring 4th Year	Prerequisite
3	BIOL 59500 (Meth Meas Phys Biochem)* or CHM 56000 (Org Spectroscop Analys)**	*PHYS 1&2; Calc 2 **Organic chem 2	3	BIOL 53601 or 59500 (CryoEM 3D Reconstruction or 59500 (X-ray Crystallography)	PHYS 2 Co-Req
2-3	BIOL 49500/CHM 49000 (Research Capstone)		2-4	BIOL 49500/CHM 49000 (Research Capstone)	
3	CHM 29000 (Bioanalytical Chemistry)	CHM 33900+33901	3	STAT 50300	Calc 2
3	Science Core Option		3-4	Science Core Option	
3	Science Core Option		3	Free Elective	
14-15			14-17		

Science Core Curriculum Options

(one course needed for each requirement unless otherwise noted)

Options recommended for first- and second-year students	Options recommended for third- and fourth-year students
Freshman Composition ^{UC} General Education ^{UC} (3 courses needed) Foreign Language and Culture ^{UC} (3 courses needed) STS ^{UC} (BIOL 12100 satisfies)	Technical Writing and Presentation ^{UC} (COM 217 recommended) Statistics (STAT 50300) Computing (CS 17700 or CS 18000 also meet Teambuilding) Great Issues

^{UC} Select courses may also satisfy a University Core Curriculum requirement; see the University Core Requirement [course list](#) for approved courses. Students must have 32 credits at the 30000 level or above taken at Purdue.

CHEMICAL BIOLOGY AND BIOCHEMISTRY (CBB)

Fall 2023

Graduation Requirements:

- A minimum 2.0 average in all biology courses required for this major
- At least one approved 2-3 credit **500-level Biology** course is required- (excludes lab only courses such as BIOL 54200 & 5xxxx lab modules).
- A minimum of 32 credits at or above the 300-level completed at a Purdue campus
- 120 Total Credits

BIOLOGY CORE (19 credits):

1. BIOL 12100 Biology I: Diversity, Ecology and Behavior (2 cr.; fall)
2. BIOL 13100 Biology II: Development, Structure, and Function of Organisms (3 cr.; spring)
3. BIOL 13500 1st Year Biology Lab (2 cr.; both) **or**
BIOL 19500 Year I Bio Lab: Diet, Disease & the Immune System (2 cr.; spring) **or**
BIOL 19500 Year I Bio Lab: Disease Ecology (2 cr.; alternate fall) **or**
BIOL 19500 Year I Bio Lab: Phages to Folds (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 & Evolution (2 cr.; spring)

CHEMISTRY CORE (13 credits):

9. CHM 12901 General Chemistry with a Biological Focus (5 cr.; fall)
10. CHM 25500 Organic Chemistry (3 cr.; both)
11. CHM 25501 Organic Chemistry Lab (1 cr.; both)
12. CHM 25600 Organic Chemistry (3 cr.; both)
13. CHM 25601 Organic Chemistry Lab (1 cr.; both)

UPPER-LEVEL BIOLOGY & CHEMISTRY COURSEWORK (32-33 credits):

14. BIOL 41500 Intro to Molecular Biology (3 cr.; spring) **satisfies Biology Intermediate requirement**
15. BIOL 42000 Eukaryotic Cell Biology (3 cr.; fall)
16. CHM 33900 Biochemistry: A Molecular Approach (3 cr.; spring)
17. CHM 33901 Biochemistry Laboratory (1 cr.; spring)
18. CHM 34800 Bioinorganic Chemistry (3 cr.; fall)
19. CHM 37200 Physical Chemistry (4 cr.; spring)
20. CHM 29000 Bioanalytical Chemistry (3 cr.; fall) (*might be renamed CHM 31700 Bioanalytical Chem in Fall 2024*)
21. **CBB Selective 1 (3 credits) -- ONE of these:**
 - A. BIOL 59500 Methods & Measurement in Biophysical Chemistry (3 cr.; fall)
 - B. CHM 56000 Organic Spectroscopic Analysis (3 cr.; fall)
22. **CBB Selective 2 (3 credits) -- ONE of these:**
 - A. BIOL 53601 Biological and Structural Aspects of Drug Design and Action (3 cr.; spring)
 - B. BIOL 59500 CryoEM 3D Reconstruction (3 cr.; fall)
 - C. BIOL 59500 X-ray Crystallography (3 cr.; fall)
23. **CBB-related research (2-3 credits) – must be in approved lab – see next page:**
At least 2 semesters of research are required after successful completion of BIOL 23100 and 24100
 - A. BIOL 49400 Biology Research **or**
 - B. BIOL 49900 Biology Honors Thesis Research **or**
 - C. CHM 49900 Special Assignments
24. **CBB Research Capstone (4 credits): take twice (2 credits each time)**
BIOL 49500 or CHM 49000 CBB Research Capstone
(*Base Lab requirement met with CBB Research Capstone Course*)
(*CBB Research Capstone is in addition to CBB-related research*)

MATH (8-10 credits) -- CBB Majors must complete calculus 1 and 2 courses from the list below:

MA 16100 or MA 16500 for calculus 1 (4 or 5 cr.; both) **and** MA 16200 or MA 16600 for calculus 2 (4 or 5 cr.; both)

PHYSICS (8 credits) -- 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)

OTHER: all University Core, College of Science Core, and Civics Literacy Requirements must also be completed.

FREE ELECTIVES: Approximately 0 - 6 credits

NOTE: CBB majors are NOT eligible to earn a Biology minor or a Chemistry minor.

REQUIRED RESEARCH FOR THE CBB MAJOR

Research is required for this major. Students can participate in research as early as they can find a relevant opportunity but must start at least by Fall of Junior year. Research that will count towards the CBB major requirements needs to be related to Chemical Biology & Biochemistry topics. Below are examples of such topics. To be sure their research experience will count for CBB requirements, students need to work with one of the Faculty within the Biology and Chemistry Departments whose research is CBB-related as shown in the table below. Once a student finds a research opportunity and is joining a lab they need to request an application for research from their Academic Advisor.

Examples of topics related to Chemical Biology & Biochemistry

- Chemical principles of biological processes
- Chemical processes in living organisms
- Molecular biology
- Structural biology
- Enzymes and enzyme activity
- Drug development
- Lipid membrane
- Protein

Biology & Chemistry Faculty with CBB-Related Research	
Biology Faculty	Chemistry Faculty
Allen-Petersen, Brittany	Chmielewski, Jean
Chang, Henry	Chopra, Gaurav
Chang, Leifu	Das, Chittaranjan
Csonka, Laszlo	Drown, Bryon
Gelvin, Stanton	Lipton, Lipton
Gribskov, Michael	Low, Philip
Hanna, Jason	Low-Nam, Shalini
Jiang, Wen	Lyon, Angeline
Kasinski, Andrea	Mao, Chengde
Kihara, Daisuke	Parkinson, Betsy
Kuhn, Richard	Reppert, Mike
Luo, Zhao-Qing	Shah, Kavita
Metskias, Lauren Ann	Sintim, Herman
Mesecar, Andrew	Tao, Andy
Noinaj, Nicholas	Thompson, David
Stauffacher, Cynthia	Tian, Shiliang
Tesmer, John	Wilker, Jonathan
	Zhong-Yin Zhang