PURDUE UNIVERSITY

Chemical Biology and Biochemistry (CBB)

College of Science

2025-2026

Program Progression Guides

Disclaimer: The 2025-2026 Purdue West Lafayette catalog is considered the source for academic and programmatic requirements for students entering programs during Fall 2025, Spring 2026 and/or Summer 2026. 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		
• Human Cultures: Behavioral/Social Science • Human Cultures: Humanities • Information Literacy • Oral Communication	• 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?		
• Written Communication – 3 credits • Technical Writing and Presentation - 3 credits • Teaming & Collaboration (NC) • General Education - 9 credits	• Language & Culture – 9 credits • Great Issues - 3 credits • Laboratory Science - 8 credits • STS (Science, Tech & Society) - 3 credits	• 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. -The College of Science has identified courses that are below the disciplinary level of each program and major area of study. While similar, Not Recommended course lists vary between departments.		

* 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.

2025-26 Chemical Biology and Biochemistry (CBB)
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. Pre-requisite notes are specific to this degree plan (they may change; not all are listed for every course).

Credit	Fall 1st Year	Prerequisite	Credit	Spring 1st Year	Prerequisite
2	BIOL 12100		3	BIOL 13100	
5	CHM 12901	ALEKS 85 or Calc Placement	2	BIOL 13500 or 1450x	BIOL 121 or 131 concurrent
4-5	MA 16100 or 16500	ALEKS 85	4	CHM 25500 & 25501	D or better in CHM 12901
3	Science Core Option		4-5	MA 16200 or 16600	C- or better in MA 16100 or 16500
1	BIOL 11500	BIOL 12100 co-req	3	Science Core Option	
15-16			**16-17**		

Credit	Fall 2nd Year	Prerequisite	Credit	Spring 2nd Year	Prerequisite
3	BIOL 23100	(BIOL 13100) and (CHM 12901 concurrent)	3	BIOL 24100	BIOL 23100
2	BIOL 23200	BIOL 23100 concurrent	2	BIOL 24200	BIOL 24100 concurrent
4	CHM 25600 & 25601	C- or better in CHM 25500	4	CHM 33900 & 33901	C- or better in CHM 25600
3	Science Core Option		2	BIOL 28600	BIOL 12100
3	Science Core Option		3	Science Core Option	
			3	Science Core Option	
15			**17-18**		

Credit	Fall 3rd Year	Prerequisite	Credit	Spring 3rd Year	Prerequisite
3	BIOL 42000	BIOL 231 & 241	3	BIOL 41500	BIOL 231 & 241
4	BIOL 32701 Bioanalytical Chemistry (cross-listed with CHM 32700)	CHM 33900+33901	4	PHYS II Selective	PHYS I
4	PHYS I Selective	BIOL, CHM, MA (varies)	3-4	CBB Selective II (or CHM 37200 Phys Chem)	(varies)
3	Science Core Option		3	Science Core Option	
1-2	Research (BIOL 494/499 or CHM 499)	Approved list pg 4	1-2	Research (BIOL 494/499 or CHM 499)	Approved list pg 4
15-17			**15-16**		

Credit	Fall 4th Year	Prerequisite	Credit	Spring 4th Year	Prerequisite
3	BIOL 51202 Meth Meas Biophys Chem* or CHM 56000 Org Spectroscop Analys**	*PHYS 1; CHM 339 **Organic chem 2	4	CHM 37200 Phys Chem (or CBB Selective II)	(varies)
3-4	CS 17700 recc'd (or STAT 50300)	(C- or better calc 2)	3	BIOL 49500/CHM 49900 (CBB Capstone)	BIOL 32701 or CHM 32700
3	CHM 34800 (Bioinorganic Chemistry)	CHM 33900	3-4	STAT 50300 (or CS 17700 recc'd)	C- or better calc 2
3	Science Core Option		3	Science Core Option	
3	Research (or Free Elective)		3	Research (or Free Elective)	
15-16			**16-17**		

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
Written Communication[UC]	Technical Writing and Presentation[UC] (COM 217 recommended)
General Education[UC] (9 credits needed)	Statistics (STAT 50300)
Foreign Language and Culture[UC] (9 credits needed with JEDI)	Computing (CS 17700 or CS 18000 also meet Teambuilding)
Science Tech and Society[UC] (BIOL 12100)	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 2025

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 like BIOL 542xx & 59500 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 14503 First Yr Bio Lab Dis Ecol-Hnrs (2 cr.; alternate fall) **or**
   BIOL 14504 First Yr Lab Diet Disease Immun Sys-Hnrs (2 cr.; spring) **or**
   BIOL 14505 First Yr Lab Phages Folds-Hnrs (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. BIOL 32701 Bioanalytical Chemistry (3 cr.; fall) *(cross listed with CHM 32700)*
19. CHM 34800 Bioinorganic Chemistry (3 cr.; fall)
20. CHM 37200 Physical Chemistry (4 cr; spring)
21. **CBB Selective I** (3 credits) -- ONE of these:
    A. BIOL 51202 Methods & Measures in Biophysical Chem (3 cr.; fall)
    B. CHM 56000 Organic Spectroscopic Analysis (3 cr.; fall)
22. **CBB Selective II** (3 credits) -- ONE of these:
    A. BIOL 51101 X-ray Crystallography (3 cr.; spring)
    B. BIOL 53601 Biological & Structural Aspects of Drug Design and Action (3 cr.; spring)
    C. CHM 43800 Introduction to Molecular Biotech (3 cr.; spring)
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** (3 credits):
    A. BIOL 49500 Capstone in Chemical Biology (or CHM 49900 Capstone in Chemical Biology)
    (CBB Capstone meets the Base Lab requirement; CBB 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 and must be related to Chemical Biology & Biochemistry topics with a pre-approved lab. Below are examples of such topics along with a list of acceptable research faculty. Students can participate in research as early as they can find a relevant opportunity but must start at least by Fall of Junior year. Once a student finds a research opportunity and is joining a lab, they need to request an Undergraduate Research Application from their Biology Academic Advisor to gain approval to earn BIOL 49400 or 49900 credit.

<u>Examples of topics related to Chemical Biology & Biochemistry</u>

- 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	Chen, Ming
Chang, Henry	Chmielewski, Jean
Chang, Leifu	Chopra, Gaurav
Gelvin, Stanton	Cochrane, Wesley
Gribskov, Michael	Das, Chittaranjan
Hanna, Jason	Drown, Bryon
Jiang, Wen	Ghosh, Arun
Kasinski, Andrea	Kenttämaa, Hilkka
Kihara, Daisuke	Laskin, Julia
Kuhn, Richard	Lipton, Mark
Luo, Zhao-Qing	Low-Nam, Shalini
Metskas, Lauren Ann	Lyon, Angeline
Mesecar, Andrew	Mao, Chengde
Noinaj, Nicholas	Parkinson, Elizabeth (Betsy)
Stauffacher, Cynthia	Reppert, Mike
Tesmer, John	Schlebach, John
	Tao, W. Andy
	Thompson, David
	Tian, Shiliang
	Wei, Alex
	Wilker, Jonathan
	Zacharioudakis, Emmanouil
	Zhang, Jesse Chi
	Zhong-Yin Zhang
OTHER - FACULTY NAME	***OTHER - DEPT***
Stahelin, Robert V.	MCMP