DEPARTMENT OF BIOCHEMISTRY

BCHM 100 Syllabus
Fall 2025

COURSE INFORMATION

Course number: BCHM10000
Course title: Introduction to Biochemistry
CRN: 11888
Meeting time: Tuesday and Thursdays, 9:30 – 10:20 AM
Instructional modality: Face-to-Face
Credit Hours: 2
Course Brightspace: https://purdue.brightspace.com/d2l/login

INSTRUCTOR: Dr. Kyle Cottrell
office: HANS 213
TEL: 494-6941
e-mail: kacottre@purdue.edu
Office hours: By appointment, request via email

TEACHING ASSISTANTS:
name: Jacob Fawley
e-mail: fawleyj@purdue.edu
Office hours: *Via zoom/in-person: link and details will be provided on Brightspace*

name: Christine Habib
e-mail: habibc@purdue.edu
Office hours: *Via zoom/in-person: link and details will be provided on Brightspace*

COURSE DESCRIPTION

A survey of modern biochemistry using case studies that highlight general theories and unifying concepts. This course is open to all majors and does not require any college science courses as background or prerequisite.

LECTURES

Tuesday and Thursday, STEW 320, 9:30 – 10:20 AM. Lectures will be given in-person, but all lectures will generally be recorded, and will be available for students who miss a class or who would like to review a lecture via Brightspace. Recordings may be disrupted by technical issues, as such students shouldn't expect that all recordings will be useable.

OFFICE HOURS

The TA will hold virtual office hours via zoom and/or in-person each week – please see Brightspace for details. Questions can be submitted in advance in writing for those who cannot be online at the appointed time but have a question they would like answered.

COURSE OBJECTIVES

Students in BCHM 100 aren't necessarily biochemists. Some have future career interests in human or veterinary medicine, plant sciences, and pharmacy, but many just want to understand how living things "work". In this course, we will explore what happens when things "stop working" as a way to understand topics as varied as human disease, nerve gases, herbicides, and Siamese cats. In doing so, we will explore the scale, structure, and function of small molecules and proteins and learn to visualize biochemical molecules and processes. In parallel, we will discuss these topics in the context of technologies and issues relevant to society such as the development and deployment of transgenic plants and the consequences of genetic conditions such as PKU and sickle cell anemia.

LEARNING OUTCOMES

- BCHM 100 students will understand the molecular principles of life based on the core disciplines of biology, chemistry and physics.
- BCHM 100 students will understand the scientific method.
- BCHM students will appreciate the ethical issues facing professionals in the life sciences.
- BCHM 100 students will understand the contributions of our discipline to society, including improvements to medicine, agriculture, the economy and the environment.

Additional, module-specific learning outcomes are listed in Brightspace at the beginning of each module.

LEARNING RESOURCES

Textbook: There is no recommended textbook for this course. Links to appropriate web resources for additional reading will be provided in your lectures notes and online.

Technology: Many lecture activities will require the use of a laptop or tablet computer. Necessary software (Pymol) can be downloaded via the links provided on Brightspace.

Brightspace: The syllabus for the course and lecture notes will be available via the Purdue University Brightspace site at: https://purdue.brightspace.com/d2l/login

Artificial Intelligence and Large Language Models: See section titled AI

ASSIGNMENTS AND POINTS

The grading for this course will be as follows:

Midterm Exam	100 points
Final Exam	100 points
Quizzes (5 @ 20 points each)	100 points
Assignments (5 @ 20 points)	100 points

There are six quizzes and six homework assignments throughout the course. If you choose to do all of these, only the top five scores for each will count toward your final grade. Alternatively, you can choose to simply skip a quiz or homework, in which case a grade of zero will be recorded and that quiz or homework assignment grade will be dropped as your lowest grade.

The final exam will not be cumulative but the second half course material depends heavily on the material covered in the first half of the course. I strongly advise that you review the major concepts covered in the first half of the course as part of your studying for the final exam.

AI detection programs, like Turnitin Originality Checker, will not be used in this course.

GRADING SCALE

The cutoff values for letter grades are as follows:

360 points	A
320 points	B
280 points	C
240 points	D
239 points and below	F

Failing to submit a quiz or exam during the designated time period will result in a grade of 0 being recorded unless documented justification is presented. Any request to be excused from a quiz or exam must include official documentation (doctor's note, request from academic advisor, etc.) explaining why the exam was or will be missed. If a quiz or exam is excused, a makeup evaluation may be scheduled by the instructor.

If you have any disagreements with the way any of your quizzes or exams have been graded, please consult the grading key and then discuss them with the lecture TA. In the event this does not resolve your concerns, please take them up with the instructor.

Requests for re-grades must be submitted no later than the end of the second class period after the graded test or assignment has been returned.

The final date to withdraw from a course with a W for Fall 2025 is Tuesday, November 25th.

EXTRA CREDIT

There will be no opportunity for extra credit.

OBTAINING EXTRA HELP

TAs will hold office hours for at least 3 hours per week in-person, and will be able to answer additional questions, also online, by appointment.

CLASS ATTENDANCE

This is an in-person lecture course, so attendance is encouraged. Only the instructor can excuse a student from a course requirement or responsibility. When conflicts can be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency conflict, when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email, through Brightspace, or by phone. When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and in cases of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of the Dean of Students via email or phone at 765-494-1747. Our course Brightspace includes a link on Attendance and Grief Absence policies under the University Policies menu.

ACADEMIC GUIDANCE IN THE EVENT A STUDENT IS QUARANTINED/ISOLATED

If you become quarantined or isolated at any point in time during the semester, in addition to support from the Protect Purdue Health Center, you will also have access to an Academic Case Manager who can provide you academic support during this time. Your Academic Case Manager can be reached at acmq@purdue.edu and will provide you with general guidelines/resources around communicating with your instructors, be available for academic support, and offer suggestions for how to be successful when learning remotely. Importantly, if you find yourself too sick to progress in the course, notify your academic

case manager and notify me via email or Brightspace. We will make arrangements based on your particular situation. The Office of the Dean of Students (odos@purdue.edu) is also available to support you should this situation occur.

PROTECT PURDUE PLAN

The Protect Purdue Plan, which includes the Protect Purdue Pledge, is campus policy and as such all members of the Purdue community must comply with the required health and safety guidelines. Required behaviors in this class include: staying home and contacting the Protect Purdue Health Center (496-INFO) if you feel ill or know you have been exposed to the virus, wearing a mask in classrooms and campus buildings, at all times (e.g., no eating/drinking in the classroom), disinfecting desk/workspace prior to and after use, maintaining proper social distancing with peers and instructors (including when entering/exiting classrooms), refraining from moving furniture, avoiding shared use of personal items, maintaining robust hygiene (e.g., handwashing, disposal of tissues) prior to, during and after class, and following all safety directions from the instructor.

Students who are not engaging in these behaviors (e.g., wearing a mask) will be offered the opportunity to comply. If non-compliance continues, possible results include instructors asking the student to leave class and instructors dismissing the whole class. Students who do not comply with the required health behaviors are violating the University Code of Conduct and will be reported to the Dean of Students Office with sanctions ranging from educational requirements to dismissal from the university.

Any student who has substantial reason to believe that another person in a campus room (e.g., classroom) is threatening the safety of others by not complying (e.g., not wearing a mask) may leave the room without consequence. The student is encouraged to report the behavior to and discuss next steps with their instructor. Students also have the option of reporting the behavior to the Office of the Student Rights and Responsibilities. See also Purdue University Bill of Student Rights.

ACADEMIC MISCONDUCT

Academic misconduct of any kind will not be tolerated in any course offered by the Department of Biochemistry. Information on Purdue's policies with regard to academic misconduct can be found at http://www.purdue.edu/studentregulations/student_conduct/regulations.html

Any incidence of academic misconduct will be reported to the Office of the Dean of Students. Academic misconduct may result in disciplinary sanctions including expulsion, suspension, probated suspension, disciplinary probation, and/or educational sanctions. In addition, such misconduct will result in punitive grading such as:

- receiving a lower or failing grade on the assignment, or
- assessing a lower or failing grade for the course

Punitive grading decisions will be made after consultation with the Office of the Dean of Students. Please note reported incidences of academic misconduct go on record for reference by other instructors. Further, a record of academic misconduct is likely to influence how current/future situations are handled.

To provide you with an unambiguous definition of academic misconduct, the following text has been excerpted from "Academic Integrity: A Guide for Students", written by Stephen Akers, Ph.D., Executive Associate Dean of Students (1995, Revised 1999, 2003), and published by the Office of the Dean of Students in cooperation with Purdue Student Government, Schleman Hall of Student Services, Room 207, 475 Stadium Mall Drive West Lafayette, IN 47907-2050.

"Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, *Student Regulations*] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking

examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

More specifically, the following are a few examples of academic dishonesty which have been discovered at Purdue University.

- substituting on an exam for another student
- substituting in a course for another student
- paying someone else to write a paper and submitting it as one's own work
- giving or receiving answers by use of signals during an exam
- copying with or without the other person's knowledge during an exam
- doing class assignments for someone else
- plagiarizing published material, class assignments, or lab reports
- turning in a paper that has been purchased from a commercial research firm or obtained from the internet
- padding items of a bibliography
- obtaining an unauthorized copy of a test in advance of its scheduled administration
- using unauthorized notes during an exam
- collaborating with other students on assignments when it is not allowed
- obtaining a test from the exam site, completing and submitting it later
- altering answers on a scored test and submitting it for a regrade
- accessing and altering grade records
- stealing class assignments from other students and submitting them as one's own
- fabricating data
- destroying or stealing the work of other students

Plagiarism is a special kind of academic dishonesty in which one person steals another person's ideas or words and falsely presents them as the plagiarist's own product. This is most likely to occur in the following ways:

- using the exact language of someone else without the use of quotation marks and without giving proper credit to the author
- presenting the sequence of ideas or arranging the material of someone else even though such is expressed in one's own words, without giving appropriate acknowledgment
- submitting a document written by someone else but representing it as one's own”

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

For information on how AI and LLMs apply to academic integrity in this course, please see the section titled **AI**.

The Purdue Honor Pledge “As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue"

NOTICE OF COPYRIGHT PROTECTION OF COURSE MATERIALS

Among the materials that may be protected by copyright law are the lectures, notes, and other material presented in class or as part of the course. Always assume the materials presented by an instructor are protected by copyright unless the instructor has stated otherwise. Students enrolled in, and authorized

visitors to, Purdue University courses are permitted to take notes, which they may use for individual/group study or for other non-commercial purposes reasonably arising from enrollment in the course or the University generally.

Notes taken in class are, however, generally considered to be “derivative works” of the instructor’s presentations and materials, and they are thus subject to the instructor’s copyright in such presentations and materials. No individual is permitted to sell or otherwise barter notes, either to other students or to any commercial concern, for a course without the express written permission of the course instructor. To obtain permission to sell or barter notes, the individual wishing to sell or barter the notes must be registered in the course or must be an approved visitor to the class. Course instructors may choose to grant or not grant such permission at their own discretion, and may require a review of the notes prior to their being sold or bartered. If they do grant such permission, they may revoke it at any time, if they so choose.

EMERGENCY PREPAREDNESS

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. To get information about changes in this course consult the class Brightspace site or e-mail or phone the instructor.

ON-LINE COURSE EVALUATIONS

During the last two weeks of the semester, you will be provided an opportunity to evaluate this course and your instructor(s). During the last week of classes, you will receive an official email from evaluation administrators with a link to the online evaluation site. You will have two weeks to complete this evaluation. Your participation in this evaluation is an integral part of this course. Your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

NON-DISCRIMINATION POLICY

Purdue University’s non-discrimination policy will be upheld in this classroom. Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. Link to Purdue’s nondiscrimination policy statement.

Purdue University views, evaluates, and treats all persons in any University related activity or circumstance in which they may be involved, solely as individuals on the basis of their own personal abilities, qualifications, and other relevant characteristics.

In this course, each voice in the classroom has something of value to contribute. Please take care to respect the different experiences, beliefs and values expressed by students and staff involved in this course. We support Purdue's commitment to diversity, and welcome individuals of all ages, backgrounds, citizenships, disability, sex, education, ethnicities, family statuses, genders, gender identities, geographical locations, languages, military experience, political views, races, religions, sexual orientations, socioeconomic statuses, and work experiences

For more information, see http://www.purdue.edu/purdue/ea_eou_statement.html.

MENTAL HEALTH

Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 or http://www.purdue.edu/caps/ after hours, on weekends and holidays, or by going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.

STUDENTS WITH DISABILITIES

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: **drc@purdue.edu** or by phone: 765-494-1247.

EMERGENCY PREPARATION

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

Guidelines regarding ensuring access to emergency information:

- *Keep your cell phone on to receive a Purdue ALERT text message.*
- *Log into a Purdue computer connected to the network to receive any Desktop Popup Alerts.*
- *If you have a "no cell phone" in class policy allow one or two students who have signed up for Purdue ALERT to keep their phones on to receive any alerts*

AI

Advancements in Artificial Intelligence (AI) provide students with unparalleled access to information and problem-solving capabilities. However, with these advantages come the responsibilities of ethical use and academic integrity. This statement outlines the expectations and guidelines for the responsible use of AI in our course.

Objectives: By adhering to these guidelines, students aim to:

1. Uphold academic honesty and personal integrity.
2. Ensure equitable access and opportunities for all students.
3. Develop skills for critical thinking and independent reasoning.
4. Understand the strengths and limitations of AI tools.

Guidelines for Responsible Use:

1. Original Work: Students should ensure that assignments submitted are original and based on their understanding. While AI can assist in research or provide general guidance, it should not produce work on behalf of the student.

2. Citation: Any content, ideas, or assistance obtained through AI tools must be appropriately cited, similar to any other reference or source. You will need to go and find the relevant citations from the primary literature (journal articles)!

3. Collaboration: If a student collaborates with AI tools, (And you are encouraged to do so in this course!) they must specify the nature and extent of this collaboration in their submission. This includes providing details of the prompts used to generate the AI responses.

4. Prohibited Uses: AI should not be used to complete quizzes, exams, or any other assessments unless explicitly permitted by the instructor.

5. Accessibility: All students must have equal access to AI tools. If a particular tool is used in a course, it should be free of cost for all users.

6. Data Privacy: Students must be cautious when sharing personal or sensitive information with AI platforms and should be familiar with the terms of service of any third-party AI tools.

Consequences for Misuse: Misuse of AI tools in coursework, which includes but is not limited to producing unoriginal work, uncited use of AI-generated content, or unauthorized assistance on assessments, will be considered a breach of academic integrity. Consequences will follow the Purdue's policies on academic dishonesty as detailed in this syllabus, which may include grade penalties, course failure, or more severe disciplinary actions.

This section was adapted from: **https://www.purdue.edu/innovativelearning/teaching/wp-content/uploads/sites/2/2023/11/BCHM-309-Syllabus-Fall-2023_pg13_14.pdf)**

DISCLAIMER

This syllabus is subject to change.

LECTURE SCHEDULE – *approximate dates for lecture topics shown*

26-Aug	Module 1 - Introduction	
28-Aug	Module 2 – Scale/organization	
2-Sep	Module 3 – Case study 1: PKU I	HW1 due
4-Sep	Module 3 – Case study 1: PKU I	
9-Sep	Module 4 - central dogma	HW2 due
11-Sep	Module 4 - central dogma	QUIZ 1
16-Sep	Module 5 - Case study 1: PKU II	
18-Sep	Module 5 - Case study 1: PKU II	
23-Sep	Module 5 - Case study 1: PKU II	
25-Sep	Module 6 – amino acids	QUIZ 2
30-Sep	Module 6 – amino acids	HW3 due
2-Oct	Module 7 - Case study 2: alkaptonuria, HW4 during lecture	
7-Oct	Module 8 – protein structure and function	
9-Oct	Module 8 – protein structure and function	QUIZ 3
14-Oct	**FALL BREAK - No Lecture**	
16-Oct	Module 8 – protein structure and function	HW4 due
21-Oct	*Mid-term exam review* (TA only)	
23-Oct	**MIDTERM EXAM – no lecture**	**MIDTERM**
28-Oct	Module 9 - Case study 3: insecticides and nerve gases	
30-Oct	Module 9 - Case study 3: insecticides and nerve gases	
4-Nov	Module 10 - Enzymes	
6-Nov	Module 10 - Enzymes	QUIZ 4
11-Nov	Module 11 - Case study 4: Roundup and enzyme inhibition	
13-Nov	Module 11 - Case study 4: Roundup and enzyme inhibition	HW5 due

18-Nov	Module 12 - Case study 5: Antibiotics	QUIZ 5
20-Nov	Module 12 - Case study 5: Antibiotics	
25-Nov	Module 13 - Case study 6: Sickle Cell Anemia	
27-Nov	**Thanksgiving - No Lecture**	
2-Dec	Module 13 - Case study 6: Sickle Cell Anemia	HW6 due
4-Dec	Module 14 - Case study 7: Drugging KRAS	QUIZ 6
9-Dec	Module 14 - Case study 7: Drugging KRAS	
11-Dec	*Final exam review* (TA only)	
TBD	**Final Exam, location TBD**	

QUIZ AND EXAM SCHEDULE

Evaluation	**Coverage**	**Date**
Quiz 1	Modules 2-3	9/11
Quiz 2	Modules 3-5	9/25
Quiz 3	Modules 6-7	10/9
Midterm	Modules 2-8	10/23
Quiz 4	Modules 8-9*	11/6
Quiz 5	Modules 10	11/18
Quiz 6	Modules 11-12	12/4
Final exam	Modules 1-14; focus on 9 - 14	Exam Week

**Material from some modules will be included in more than one quiz. Quizzes will be completed in lecture. Midterm and final exams will be conducted in-person with details provided closer to the date.*
Quiz dates may change depending on the pace of lectures.

HOMEWORK SCHEDULE

Evaluation	**Coverage**	**Date**
1	How big is that?	9/2
2	Back of the envelope calculations	9/9
3	Diagramming PKU	9/30
4	Translation and mutations	10/16
5	Two letter genetic code	11/13
6	Enzyme kinetics	12/2

Homework dates may change depending on the pace of lectures. Homework assignments are due at midnight on the day listed here or posted in Brightspace.