PURDUE
UNIVERSITY

DEPARTMENT OF BIOCHEMISTRY

BCHM 60200-001 Syllabus
Critical Thinking and Communication in Biochemistry II
CRN: 40763
Spring, 2026
2 Cr

INSTRUCTIONAL MODALITY

Face-to-Face.

LECTURE

All lectures will be recorded, and will be available for students who miss a class or who would like to review a lecture. They can be downloaded at
http://www.itap.purdue.edu/learning/tools/boilercast/

COURSE OBJECTIVES

In this course, we will explore components of experimental design and research projects that help make experiments interpretable, informative, innovative and interesting.
We will discuss aspects of critical thinking in relation to reading scientific papers, designing of a research study and interpreting experiments. We will cover components of grant applications, identification of and justification for research questions, strategies for designing grant (or prelim) applications, tips for writing accurately, clearly and convincingly. This course will draw from examples in primary literature plus federal, institutional, internal and external sources.

LEARNING OUTCOMES

Demonstrate proficiency in basic writing skills by applying appropriate and correct organization, structure, formatting, grammar, spelling and citation to scientific writing.

Demonstrate proficiency in scientific writing by demonstrating the ability think critically and to convey ideas clearly, concisely and convincingly.

Demonstrate an understanding that the best scientific writing and grant writing will include your scientific community and will require multiple drafts, collaboration, feedback, and reflection.

Demonstrate proficiency in scientific oral communication by demonstrating the ability to think critically and to convey ideas clearly, concisely and convincingly.

LEARNING RESOURCES, TECHNOLOGY AND TESTS

TEXTBOOK

No textbook is assigned for this course.

Brightspace learning management system
Access the course via Purdue's Brightspace learning management system. Begin with the Start

Here tab, which offers further insight to the course and how you can be successful in it. It is strongly suggested that you explore and become familiar not only with the site navigation, but also with content and resources available for this course. See the Student Services widget on the campus homepage for resources such as Technology Help, Academic Help, Campus Resources, and Protect Purdue.

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

ASSESSMENT

Assessment of student performance will occur through monitoring participation, group discussions, quality of presentations and performance on assignments.

Turn in writing assignments using the following Documents name format:

Author_Section_Version e.g. Smith_Approach_v1.doc

Participation

Students are responsible for reading material prior to class. Participation requires being FULLY engaged in the discussions and includes making comments, asking relevant questions, etc.

Presentations

Students will have opportunities to present to the class.

NOTE: Make sure that you have read assignments ahead of time for each class so that you are FULLY engaged in the discussions.

The grading for this course will be as follows:
Presentations   75 points
Homework   430 points

The cutoff values for letter grades are as follows:
455 points   A
404 points   B
354 points   C
303 points   D
302 points and below   F

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

The final date to withdraw from the course with a W for Spring 2026 is Thursday, April 16. Each student will have graded feedback before Thurs., April 16 and before Mon. April 27.

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

Late Work Policy

Manage your time wisely. Assignments are due by **the designated time** on the specified due date (Thursdays: upload to Brightspace or Mondays: upload to Brightspace). **Late assignments**

will not receive full credit. Turning in any assignment late will automatically result in 5 points being deducted from that assignment. Missing an assignment will result in a grade of 0 being recorded unless documented justification for the absence is presented (doctor's note, request from academic advisor, etc.). Many assignments involve peer review in which your classmate either needs feedback from you on their writing (or needs your draft in order to complete their peer reviewer assignment) on due date in order to complete their next assignment on time.

Artificial Intelligence Language Models

NSF's and NIH's Policies on the use of artificial intelligence technologies for Peer Review is that it is <u>forbidden</u>. Students may use artificial intelligence (AI) language models, such as ChatGPT, as a starting point for gaining background information ONLY. However, students must read the primary literature, accurately interpret and describe findings (and the experiments that led to those findings), accurately cite original sources while writing, and be able to describe and defend orally any statement they make in written assignments based on published data (or the lack thereof) and alternate interpretations of that data. *Students are NOT permitted to use artificial intelligence (AI) language models, such as ChatGPT, for their writing assignments or to review peers' writing assignments for this course.* Students who use AI in writing assignments and presentations will be deemed to be in violation of the academic integrity expectations for this course. Violations can include a failing grade on the assignment in question and/or a failing grade for the course. All suspected incidents of academic dishonesty will also be referred to the Office of Student Rights and Responsibilities for further review of the student's status with the University.

EXTRA CREDIT

There will be no opportunity for extra credit.

OBTAINING EXTRA HELP

The professor or the TA will be available to answer your questions immediately after class, or by appointment (arranged in class or by e-mail).

PURDUE HONORS PLDGE

> As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together – we are Purdue.

https://www.purdue.edu/provost/teachinglearning/honor-pledge.html

CLASS ATTENDANCE

This course follows the University Academic Regulations regarding class attendance, which state that students are expected to be present for every meeting of the classes in which they are enrolled. Attendance will be taken at the beginning of each class and lateness will be noted. When conflicts or absences can be anticipated, such as for many University-sponsored activities and religious observations, you should inform me of the situation as far in advance as possible. For unanticipated or emergency absences when advance notification to is not possible, contact me as soon as possible by email or phone. For absences that do not fall under excused absence regulations (see below), this course follows the following procedures:

1. Do not come to class if you are feeling ill, but DO email me at xxx@purdue.edu, with the subject line: xxx [course code] absence. I do not need details about your symptoms. Just let me know you are feeling ill and cannot come to class. If it is an emergency situation,

please follow the University regulations on emergent medical care (see below).

2. Unless it falls under the University excused absence regulations (see below), any work due should be submitted on time via our course Brightspace.
3. If that day's class involves assessed work such as a test or presentation, you and I will plan if and how you can make up the work, following the assignment guidelines. This plan must be done before the next class period, so again, email me immediately when you know that you will miss class.
4. The most important consideration in any absence is how it will affect your achievement of the assignment objectives and the course learning outcomes.

For cases that fall under **excused absence regulations**, you or your representative should contact or go to the Office of the Dean of Students (ODOS) website to complete appropriate forms for instructor notification. Under academic regulations, excused absences may be granted by ODOS for cases of grief/bereavement, military service, jury duty, parenting leave, or emergent medical care. The processes are detailed, so plan ahead.

PROTECT PURDUE

Any student who has substantial reason to believe that another person is threatening the safety of others by not complying with Protect Purdue protocols is encouraged to report the behavior to and discuss the 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 and the Violent Behavior Policy under University Resources in Brightspace.

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

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 integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern. More details are available on our course Brightspace under University Policies and Statements.

NOTICE OF COPYRIGHT PROTECTION OF COURSE MATERIALS

See the University Policies and Statements section of Brightspace for guidance on Use of Copyrighted Materials. Effective learning environments provide opportunities for students to reflect, explore new ideas, post opinions openly, and have the freedom to change those opinions over time. Students and instructors are the authors of the works they create in the learning environment. As authors, they own the copyright in their works subject only to the university's right to use those works for educational purposes Students may not copy, reproduce, or post to any other outlet (e.g., YouTube, Facebook, or other open media sources or websites) any work in which they are not the sole or joint author or have not obtained the permission of the author(s).

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.

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). To this end, Purdue has transitioned to online course evaluations. On Monday of the fifteenth 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 is committed to maintaining a community that 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 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. A hyperlink to Purdue's full Nondiscrimination Policy Statement is included in our course Brightspace under University Policies and Statements.

MENTAL HEALTH

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try WellTrack**.** Sign in and find information and tools at your fingertips, available to you at any time.

If you need support and information about options and resources, please contact or see the Office of the Dean of Students. Call 765-494-1747. Hours of operation are M-F, 8 a.m.- 5 p.m.

If you find yourself struggling to find a healthy balance between academics, social life, stress, etc., sign up for free one-on-one virtual or in-person sessions with a Purdue Wellness Coach at RecWell. Sign up is free and can be done on BoilerConnect. Students in Indianapolis will find support services curated on the Vice Provost for Student Life website.

If you're struggling and need mental health services: 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 mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS offices in

West Lafayette or Indianapolis.

BASIC NEEDS SECURITY

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday.

ACCESSIBILITY AND ACCOMODATIONS

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 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 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.

A link to Purdue's Information on Emergency Preparation and Planning is located on our Brightspace under "University Policies and Statements." This website covers topics such as Severe Weather Guidance, Emergency Plans, and a place to sign up for the Emergency Warning Notification System. I encourage you to download and review the *Emergency Preparedness for Classrooms document (PDF) or (Word).*

We will review the **Emergency Preparedness plan for our specific classroom**, following Purdue's required Emergency Preparedness Briefing. Please make note of items like:

- The location to where to proceed after evacuating the building if we hear a fire alarm.
- The location of Shelter in Place in the event of a tornado warning.
- The location of Shelter in Place in the event of an active threat such as a shooting.

DISCLAIMER

This syllabus is subject to change.

(Approximate) LECTURE SCHEDULE

Topic
Introduction. Designing Experiments that Are Interpretable and Informative. Course Overview, Controls, Correlation.
Hypotheses. Designing Studies that Are Interpretable, Informative and Interesting. Necessity, Sufficiency.
Categories of Experiments Grant Writing Overview, Project Summary, NIH Abstracts
Homework I Due 9 AM: Proposal Topic, List Aims, subAims
NO CLASS
Peer Reviewing, Identifying and Addressing Important Questions: Grant Writing Overview, Specific Aims
Identifying and Addressing Important Questions: Significance Innovation
Homework II Due 9 AM: Draft Specific Aims
Homework III Due 9 AM: Peer Review of Specific Aims
Discuss Draft Aims; Research Strategy, Approach
Homework V Due 9 AM: Draft Significance and Innovation
Homework IV Due 9 AM: Revised Specific Aims
Homework VI Due 9 AM: Peer Review of Significance and Innovation
Discuss Draft Significance and Innovation; Research Strategy, Approach
Homework VII Due 9 AM: Revised Significance and Innovation
Expressing Ideas Clearly & Convincingly: Reading & Writing, Proposal Reviewing
Homework VIII Due 9 AM: Draft Approach
Homework IX Due 9 AM: Peer Review of Approach
NO CLASS-SPRING BREAK
Discuss Draft Approach; Expressing Ideas Clearly & Convincingly: Reading & Writing
Giving Credit Where Credit Is Due: Original Work, Citing Sources, Plagiarism Applying for Fellowships, Personal Statements for Fellowships, Biosketches
Homework X Due 9 AM: Draft Abstract/Project Summary
Homework XI Due 9 AM: Peer Review of Abstract/Project Summary
One on one meetings (4/6 or 4/7)
Homework XII Due 9 AM: Final Proposal (give to Peer Reviewers on Review Panel)
Mock Panel Orientation **Presentation4/21: 6 min. In Class Presentations = Graduate Student Fellowship & Grant Opportunities**
Homework XIII Due 9 AM: Peer Reviewer Comments (give to Review Panel)
Presentation: In Class Mock Review Panel
Grad Student Panel
Homework XIV Due 9AM: Responses to Peer Reviews

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EMERGENCY PREPAREDNESS SYLLABUS ATTACHMENT
EMERGENCY CALL 911

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EMERGENCY NOTIFICATION PROCEDURES are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.

- **Indoor Fire Alarms** mean to stop class or research and <u>immediately</u> **evacuate** the building.
- Proceed to your Emergency Assembly Area away from building doors. **Remain outside** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.
- **All Hazards Outdoor Emergency Warning Sirens** mean to <u>immediately</u> seek shelter (**Shelter in Place**) in a safe location within the closest building.
    - "Shelter in place" means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, an active threat including a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency*. **Remain in place** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

In both cases, you should seek additional clarifying information by all means possible…Purdue Emergency Status page, text message, Twitter, Desktop Alert, Albertus Beacon, digital signs, email alert, TV, radio, etc.…

EMERGENCY RESPONSE PROCEDURES:
- Review the **Emergency Procedures Guidelines** https://www.purdue.edu/emergency_preparedness/flipchart/index.html
- Review the **Building Emergency Plan** (available on the Emergency Preparedness website or from the building deputy) for:
    - evacuation routes, exit points, and emergency assembly area
    - when and how to evacuate the building.
    - shelter in place procedures and locations

    - additional building specific procedures and requirements.

MORE INFORMATION
Reference the Emergency Preparedness web site for additional information:
https://www.purdue.edu/ehps/emergency_preparedness/

Emergency preparedness is your personal responsibility. Purdue University is actively preparing for natural disasters or human-caused incidents with the ultimate goal of maintaining a safe and secure campus. Let's review the following procedures:

- For any emergency call 911.

- There are nearly 300 Emergency Telephone Systems throughout campus that connect directly to the Purdue Police Department (PUPD). If you feel threatened or need help, push the button and you will be connected to the PUPD.

- If we hear a fire alarm we will immediately evacuate the building and proceed to lawn south of BCHM.

    - **Do not use the elevator.**

    - Go over evacuation route…see specific Building Emergency Plan.

- If we are notified of a Shelter in Place requirement for a tornado <u>warning</u> we will shelter in the lowest level of this building away from windows and doors.

- If we are notified of a Shelter in Place requirement for a hazardous materials release we will shelter in our classroom shutting any open doors and windows.

- If we are notified of a Shelter in Place requirement for an active threat such as a shooting we will shelter in a room that is securable preferably without windows. Our preferred location is __Classroom__.