

Biochemistry II CHE 4320

Spring 2015

Mon & Wed 8am-9:15am Room: SI 3081

Course Website: <http://bonhamchemistry.com>

Instructor: Dr. Andrew J. Bonham

Contact: abonham@msudenver.edu

Office Hours: M & W 10:00-12:00, Th 1:00-2:00

Office: SI 3048

What is the objective of this course?

In this course, you will learn how to think and work as a professional biochemist. To do so, we will be examining a broad variety of biochemical topics (see below). But more importantly, we will be utilizing primary literature, group discussion, research critiques, and invited speakers to provide a learning environment reminiscent of the graduate school experience and the world of professional research biochemistry.

What format will the class take?

Our advanced approach to learning biochemistry only works if all of the students take ownership of the class, approaching it in a dedicated and professional manner. The ideal format for this course is a **seminar**: an open discussion where instructional responsibilities are shared equally among all participants. Since most students at this level have had little experience with seminar-style courses, the format of this course will be a compromise. At the beginning of the semester, I will present lectures and guide discussion formally. As the semester progresses, I encourage and expect all of you to move toward individual participation and course guidance. I will continue to act as a troubleshooter, guide, and resource-of-last-resort, but will expect different students to take the role of seminar leader for different topics. By the end of the course, our time will consist entirely of student presentations and student-led discussions. This is a great chance to learn how to be a professional scientist!

How will I participate?

There are many ways you will be called upon to participate in this course. Science is, by its nature, a social activity-- knowledge is only gained by collaboration and sharing the fruits of our research. Some examples of activities that you may choose to do for this course:

- Giving a mini-lecture (5-15 minutes) on a topic that you research for the course
- Guiding a discussion / critique of a paper that we have read as a class as seminar leader
- Presenting the answer to a question previously raised in class
- Giving a brief summary and critique on a book reviewed for class
- And, of course, active participation in class discussions

What can you expect from the instructor?

I will give clear, relevant, on-time lectures and encourage class participation. I will provide clear assignments, as well as clear and fair grading policies as outlined in this syllabus. I will offer reasonable availability outside of class (e.g., office hours). Through my actions, I will encourage your understanding and enjoyment of the science of biochemistry.

Materials / Reading:

- Lehninger Principles of Biochemistry, 6th ed. Nelson, D.M. and Cox, M.M. This book is available at the Auraria Bookstore, but may be available elsewhere (such as online) more affordably. This book is a good, informative, and even fun read, but is **NOT required**.
- Much of the course material will be primary literature research articles and class notes distributed by Dr. Bonham throughout the semester.

Class Participation:

Regular attendance and involvement in the classroom learning process is absolutely essential for a discussion-based course. **Three or more unexcused absences will result in a failing grade for this course.** Excused absences include documented illness, injury or death of family and close friends, and other reasons of high import. If in doubt, contact the instructor as early as possible.

Course Topics:

This course will draw from a wide range of topics and may include (but is not limited to) the following topics:

- enzyme kinetics and mechanism discovery
- membrane proteins and ion channels
- neurochemistry
- DNA recombination
- protein synthesis
- regulation of gene expression
- DNA biotechnology
- biosynthetic pathways and regulation
- immunology
- bio-nanotechnology
- signal transduction pathways
- genetic engineering
- molecular biology
- biochemistry of nutrition
- cancer and other disease risks

The first topic discussed in class will be Enzyme Kinetics & Mechanism Discovery. The remaining topics and their order of presentation will be decided upon collaboratively as the semester progresses.

Assignments and Grading:

This class will be graded via a Final Exam, as well as several assignments, some of which are required by everyone, and some of which you will choose among. You will choose assignments to improve your grade in a cumulative fashion. At the end of the course, your points will be totaled, with 100 to 90 points being an A, 89 to 80 points being a B, and so on. Points are tentative and subject to change at instructor discretion.

<u>Required Assignments</u>	<u>Available Points</u>
Final Exam	15 points
First article critique	10 points
Second article critique	10 points
Term Paper	20 points
Presentation	15 points
Class participation	5 points

<u>Choose-Your-Own Assignments</u>	<u>Available Points</u>
Discussion Leadership	5 points
Additional article critique (each)	10 points
Book review and brief discussion (ea)	10 points
Mini review paper and brief discussion (each)	5 points

A few examples:

- A student who typically works hard and receives ~90% scores on exams and assignments receives the following points from the required components: Final Exam 13.5 points (90% of a possible 15), first article critique 9 points, second article critique 9 points, term paper 18 points, presentation 13.5 points, class participation 5 points. That's a total of 68 points, which would give a high D in the course. So, this student additionally leads a good discussion for 5 points, does an additional article critique for 9 points, and does two mini review papers on topics they find interesting for a total of 9 points. This gives a final point total of 91 points, or an A.
- Another student takes the course out without much dedication, and receives 5 points on the first article critique, 5 points on the second article critique, 13 points on the term paper, and 10 points on their presentation. They get 2 points for class participation, and realize towards the later half of the term that their grade is in bad shape- they have only 35 points! They study hard and get to work, eventually getting 14 points on the final exam, and read two interesting scientific books and writes good reviews for a total of 17 points, they also do two more decent article critiques which net them another 13 points. They end the course with 79 points, for a high C. They could have received a B with just a little more effort!
- Another student has a heavy course load this semester, and although a very bright individual, coasts through the class doing the minimum work required. They get 14 points on the final exam, 9 points on the first and second article critique, 18 points on the term paper, but only 9 points on the presentation (since they weren't very engaged), and similarly only 2 points of class participation. That's 52 points, a failing grade. They need to do some additional assignments to pass the course!

Grades will generally be available at the next regularly-scheduled course meeting. For Finals, final grades will be available from me in person on Friday of finals week. Grades will be available by web and kiosk on Friday, May 23rd at <http://connectu.msudenver.edu>.

FERPA policies prohibit me from releasing your grades via phone or email unless you register with the Registrar's office and obtain a non-identifying security code.

Drop Dates:

Students will be expected to know and observe the MSU Denver regulations regarding class drop dates and No-Credit Withdrawal (NC). It is the student's responsibility to withdraw from a course. See <http://www.msudenver.edu/MetroCal/tools/acal.jsp>

Academic Dishonesty:

Academic dishonesty is a serious offense. Any occurrence diminishes the quality of scholarship and the learning experience for everyone on campus. An act of Academic Dishonesty will lead to sanctions including a reduction in grade (up to and including a permanent F for the course), probation, suspension, or expulsion. Academic dishonesty includes cheating, fabrication, plagiarism, submitting the same paper or work for more than one class, and facilitating academic dishonesty. For definitions and more information, see the Student Handbook which is available online through ConnectU.

Disability Accommodation, Discrimination Policy, and Class Attendance on Religious Holidays:

The Metropolitan State University of Denver is committed to making reasonable accommodations to assist individuals with disabilities in reaching their academic potential. If you have a disability, which may impact your performance, attendance, or grades in this class and are requesting accommodations, then you must first register with the Access Center, located in the Auraria Library, Suite 116, 303-556-8387. I cannot provide accommodations prior to my receipt of a faculty notification letter from the Access Center. Please note that accommodations are never provided retroactively (i.e., prior to the receipt of your faculty notification letter.) Once I receive your official Access Center faculty notification letter, I would be happy to meet with you to discuss your accommodations. All discussions will remain confidential. More information is available by visiting the Access center website <http://www.msudenver.edu/access/>

The Metropolitan State University of Denver does not discriminate on the basis of race, color, creed, national origin, sex, age, sexual orientation or disability in admission or access to, or treatment in, its educational programs or activities. Inquiries concerning Title VI, Title IX and Section 504 may be referred to Dr. Percy Morehouse, Director, Equal Opportunity, Metropolitan State College of Denver, 303.556.2939; or to the Office for Civil Rights, U.S. Department of Education, 1244 Speer Boulevard, Suite 300, Denver, CO 80204. Discrimination based on disability in admission to, access to or operation of programs, services or activities of the college is prohibited by the Americans with Disabilities Act.

Students at Metropolitan State University of Denver (MSU Denver) who, because of their sincerely held religious beliefs, are unable to attend classes, take examinations, participate in graded activities or submit graded assignments on particular days shall without penalty be excused from such classes and be given a meaningful opportunity to make up such examinations and graded activities or assignments provided that advance written notice that the student will be absent for religious reasons is given to the faculty members during the first two weeks of the semester.

Nothing in paragraph one of this policy shall require MSU Denver faculty members to reschedule classes, repeat lectures or other ungraded activities or provide ungraded individualized instruction solely for the benefit of students who, for religious reasons, are unable to attend regularly scheduled classes or activities. However, presentations, critiques, conferences and similar activities involving individual students shall be scheduled to avoid conflicts with such students' religious observances or holidays provided that reasonable advance notice of scheduling conflicts is given to faculty members. Because classroom attendance and participation is an important aspect of learning, MSU Denver students should not register for courses if regularly scheduled classes or activities routinely conflict with their religious observances or holidays (e.g., conflicts resulting in weekly absences for an entire semester). Any MSU Denver student who believes that an MSU Denver faculty member has violated this policy is entitled to seek relief under Section V of the MSU Denver Equal Opportunity Grievance Procedure.

Syllabus Changes and Policy:

Any changes in this syllabus I may deem necessary during the semester will be announced in class and made available in writing. I reserve the right to revise the syllabus and grading policies at any time.

Week	Date	Topics & Deadlines
1	Jan 21 st	<ul style="list-style-type: none"> • Introduction & what makes a discussion group? • Phosphates
2	Jan 26 th & Jan 28 th	<ul style="list-style-type: none"> • Enzyme Kinetics • Article Critique Discussion & Planning
3	Feb 2 nd & Feb 4 th	<ul style="list-style-type: none"> • Reading research outside your field • Protein Engineering • Mini-Presentations begin • Article Critique 1 due Feb 4th at start of class
4	Feb 9 th & Feb 11 th	<ul style="list-style-type: none"> • SELEX and RNAzymes • The Art of Writing Science
5	Feb 16 th & Feb 18 th	<ul style="list-style-type: none"> • Neurochemistry • Peer review session on Feb 18th • Article Critique 2 due Feb 18th at start of class
6	Feb 23 rd & Feb 25 th	<ul style="list-style-type: none"> • Neurochemistry • Addiction • First draft of Term Paper due Feb 25th at start of class
7	March 2 nd & March 4 th	<ul style="list-style-type: none"> • Communicating and reading lay-science • Nutrition
8	March 9 th & March 11 th	<ul style="list-style-type: none"> • Nutrition
9	March 16 th & March 18 th	<ul style="list-style-type: none"> • Topic TBA • How to present research
Spring Break	March 23 rd – March 27 th	---
10	March 30 th & April 1 st	<ul style="list-style-type: none"> • Topic TBA
11	April 6 th & April 8 th	<ul style="list-style-type: none"> • Topic TBA
12	April 13 th & April 15 th	<ul style="list-style-type: none"> • Topic TBA • Final deadline for Article Critiques & book Reviews April 15th at start of class
13	April 20 th & April 22 nd	<ul style="list-style-type: none"> • Review for ACS Biochemistry • Final Presentations
14	April 27 th & April 29 th	<ul style="list-style-type: none"> • Final Term Paper due April 29th at start of class • Final Presentations
15	May 4 th & May 6 th	<ul style="list-style-type: none"> • Final Presentations
FINAL	TBA during May 11 th – May 15 th	<ul style="list-style-type: none"> • ACS Biochemistry Final