

SYLLABUS
CHEM-405 Biochemistry I
Dr. Jeff Osborne

COURSE OBJECTIVE

This course aims to familiarize you with the structure, function, and interaction of proteins and nucleic acids and some important metabolic cycles, as well as to develop a molecular view of chemistry in living organisms, to prepare you for further study.

OFFICE HOURS

My office is room 313 Science Center. Office hours are posted outside my office, but I will be available any time my door is open and I am not busy. I will try to respond to your questions or course related difficulties within 24 hours, either by email or by addressing them in class. My email is jposborne@manchester.edu.

TEACHING METHODS

Class sessions will be mostly lecture with a few guided inquiry and case studies worked on in small groups. Projects outside of class include macromolecular modeling assignments and a major research paper. I believe that a variety of teaching methods that challenge you to actively learn in a variety of ways, interact socially, cooperate with peers, and think independently will best achieve the Course Objective described above. Additional readings and online activities from various other informative web sites will be assigned as the class progresses.

EXPECTATIONS OF STUDENTS

Students of biochemistry need to learn to examine and process information, devise relevant questions, and construct their own understanding of diverse topics. The content of the course will be presented during the lecture time and you will be responsible for everything that is presented during that time, unless it is explicitly excluded. The textbook is a resource, but does not determine nor contain the full content of the course, as biochemistry is one of the most rapidly changing fields of science. You are expected to complete reading assignments *prior* to their corresponding lecture. Activities will often require something to be completed and turned in on a 3×5 index card during class. You are expected to master specific skills for each exam. Missed quizzes, presentations, or exams cannot be made up except under very special, documented conditions described below under the heading "Makeup Tests" in Course Policies.

WHAT STUDENTS CAN EXPECT FROM THE TEACHER

I will create opportunities for your learning in a number of ways and then provide constructive criticism in a welcoming and respectful environment. I bring enthusiasm and expertise in the subject area, yet require you to understand and wrestle with the ideas presented, so that you are able to arrive ultimately at your own conclusions. I welcome ideas and suggestions, with the goal of improving the course. Toward this end, student feedback will be requested a number of times during the course. I strive to practice what I preach as a scientist who is continually learning.

CLASS WEBSITE

The class web site on Canvas will be updated frequently, and will include your daily readings, main ideas, skills to master, and homework assignments. By the prior night, each lecture will be posted as a PDF file that can be printed out with multiple slides per page using the Page Scaling feature in Adobe Acrobat Reader.

REQUIRED MATERIALS

You will need Biochemistry, 8th edition, by Berg, Tymoczko, Gatto, and Stryer (2015). ISBN: 1464126100. Biochemistry is changing much more rapidly than other parts of chemistry, so a current textbook is essential.

3×5 index cards will be required for daily quizzes or short writings. **Bring 3×5 index cards, as answers will only be accepted on 3×5 index cards.** Note that 3×5 index cards are *free* outside Room 209 in the Success Center in the Student Union.

“W” COURSE STATUS

This course serves as the writing course requirement for the Biology-Chemistry Major. There will be a major paper as well as other writing/analysis assignments.

PORTFOLIO

If you are a chemistry major, you will need to assemble a portfolio of your work in your senior year that covers all four years of coursework. The enzyme paper, as well as other protein modeling assignments, should be included as examples of your writing ability for this portfolio.

COURSE POLICIES

Class Participation. All students are expected to participate in class exercises. I can help you learn, but the responsibility is yours.

Makeup Tests. Makeup tests and quizzes will only be given for students who missed them due to verifiable illness, religious holiday, serious family emergency, jury duty or court subpoena. Missing an exam or quiz without an excuse from the college nurse, a doctor, or Student Development is not permitted.

Academic Dishonesty. Cheating and plagiarism in the form of taking credit for someone else's work, thoughts, or conclusions without giving that individual proper credit will not be tolerated. Some other examples of cheating include using notes or looking at a classmate's paper during a quiz or exam, copying portions of someone else's work in your enzyme paper, or using the published ideas of another person without assigning credit to them by using a reference. For more specific information concerning the consequences of cheating and plagiarism, read the college catalog on "Plagiarism" and "Academic Dishonesty." Also, the "Academic Dishonesty and Grievance" document on Canvas has more details.

Diversity. To maintain a welcoming and respectful classroom environment, disrespect of other students, in the form of verbal or written threats, attacks, or insults on the basis of gender, race, physical disability, physical stature, culture, socio-economic class, creed, sexual preference, mental disability or any form of social group membership will not be tolerated.

Student Disability and Reasonable Accommodation Statement. Manchester University, in compliance with federal guidelines, is committed to assuring students with disabilities equal access to programs and activities that are provided to students without disabilities.

Any student who feels she or he may need an accommodation based on the impact of a disability should contact Audrey Hampshire, the Director of Academic Support and Disability Services, to establish eligibility and to coordinate reasonable accommodations. It is the student's responsibility to self-disclose the disability. Students whose accommodation requests are approved will be provided with confidential letters to deliver to their professors which verify the nature of the student's disability and document the need for auxiliary aids and services and/or academic adjustments/accommodations. Students are encouraged to meet with each professor early in the semester to discuss the academic implications of the disability as they relate to the specific course and to request appropriate accommodations. The Disability Support Services Office is located in the Success Center (second floor of the Switzer Center). Students may call (260) 982-5036 or (260) 982-5888 to schedule an appointment.

Medical Emergency Evacuation Schedule. Students should speak to the instructor immediately if (1) they may require medical attention during class, or (2) they have a disability, chronic condition, or a temporary injury that may limit or affect their ability to evacuate the classroom/building in an emergency. The student and the instructor should discuss the student's specific needs and the types of precautions that should be made in advance of such an event. In the event of a fire or other situation requiring emergency evacuation, students with ambulatory disabilities are to go with or without assistance to the nearest stairwell area. Faculty and staff will assist with evacuation

management efforts until such time as the Campus Safety and/or Police and Fire Departments arrive on the scene to assist in student evacuation from the building. Elevators are not to be used for evacuation by any persons.

Students who need special arrangements in the event of an evacuation should also register with Audrey Hampshire as early as possible in the semester to help facilitate the provision of needed emergency assistance.

Diversity. Disrespect of other students in the form of verbal or written threats, attacks, or insults on the basis of gender, race, physical disability, physical stature, culture, socio-economic class, creed, sexual preference, mental disability or any form of social group membership will not be tolerated.

Title IX reporting requirements. While students should feel comfortable approaching the professor with issues they may be struggling with or concerns they may be having, students should be aware that faculty members have some reporting requirements that are part of their job duties at Manchester University.

For example, if a student informs a faculty member of an issue of sexual harassment, sexual assault, or discrimination, the faculty member will keep the information as private as possible, but the faculty member is required to bring it to the attention of the institution's Title IX Coordinator (x. 5052 ajmachielson@manchester.edu) or the Human Resources office (ext. 5038). Additionally, students can report incidents or complaints to Campus Safety (ext. 5999 or in Fort Wayne: 260-266-1800). Students can also obtain support from the University Counseling Services (260-982-5306).

Finally, students should know that if, for some reason, the interaction between a student and faculty member involves a disruptive behavior or potential violation of policy, the faculty member will inform the appropriate student experience staff, even when the student and faculty member may have reached an informal resolution to the incident. The purpose of this is to keep University leaders apprised of any behaviors and what was done to resolve them.

Campus resources.

Health Services

260-982-5306

<http://www.manchester.edu/OSD/Health/Index.htm>

Counseling Center

260-982-5306

<http://www.manchester.edu/OSD/Counseling/Index.htm>

Safety

NM: 260-982-5999; FW: 260-266-1800

<http://www.manchester.edu/OSD/Security/index.shtml>

HOMEWORK PROBLEMS

Problems from a lecture topic will be due at the beginning of the class period that follows the one in which that lecture topic was completed. Each question will be worth one point and must be answered thoroughly in order to gain the full points. There will be a penalty of one point per day for late or incomplete problem sets. *Write your name, the due date, and the assignment title on your homework.*

GRADING

Grades are based on results, not effort, although more effort usually will improve your grade. My grading philosophy is that using a variety of methods to evaluate your progress is more fair and appropriate than relying only on a few large exams. Additionally, spreading out tests and assignments over the semester encourages you to keep up with the course material and provides many opportunities to succeed in this class. Grades will be determined by the percentage of total possible points earned, as shown in the box to the right. An estimate of the final point total is below. Additional assignments may be given that would alter the total, but the percentage for each letter grade is absolute. An estimate of the possible points follows:

A	93%	4.0
A-	90%	3.7
B+	87%	3.3
B	83%	3.0
B-	80%	2.7
C+	77%	2.3
C	73%	2.0
C-	70%	1.7
D+	67%	1.3
D	63%	1.0
D-	60%	0.7

Item		Points
Daily Problems (1 pt. each)	25 @ ~ 2	50
Daily Quizzes	24 @ 2	48
Introductory Writing Assignment	1 @ 25	25
Macromolecular Modeling Project	1 @ 40	40
Enzyme Paper Project	1 @ 160	160
Exams	5 @ 100	500
TOTAL		823

Class	Date	Topic	Reading (Chapter.section)	Other
1	31 Aug	Water and Buffers	1	
2	2 Sep	Lipids and Membranes	12	
3	5 Sep	Lipids and Membranes		Personal Essay Assignment Due
4	7 Sep	Amino Acids and 1° Protein Structure	2.1-2.2, 6.1-6.3	
5	9 Sep	2°, 3°, and 4° Protein Structure	2.3-2.6	Personal Essay Peer Reviews Due
6	12 Sep	2°, 3°, and 4° Protein Structure		Personal Essay Resubmissions Due
7	14 Sep	Working with Proteins	3	
8	16 Sep	Enzyme Thermodynamics	8.1-8.3	
9	19 Sep			EXAM 1
10	21 Sep	Enzyme Kinetics	8.4	
11	23 Sep	Enzyme Inhibition	8.5	Enzyme Selection Due (see Macromolec. Model. Assign. 1 on Canvas)
12	26 Sep	Enzyme Mechanisms	9.1-9.2	
13	28 Sep	Enzyme Mechanisms		
14	30 Sep	Enzyme Regulation and Drug Development	10.1, 36.1-36.2	
15	3 Oct	Myoglobin and Hemoglobin	7	Macromolec. Model. Assign. 1 Due
16	5 Oct	Myoglobin and Hemoglobin		SciFinder Account
17	7 Oct	Metabolism Overview	15	

18	10 Oct	Fatty Acid Catabolism	22.2-22.3	
19	12 Oct	TCA Cycle	17.2-17.4	
20	14 Oct	Membrane Transport	13	EXAM 2
	17 Oct	Fall Break		
21	19 Oct	Electron Transport Chain	18.1-18.3	
22	21 Oct	ATP Synthase	18.4-18.6	
23	24 Oct	Sugars and Glycolysis	11.1-11.2, 16.1-16.2, 17.1	<i>Enzyme Paper Bibliography Due</i>
24	26 Oct	Sugars and Glycolysis		
25	28 Oct	Gluconeogenesis	16.3-16.4	
26	31 Oct	Gluconeogenesis		
27	2 Nov	Pentose Phosphate Pathway	20.3-20.5	
28	4-Nov	Pentose Phosphate Pathway		
29	7 Nov			EXAM 3
30	9 Nov	DNA Structure	4.1-4.3	
31	11 Nov	DNA Replication	28.1-28.3 and watch Mechanism of DNA Replication (Advanced) at http://www.youtube.com/watch?v=I9ArIJWYZHI	<i>Enzyme Paper Rough Draft and Self-Eval Due</i>
32	14 Nov	DNA Replication		
33	16 Nov	RNA Structure	4.4	<i>Enzyme Peer Reviews Due</i>
34	18 Nov	RNA Synthesis and Splicing	29.1-29.4	
35	21 Nov	Translating Genetic Code	30.1-30.2	
	23 Nov	Thanksgiving Break		
	25 Nov	Thanksgiving Break		
36	28 Nov	Protein Synthesis Process	30.3-30.5	<i>Enzyme Paper and Self-Eval Due. Sign up for presentation times.</i>
37	30 Nov	Case Study		
38	2 Dec			EXAM 4
38	5 Dec	Enzyme Presentations		
39	7 Dec	Enzyme Presentations		
40	9 Dec	Enzyme Presentations		
	12 Dec	Reading Day		
	13-16 Dec			Final Exams