

Biochemistry: Membranes and Metabolism
CHEM 3812
Spring Qtr 2021

Asst. Prof. John Latham

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Meeting time and location: MWF 10:00 - 10:50 am, Final Exam: TBD

Office and office hours: SGM 251, by appointment – if needed, I will provide fixed office hours

Course Description: This course will discuss the evolution of the structure and function of biological molecules such as lipids, carbohydrates, and lipid-bound proteins. In addition, this course address important concepts including bioenergetics and metabolic pathways. Students will be required to read and evaluate primary literature relevant to the course.

Course Goals: By the end of this course students should be able to:

- Know central metabolic and select secondary metabolic processes
- Understand basic bioenergetic concepts and how they influence biochemical processes
- Appreciate how evolution directed the emergence of metabolic pathways
- Understand the relationship of lipids and membrane properties
- Read scientific papers and write a scientific review

Course Objectives

Upon completion of this course, students will be able to:

- Write out the entire central metabolism scheme (structures, enzyme names, reactions) from glycolysis to ETC.
- Recall amino acid biosynthetic routes
- Distinguish between energetically favorable and unfavorable reactions
- Calculate changes in energy and membrane potential.
- Propose and write a scientific review over a metabolic process
- Critique and revise scientific reviews from peers
- Defend the concept that evolution drives the formation of metabolic processes
- Relate membrane composition to physical properties to include protein and lipid structures

Required Materials:

- Lehninger's Principles of Biochemistry (Nelson & Cox) 7th edition (optional but helpful – if you can find a 6th or 5th edition for cheap, use it instead)
- Access to DU Library eJournal database
- Access to Canvas
- Access to YouTube

COVID POLICY. No excuses will be tolerated for failure to upload exams and assignments to Canvas within the required time limits. This applies to all in class assignments, exams, and the review article.

Technology in the classroom

Students are welcome to take notes on laptops or tablets during class so long as the devices do not distract other students. If a distraction complaint by another student is issued during the quarter, students will be asked to keep their devices powered off.

Cellphone courtesy...please use it. If you are expecting an important phone call, keep the ringer on silent and answer the call outside of the classroom.

Grading

In class exercises: Reading the course material and practicing what you know is an essential part of your education. That means, if you do not read the material assigned, you are cutting your education short. Therefore, to help you stay legit about reading, short reading exercises and practice questions will be assigned at the beginning of each class.

Review article: This class will require a 3,000-word review article about any topic related to membranes or metabolic processes (75 pts). In addition, you will be responsible for the critique of two of your classmate's reviews (25 pts). The review will be written following the *Journal of Biological Chemistry* [mini-review format](#). The purpose of this review article is to provide you an opportunity to read primary literature, learn about a topic you are interested in, and write in a scientific style. A rubric will be provided for the review article and the critique. *This assignment will be conducted in groups of three.*

Exams: Four exams will be given during the quarter to assess your knowledge of the *material discussed in class, additional lecture videos, and from the assigned reading*. Each 1-hour exam will be worth 100 points. The format of the exams will be addressed one week prior to the exam itself. Although the dates of the exams are provided in the schedule below, I reserve the right to push back the exam if necessary. Headphones, earmuffs, noise cancellers, and other items at my discretion are strictly prohibited during the exam. **Failure to upload the exam to Canvas within the given timeframe will result in a 10 pt/min reduction in overall score.**

Grade Distribution

<i>Assignment</i>	<i>Points</i>
Review article (75 pts - article, 25 pts - critiques)	100
In class exercises (20 daily-ish exercises)	100
Exams (3x100 pts)	300
TOTAL	500

LECTURE AND TESTING ACCOMODATIONS. I will make every effort to accommodate students diagnosed with a learning disability. I will do this in complete confidence. I do, however, request that any student requiring these accommodations inform me the first week of class. For further information, please see the University Disability Services' website at <http://www.du.edu/disability/dsp/index.html>.

RELIGIOUS ACCOMODATIONS. It is University policy to grant students excused absences from class or other organized activities for the observance of religious holy days, unless the accommodation would create an undue hardship. I will do my best to accommodate your requests if you make arrangement with me *in advance* of your absence. Please examine the course syllabus, including the tentative schedule, for any potential conflicts with holy days and notify me prior to the end of the second week of classes of conflicts that may require your absence from class and/or prevent you from completing an assignment. More information can be found at: <http://www.du.edu/studentlife/religiouslife/about-us/policy.html>.

ACADEMIC DISHONESTY. While I advocate collaborative learning and teamwork, I also firmly believe that each individual should maintain the highest ethical standards in all of life's endeavors. As such, I support and will strictly enforce the Honor Code of the University of Denver. For your reference, the link to the Honor Code Student Conduct Policy and Procedures is: <http://www.du.edu/studentlife/studentconduct/>.

EXTRA CREDIT OPPURTUNITY. There will be several opportunities to gain extra credit during the course, such as answering questions during class. However, the biggest opportunity to gain extra points (maximum of 3 points added to your **final grade**) during the course is to create something artful about any biosynthetic pathway not discussed in the course (ie. not TCA, glycolysis, or fatty acid degradation). To gain all 3 pts, you must create something totally outstanding, something displayable. Opportunity