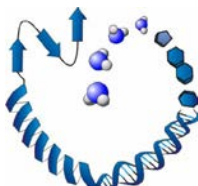


**BIOL/CHEM 328: Biochemistry II**  
**Spring Semester, 2011**  
**~ Syllabus ~**



**Instructors:**

**Lecture:** Dr. Diane Husic  
**Lab:** Dr. Steve Dunham

**E-mail addresses:**

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*Note: A separate syllabus will be provided for the laboratory segment of the course so the details in this syllabus refer only to the lecture portion of the course.*

**Dr. Husic's Office:** 311 Collier Hall of Science

**Dr. Husic's Office Hours:**

Mondays	10:00 — 11:00 am
Tuesdays	9:00 — 10:00 am
Wednesdays	10:00 — 11:00 am
Thursdays	9:00 — 10:00 am

*\* I can meet with you at other times, but please schedule these appointments with me ahead of time.*

**Class Times:**

Lecture:	Tuesdays/Thursdays 10:20 – 11:30 a.m. in PPHAC 117
Lab:	Fridays @ 1:15 - 4:15 p.m. in 209 Collier HOS

**Course Prerequisites:** BIOL/CHEM 327 (Biochemistry I); and therefore also BIOL 265 & CHEM 212 OR permission of instructor

**Course "support":** There is a Blackboard shell for this course; please check this site for announcements and updated postings on a regular basis

Website associated with textbook: <http://bcs.whfreeman.com/lehninger/>

**Course text:** Lehninger Principles of Biochemistry, 5<sup>th</sup> ed., (D.L. Nelson and M.M. Cox) W. H. Freeman & Co. (NY, 2008)



**Course objectives/introductory comments:** This course is designed to expand a student's background and understanding of the discipline of biochemistry. A variety of advanced topics will be discussed including:



Examples of key metabolic pathways and strategies



Integration and regulation of metabolism at both the organism and cellular levels



Membrane transport mechanisms



Mechanisms of catalysis and design of active sites of enzymes/enzyme kinetics



Bioenergetics



Signal transduction and the hormonal control of cellular metabolism and gene expression



Aberrations in gene expression/cellular signaling in human disease



An introduction to the biochemistry of disease (cancer, diabetes, atherosclerosis, obesity, etc.)

As time permits, I will try to incorporate discussions of topics that are currently "hot" in the field of biochemistry, relevant issues that appear in the media during the semester, and/or topics which are of particular interest to students enrolled in the course. Seeing how the concepts learned in class relate to current research in the field and understanding the social implications of the advancements in biochemistry are important. Please let me know if there are any relevant subjects that you are particularly interested in.

Approximately weekly, I will prepare a detailed lecture outline that will be posted on BlackBoard and will include a list of required and recommended readings from the text, journals or books in the library collection, or articles that can be found via the internet. In addition, I will list suggested study problems from the text. ***Please note that I will occasionally update this lecture outline throughout the week, and I use Blackboard to post announcements to the class, so you should get into the habit of checking this course resource on a regular basis.***

Since this is an upper-level course, I have high expectations for each of you. Much of the material discussed goes beyond the scope of a textbook and exams will certainly involve more than simple memorization and "regurgitation" of the material discussed in lecture. A large amount of material will be covered in this course; biochemistry has never been considered an easy subject! I will expect you to understand concepts and be able to relate them to new situations. You will also use the background material from class as a basis for interpretation and critique of current journal articles. It is my hope that this course will serve as a bridge between a classical undergraduate science course and the field of biochemistry in the "real world" of the research laboratory in industry or academe. Thus, I include readings from journals, the writing of a grant proposal, and other assignments and test questions that are designed to inspire critical scientific thinking and evaluation.

### Learning Goals:

- Students will understand key biochemical principles related to metabolism, catalysis, energetics and regulation. There are layers of complexity in biochemistry, especially in regulation.
- Students should gain an appreciation for biochemistry at the "micro-level" (molecular level) as well as how the molecular reactions and regulations enable "macro-level" processes (physiology at the cell and organism level).
- Students should understand how aberrations in a biochemical molecule or process can have major consequences for cellular function and the overall health and wellbeing of an organism.
- Students should be able to search the biochemistry literature, read primary manuscripts, and review articles critically.
- Students should be able to articulate a research question and develop a research proposal that includes a literature review, clearly articulated specific aims, and proposed experiments that address the questions being asked.



## **Biochemistry Course "Survival Techniques"**

1. *Make use of the lecture outlines to keep on track.* As noted above, I will provide an outline of topics covered in lecture each week. These outlines also include a listing of corresponding pages from the text to be read and suggested study problems.
2. *Come to class.* In an upper level course like this, I typically don't have attendance problems. I don't formally take attendance everyday, but this is a small group and I do know who shows up both physically and mentally! I don't lecture straight out of the text. If attendance ever does become a problem in one of my classes, I have been known to give *impromptu* in-class assignments due at the end of the class period; these can significantly benefit those who do show up to class.
3. *Read assigned material before coming to class.* This helps to facilitate discussions, allows you to better follow material covered in lectures and puts you in a better position to ask good questions during class.
4. *Work on the study problems listed in the lecture outlines.* I select questions from the text or elsewhere that are designed to help reinforce concepts presented in the lecture and readings. I do not routinely collect or grade these; they are, instead, are for "practice". **Don't** wait to work on these problems until right before the exam. You need to ensure that you understand the concepts as we are covering them since the topics in this course tend to build on one another. Also, don't be surprised if some of these problems end up on the exams! Additional problem sets may be distributed periodically and the solutions will be posted and/or discussed in class.
5. *Get help.* If you get stuck on a problem, or don't understand something from lecture, come to see me in a timely fashion. I have consistently observed that those students who come to my office with questions on a regular basis do the best in this course. Besides taking advantage of my office hours, feel free to contact me via e-mail with questions that arise as you are studying or working on practice problems. There are also numerous internet resources that can serve as tutorials or provide additional information on any course topic that might intrigue you.
6. *In general -- continue to refine and use good study habits.* Students who wait until the last minute to read the text, review the lecture notes, or study for an exam will quickly realize that the amount of material can be overwhelming. You should expect **to study a minimum of 6 hours per week for this course**. As noted above, **reading the assigned material prior** to attending the lectures is useful. **IN OTHER WORDS, COME TO CLASS PREPARED AND DON'T PROCRASTINATE IN YOUR STUDIES!**



**ATTENDANCE:** Students are expected to attend class and actively participate. In circumstances when students must miss lecture (see lab syllabus for attendance policy for that part of the course) for an official college function, please let me know ahead of time so we can make arrangements in advance. In the case of illness, please contact me as soon as you are able to and we will discuss options for dealing with missed material and work.

**ACADEMIC INTEGRITY:** In my opinion, academic integrity is of utmost importance and cheating will not be tolerated. Please read the Academic Honesty Policy that I distribute and sign and return the cover page.

**SPECIAL ACCOMODATIONS:** Students who wish to request accommodations in this class for a disability should contact Mr. Joe Kempfer, Assistant Director of Learning Services for Disability Support, 1307 Main Street (extension 1510). Accommodations cannot be provided until authorization is received from the office of Learning Services.



### **Tests/Assignments/Grading:**

I do look at trends in grades over the semester; improvement in test grades over the duration of the course will be favorably noticed! **Active** participation in class discussions, review periods, etc. is expected and will be a factor in the determination of final grades.

**The lecture portion of the course will count as 75% of your total course grade. The lecture grade will be determined as follows:**

	<u>% of final grade</u>
Tests <sup>1</sup>	55
Assignments, Quizzes and Class Participation <sup>2</sup>	25
Grant Proposal <sup>3</sup>	20
	<hr/>
	100 %

<sup>1</sup> **Tests:** Tests will be based on lecture material and assigned readings from both the text and journal articles. **No make-up exams** will be administered without an official medical or registrar's excuse.

### **Tentative test dates:**

Test #1 (15% of grade):	Tuesday, February 15 <sup>th</sup>
Test #2 (20% of grade):	Thursday, March 31 <sup>st</sup>
Test #3 (20% of grade):	During finals weeks (Thursday, May 5 <sup>th</sup> ; 8:30 am)

<sup>2</sup> **Assignments and quizzes:** Quizzes or assignments will be given to encourage you to keep up with the course material. Many of the assignments will involve the use of research articles from primary journals and/or the internet. I expect each of you to actively participate in class discussions and to complete all assignments in a timely and professional manner. There will be no make-ups for assignments or quizzes and **late work will not be accepted.**

### <sup>3</sup> **Grant Proposal:**

Each person enrolled in this course will be expected to write a research grant proposal. This is not a typical literature search type of term paper; rather, you will be expected to read up on a biochemical topic of personal interest and then propose experiments to address new, unanswered questions related to the topic. Development of project proposals and grant writing are an integral part of working in biochemistry and related fields, and the funding of such proposals by granting agencies is crucial for the continuation of research (and, often your job). Please start thinking about this assignment early in the semester.

Proposals will be graded on the basis of four main criteria:

#### **1. Scientific content:**

- Are the questions being asked logical and thought provoking?

- Would the proposed experiments answer the questions being asked?
- Is the proposal written at a level expected from a student in a 400-500 level biochemistry course?

**2. Justifications for the proposed study:**

- Has the project been well thought-out?
- Are the justifications logical and convincing to the reader? (i.e. Have you convinced me why I should fund your project over that of J. Doe, Ph.D.?!)

**3. Format of the proposal:**

- Is the style, grammar, level of "professionalism", etc. appropriate for a scientific grant proposal?
- Are all components of a typical grant proposal included?
- Have primary references been used and properly cited?

**4. Creativity/Originality of proposal:**

- Have original, unanswered questions been asked?
- What extent of effort was put into this assignment?
- Is the proposal just a rehashing of material found in articles or other sources? (It better not be - this would be a form of plagiarism.)

I have a collection of materials regarding grant writing that I will provide later in the semester. I also have some samples of previous students' proposals on file. I prefer that each of you select your own topic, based on a personal interest, rather than coming to me for an idea. However, I do want to approval all topics before you actually start writing the grant.

To keep everyone on tract on this grant project, I have listed a series of deadlines. There will be **no extensions** for these due dates.

Topic decision date:

An abstract describing the proposal topic:

Proposal due:

*(If you would like me to review a draft of your proposal, I would need to have it by April 4<sup>th</sup> in order to get it back to you in time for you to make revisions.)*

Proposal presentations (oral) to class

"review panel":

**Thursday, February 17<sup>th</sup>**

**Tuesday, March 1<sup>st</sup>**

**April 15<sup>th</sup> by 5:00 pm**

***To be presented in class the last week of the semester***