

BIOS E-10 – Introduction to Biochemistry

Robin Haynes, PhD

Class Meetings: On-line Only– Undergraduate and Graduate Credit

Section Meetings: Live and online with web conference technology.
Days and Times to be announced

Website: <https://canvas.harvard.edu/courses/7956>

Course Email: biochem.e10@gmail.com

Text: Reading assignments will be posted from Lehninger's Principles of Biochemistry, 5th edition. The ebook version is available for free through the following link.

<https://www.dropbox.com/s/g3fjghh71oeac5c/Lehninger%205th%20Edition.pdf?dl=0>

Note regarding the textbook: The textbook is recommended as a resource to help clarify concepts. Lecture material will come from many different sources including various textbooks and research journals. No graded assignments will be given directly from the text.

Prerequisites: Introductory Biology and Chemistry are strongly recommended.

Description: This course provides an overview of the main aspects of biochemistry by relating molecular interactions to their effects on the organism as a whole, especially as related to human biology. The organization of macromolecules is addressed through a discussion of their hierarchical structure and a study of their assembly into complexes responsible for specific biological processes. Topics addressing protein function include enzyme kinetics, the characterization of major metabolic pathways, and their interconnection into tightly regulated networks.

Course Material and Meetings:

Lectures. BIOS E-10 lectures (along with other course-related materials) are made available via the Internet. These on-demand streaming video/audio presentations can be viewed by students anywhere in the world, as long as they have a reasonably fast and reliable connection to the Internet and have installed the required software onto their computer. For more information on technical requirements and to view a sample lecture, see the following site:

<http://www.extension.harvard.edu/academics/courses/types-courses/video-course-guidelines>

Four of the lectures will be newly taped and thus also offered live on campus (Lectures 1, 4, 5, and 7). We invite you to attend these lectures if you are able, to meet the instructor and ask questions during the lecture. They will be streamed live while they are given, so you may also watch online, and the recording will be available for viewing over the internet 24 hours after each is given. Please see the schedule for the dates of these lectures.

All other lecture videos will be posted from the Fall 2015 semester of BIOS E-10, and made available on a weekly basis. **Videos will be posted on Fridays according to the schedule below.** Videos are located on the Virtual Classroom page, which will be added to the Canvas website when the semester begins. This page includes links for the live streaming section each week, for the live streams of the four lectures noted above when they are given, and for all recorded lectures and sections. All lectures will remain available from the date they are posted through the end of the semester. Lectures are not available for download.

Do not attempt to take this course online unless you have a reliable Internet connection and have installed the necessary software on your personal computer. Be sure to watch a sample lecture before the semester begins, to be certain that your computer is capable of receiving the streaming video and audio in an acceptable fashion.

Weekly Review Sections. It is highly recommended that each student attend a one-hour “review section” every week, **beginning the week of February 1st**. Some sections will be held by Teaching Fellows (TF) utilizing web conferencing software. Other sections will be held live at the Harvard campus with streaming technology for online attendance. This is your opportunity to work “directly” with a member of the teaching staff and to ask questions in real time. **The precise times for section meetings will be available on our website. You should consult the course website on a regular basis for announcements and updates.**

Office Hours: Dr. Haynes will hold office hours using web conferencing software. Details of the days and times will be announced at the start of class.

Grading; Exams and Problem Sets

All students will have 2 course assignments, 2 midterm exams, and a *noncumulative* final exam. Submission deadlines and exam dates and times are in Eastern Standard Time (EST).

Exams. If you live within the six-state New England area (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) you must come to campus to take your exam. ***PLEASE SEE THE SCHEDULE BELOW FOR THE DAY AND TIME OF THE ON-SITE EXAMS.*** If your primary address throughout the term is not in New England you may come to campus or you must find a qualified proctor near your home to administer the exam in absentia in a proctored setting. There are no online exams. Distance students must find and use approved proctors for their exams. Please read the following procedures under the heading “Proctored exams” carefully:

<http://www.extension.harvard.edu/resources-policies/exams-grades-transcripts/exams-online-courses>

THE PROCTORED EXAMS MUST BE ADMINISTERED WITHIN A 24-HOUR WINDOW OF THE ON-SITE EXAM. Please see the exam schedule below.

EXAM SCHEDULE:

On-Site Midterm 1: Friday, March 11th; 5:30-7:30 PM EST - Harvard Campus
Proctored Midterm must be completed in the following period of time:
March 10th, 5:30 PM EST to March 11th, 5:30 PM EST.

On-Site Midterm 2: Friday, April 15th; 5:30-7:30 PM EST – Harvard Campus
Proctored Final must be completed in the following period of time:
April 14th, 5:30 PM EST to April 15th, 5:30 PM EST

On-Site Final Exam: Friday, May 13th; 5:30-7:30 PM EST – Harvard Campus
Proctored Final must be completed in the following period of time:
May 12th, 5:30 PM EST to May 13th, 5:30 PM EST

Problem Sets. There are 2 graded problem sets. These should be uploaded on the course electronic dropbox by the indicated deadline. Late homework assignments will be accepted with a 10% deduction per day until the key is posted, and at that point no more assignments will be accepted.

Graduate Students: The graduate section will be formatted as a journal club with a group of graduate students presenting and leading a discussion of a different paper each week. **All graduate sections will be held on-line using interactive web conference software. The dates and times of these graduate sections will be determined.** Each graduate student is required to participate in leading the discussion of 1 paper. This will account for 50% of your graduate section grade. Your participation in the discussion of all other papers will account for another 50% of your section grade. Attendance at all discussions is mandatory, and absences will be reflected in your participation grade. For specific details, please see the “Graduate Section Assignment” handout that is posted on the website.

Assignment	Graduate	Undergraduate
Midterm exam 1	100	100
Midterm exam 2	100	100
Final exam	100	100
Course assignment 1	50	50
Course assignment 2	50	50
Graduate assignment	50	-
Section	100	-
Total points	550	400

Other important information

Regrades: Regrade requests must be submitted in writing to the instructor within one week of the exam/problem set return. Regrade requests should clearly indicate which question(s) you are requesting us to review and a justification of your request. Simply stating that your answer matched the key is not sufficient. No verbal regrade requests will be accepted.

Course Website: You will find many helpful resources on the course website including lecture slides, problem sets, practice problems, and assignment postings. To be able to fully access all the material you will need an official HUID and PIN. Your registration (DCE) ID and PIN will not work. If you have questions about your IDs and PINs, please visit the Extension School website: <http://www.extension.harvard.edu/registration/registration-guidelines/id-numbers-pins>

Final Exam: The Extension School handles final exam scheduling and any makeup requests. Visit their website for the necessary forms should you need to reschedule the final.

Disability Services: The Extension School is committed to providing an accessible academic community. The Disability Services Office offers a variety of accommodations and services to students with documented disabilities. Please visit the following website for more information. www.extension.harvard.edu/resources-policies/resources/disability-services-accessibility

Academic integrity: You are responsible for understanding Harvard Extension School policies on academic integrity (www.extension.harvard.edu/resources-policies/student-conduct/academic-integrity) and how to use sources responsibly. Not knowing the rules, misunderstanding the rules, running out of time, submitting "the wrong draft", or being overwhelmed with multiple demands are not acceptable excuses. There are no excuses for failure to uphold academic integrity. To support your learning about academic citation rules, please visit the Harvard Extension School Tips to Avoid Plagiarism (www.extension.harvard.edu/resources-policies/resources/tips-avoid-plagiarism), where you'll find links to the Harvard Guide to Using Sources and two, free, online 15-minute tutorials to test your knowledge of academic citation policy. The tutorials are anonymous open-learning tools.

Course Schedule, Spring 2016

Week	Video Release Or Live/streaming Lecture	Topics	Assignments/Exams	Weekly Sections Date/Time TBD
1	Jan. 29	Lecture 1 – LIVE-STREAMING (5:30-7:30 pm EST: Place TBD) Introduction; Water; Thermodynamics;		
2	Feb. 5	Lecture 2 Amino Acids; Proteins		Lecture 1 Review GRAD SECTION
3	Feb. 12	Lecture 3 Protein methodology; Hemoglobin/myoglobin		Lecture 2 Review; GRAD SECTION
4	Feb. 19	Lecture 4 – LIVE-STREAMING (5:30-7:30 pm EST: Place TBD) Enzymes and Kinetics	Problem set 1 Posted	Lecture 3 Review
5	Feb. 26	Lecture 5 –LIVE-STREAMING (5:30-7:30 pm EST: Place TBD) Nucleotides; Carbohydrates;		Lecture 4 Review GRAD SECTION
6	March 4	Lecture 6 Lipids, Membranes	Problem set 1 Due	Lecture 5 Review
	March 11		MIDTERM 1 Lectures 1-5 5:30-7:30 pm EST Room TBD	EXAM REVIEWS
8	March 18	SPRING BREAK		
7	March 25	Lecture 7 – LIVE-STREAMING (5:30-7:30 pm EST:Place TBD) Signaling; Intro to Metabolism; Glucose Metabolism	Problem set 2 Posted	Lecture 6 Review GRAD SECTION
	April 1	Lecture 8 Glucose Met (cont); Citric Acid Cycle; Electron Transport Chain		Lecture 7 Review GRAD SECTION
9	April 8	Lecture 9 Amino Acid metabolism; Nucleotide metabolism	Problem set 2 Due	Lecture 8 Review
10	April 15		MIDTERM 2 Lectures 6-8 5:30-7:30 pm EST Room TBD	EXAM REVIEWS
12	April 22	Lecture 10 Lipid Metabolism		Lecture 9 Review GRAD SECTION
13	April 29	Lecture 11 Regulation and Integration		Lecture 10 Review GRAD SECTION
14	May 6	Lecture 12 Diabetes		Lecture 11 Review GRAD SECTION
16	May 13		FINAL EXAM Lectures 9-12 5:30-7:30 pm EST Room TBD	EXAM REVIEWS