

Course Description
Fundamentals of Biochemistry
Biochemistry 401G
Spring 2014

Course description: Fundamentals of Biochemistry is designed for undergraduate and graduate students whose educational needs can be best satisfied by a one-semester biochemistry course. Introductory chemistry, organic chemistry, and biology are prerequisites for enrollment in BCH401G. BCH401G will introduce students to the general families of biomolecules that comprise biochemistry and the principles that integrate biochemistry with other chemical and biological disciplines.

Instructors: All instructors are faculty members in the Department of Molecular and Cellular Biochemistry and we are located in the BBSRB building (The building across Limestone that is connected by a walkway over Limestone to the UK Kentucky Clinic).

Instructor	Office	e-mail	Phone
Craig Vander Kooi (course director)	BBSRB, B263	craig.vanderkooi@uky.edu	323-8418
Becky Dutch (co-course director)	BBSRB, B171	rduc2@uky.edu	323-1795
Sabire Ozcan	BBSRB, B155	sozcan@uky.edu	257-4821
Yvonne Fondufe-Mittendorf	BBSRB, B273	y.fondufe-mittendorf@uky.edu	323-0091

Teaching Assistants: The teaching assistant is Megan Pannell (megan.pannell@uky.edu). She is available to help you understand biochemistry. Contact her to set up an appointment.

Class meeting: The course will meet at 3:00 PM MWF in Nursing 201. Students are urged to attend class. The lectures will highlight important concepts covered in the textbook and emphasize the material that will be covered on the examinations. We will be using TurningPoint to present lectures so that during class we can gauge student understanding. Starting with lecture 6, there will be two quiz questions each class period for which you will need a TurningPoint "ResponseCard" RF, otherwise known as a "clicker."

Office Hours: All instructors will announce their office hours in class or you can contact them at the Blackboard website.

Textbook: The textbook for this course is: *Biochemistry: A Short Course*, 2nd Edition, by Tymoczko, Berg and Stryer, W.H. Freeman publishers.

You will also need to purchase, registrar on Blackboard and bring to class a TurningPoint "ResponseCard" RF (clicker).

All course information is located at Blackboard (BB) website: <https://elearning.uky.edu/> (alternative logon: <https://elearning.uky.edu/webapps/portal/frameset.jsp>).

The BB BCH401G website has the following Topics at the left hand side of the page:

ANNOUNCEMENTS:	Announcements about lectures, tests and grading will be posted here.
SYLLABUS:	Contains the course Syllabus .
COURSE INFORMATION:	Contains reviews on mathematics and stereochemistry and copies and keys for the examinations from the last two years.
COURSE CONTENT:	Contains the Lecture Notes that you need to download and bring to class.
DISCUSSION BOARD:	Student questions for instructors about lectures or about other aspects of the course should be submitted here. The answers will be posted here also. This is the best way to have your questions answered because all students can benefit.
TOOLS:	This is where you register the identification code on your clicker using the "TurningPoint Registration Tool." You have to do this in order to receive a grade for the classroom quizzes. There are a lot more items here and you should use as needed
MY GRADES:	Check your grades here. If you do not see your grade check first with the Registrar to make sure you are registered. If you are, then contact Dr. Vander Kooi directly by e-mail at: craig.vanderkooi@uky.edu.
HELP:	Contact Dr. Vander Kooi if there is a mistake in your grade. Use as needed

For problems with Blackboard or to obtain a user account contact:

<http://wiki.uky.edu/Blackboard>

Examinations: Three hour examinations and a comprehensive final examination will be administered, as indicated on the course Syllabus, which will be handed out the first day of class and will be posted on Blackboard.

Short Papers (Graduate Students Only): Graduate students enrolled in BCH401G will be required, in addition to taking the hour and final examinations, to complete a paper on an assigned topic in biochemistry. The topic this semester is the biochemistry of breast cancer.

An abstract of no more than 200 words must be emailed to Dr. Vander Kooi (craig.vanderkooi@uky.edu) by February 14. The abstract should give a brief overview of the different types of breast cancer and describe the one

The papers are limited to four pages in length including text, figures, and tables (the list of references does not count as part of the 4 page limit). The paper must be single-spaced, have font size 12 (prefer Arial type style just like this document) and must have 1" margins all around. The paper should include discussion of the different types of breast cancer from a molecular perspective (~1 page). For one of the types, the paper must discuss the mechanism by which currently used therapy functions and how resistance to this therapy can occur (~3 pages). The paper should stress biochemistry including molecular mechanisms and structures while touching lightly on phenomenology and subject areas that are distantly related to biochemistry. **A copy of the paper must be e-mailed to Dr. Vander Kooi (craig.vanderkooi@uky.edu) by the end of the day on April 23.** Papers will be given one of three grades: high pass, pass, or fail. Papers that are not submitted by the due date or are not compliant with the typing requirements will be given a failing grade. **Literature references must be books or articles**

from scientific journals – references to web sites are NOT ACCEPTABLE. All papers will be checked for appropriate usage and referencing using ithenticate (www.ithenticate.com).

"Make up" Examinations: **Students are expected to take every examination, unless they have a qualified excused absence.** Students who miss an hour examination for an excused reason will not be given a make-up examination. Instead, the final examination will serve as the "make up" examination. See the section below on Grading Undergraduate or Graduate Students. An alternative final exam will be given for students who have three or more finals scheduled on Monday, May 5th, or an excused reason for the absence.

Excused Absences: Students need to notify the professor of absences prior to class when possible. S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit "reasonable cause for nonattendance" by the professor. **If you will be missing an examination for one of the above listed reasons, please contact Dr. Vander Kooi as soon as you are aware of the conflict.**

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (859-257-2754).

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused or unexcused) per university policy.

Verification of Absences: Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request "appropriate verification" when students claim an excused absence because of illness or death in the family. Appropriate notification of absences due to university-related trips is required prior to the absence.

Auditors: Students who wish to audit this course should see the course director.

Grading for Undergraduate Students: Grades for undergraduate students will be based on three one hour exams, a two hour comprehensive final examination, and class quizzes as shown in the table below. The examinations will count about 90% and the quizzes about 10% of the final grade.

	If you miss no examinations	If you miss one hour examination (excused absence only!)	If you miss two hour examinations (excused absence only!)	If you miss three hour examinations (excused absence only!)
Maximum Points for three hour exams, each worth 100 points	300	200	100	0

Maximum Points for Final examination	200	300	400	500
Maximum Points for Turning Point quizzes	50	50	50	50
Total points	550	550	550	550

Starting with lecture 6, there will be two quiz questions each lecture. You will use your clicker to answer the quiz question. Because of the possibility of absence due to valid reasons, such as illness, a flu pandemic, graduate or medical school interviews, etc., we will use only the 50 highest quiz scores, which is equivalent to missing 10 lectures without being penalized (50 quizzes X 1 pts = 50 points total).

At the end of the course, the numerical scores (total points) will be compiled and rank ordered from highest to lowest, and the instructors will determine the final cutoffs for all letter grades assigned in the course. The following grading scale may be modified down, but will not be modified up (i.e. if you get a 90, you will get an A in the course, but it is possible that a slightly lower percentage may earn an A, depending on the overall performance of the class).

90-100%	A
80-89%	B
70-79%	C
60-69%	D
<60%	F

Grading for Graduate and Post-baccalaureate Students: For graduate and post-baccalaureate students, grades will be determined on the basis of three one hour examinations, a comprehensive final examination, the class quizzes, and a short paper. The University Registrar will determine who is a post-baccalaureate student.

The examinations will count about 90% and the quizzes about 10% of the final grade.

	If you miss no examinations	If you miss one hour examination (excused absence only!)	If you miss two hour examinations (excused absence only!)	If you miss three hour examinations (excused absence only!)
Maximum Points for three hour exams, each worth 100 points	300	200	100	0
Maximum Points for Final examination	200	300	400	500
Maximum Points for Turning Point quizzes	50	50	50	50
Total points	550	550	550	550

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At the end of the course, the numerical scores (total points) will be compiled and rank ordered from highest to lowest, and the instructors will determine the final cutoffs for all letter grades assigned in the course. The following grading scale may be modified down, but will not be modified up (i.e. if you get a 90, you will get an A in the course, but it is possible that a slightly lower percentage may earn an A, depending on the overall performance of the class).

90-100%	A
80-89%	B
70-79%	C
<60%	E

The short paper will influence the final course grades as shown in the following table. For example, a graduate or post-baccalaureate student with a numerical score on the examinations equivalent to a B grade and a "high pass" on the short paper will receive an A grade in the course. However, a graduate student with a preliminary course grade of E and a "high pass" on the paper will receive an E in the course. That is, a "high pass" on the paper will not rescue a failing performance on the written examinations.

Final Course Grades for Graduate Students and Post-baccalaureate Students

Preliminary Grade based on examinations	Grade on Short Paper		
	high pass	pass	low pass
Final Grade			
A	A	A	B
B	A	B	C
C	B	C	E
D	C	E	E
E	E	E	E

Cheating: No form of cheating will be tolerated. Students are encouraged to read the Student Rights and Responsibilities with regard to cheating and plagiarism (<http://www.uky.edu/StudentAffairs/Code/>), parts II-V.

Accommodations due to disability: If you have a documented disability that requires academic accommodations, please notify me as soon as possible. In order to receive accommodations in this course, you must provide Dr. Vander Kooi with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

Syllabus, Biochemistry 401G, Spring 2014

Lecture	Day	Date	Readings	Lecturer	Topic
1	W	15-Jan	Ch 1	Vander Kooi	Introduction to BCH401G and Biochemistry
2	F	17-Jan	Ch 2	Vander Kooi	Water and Non-Covalent Interactions
	M	20-Jan			No lecture – Martin Luther King Holiday
3	W	22-Jan	Ch 3	Vander Kooi	Proteins: Amino Acids & Primary Structure
4	F	24-Jan	Ch 4	Vander Kooi	Proteins: Secondary & Tertiary Structure
5	M	27-Jan	Ch 4	Vander Kooi	Proteins: Quaternary Structure, Folding, and Methods
6	W	29-Jan	Ch 9	Vander Kooi	Hemoglobin, an allosteric protein
7	F	31-Jan	Ch 5	Vander Kooi	Techniques in Protein Biochemistry
8	M	3-Feb	Cancelled due to weather		
9	W	5-Feb	Ch 6	Vander Kooi	Enzymes: Biological Catalysts
		5-Feb			Last day to change grading options or drop course without it appearing on your transcript
10	F	7-Feb	Ch 7	Vander Kooi	Enzymes: Kinetics and Regulation
	M	10-Feb	Ch 8	Vander Kooi	Enzymes: Mechanisms and Inhibitors
11	W	12-Feb			Examination 1
12	F	14-Feb	Ch 10	Dutch	Carbohydrates
		14-Feb			Graduate Students: abstract of paper is due (send to Dr. Vander Kooi at: craig.vanderkooi@uky.edu)
13	M	17-Feb	Ch 11/12	Dutch	Lipids & Membranes
14	W	19-Feb	Ch 13	Dutch	Signal Transduction
15	F	21-Feb	Ch 14/15	Ozcan	Basic Concepts and Design of Metabolism
16	M	24-Feb	Ch 16	Ozcan	Glycolysis
17	W	26-Feb	Ch17	Ozcan	Gluconeogenesis
18	F	28-Feb	Ch 18	Ozcan	Citric acid cycle 1
19	M	3-Mar	Ch 19	Ozcan	Citric acid cycle 2
20	W	5-Mar	Ch 20	Ozcan	Electron transport and oxidative phosphorylation
21	F	7-Mar	Ch 21	Ozcan	Electron transport and oxidative phosphorylation
	M	10-Mar			Examination 2
22	W	12-Mar	Ch 24	Ozcan	Glycogen Degradation
23	F	14-Mar	Ch 25/26	Ozcan	Glycogen Synthesis/Pentose Phosphate
					Spring Break March 17 - 22
24	M	24-Mar	Ch 27/28	Ozcan	Fatty Acid Degradation/synthesis

25	W	26-Mar	Ch 29	Ozcan	Lipid Synthesis
26	F	28-Mar	Ch 30	Fondufe-Mittendorf	Amino acid Degradation/Urea Cycle
27	M	31-Mar	Ch 31	Fondufe-Mittendorf	Amino acid Synthesis
28	W	2-Apr	Ch 32	Fondufe-Mittendorf	Nucleotide metabolism
29	F	4-Apr	Ch 32/33	Fondufe-Mittendorf	Structure of DNA/RNA
30	M	7-Apr	Ch 33	Fondufe-Mittendorf	Structure of DNA/RNA
	W	9-Apr			Examination 3
31	F	11-Apr	Ch 34	Fondufe-Mittendorf	DNA replication
		11-Apr			Last day to drop a course or withdraw from University without urgent non-academic reasons
32	M	14-Apr	Ch 35	Fondufe-Mittendorf	DNA replication, repair, and recombination
33	W	16-Apr	Ch 35	Fondufe-Mittendorf	DNA replication, repair, and recombination
34	F	18-Apr	Ch 36	Fondufe-Mittendorf	Prokaryotic RNA Synthesis and regulation
35	M	21-Apr	Ch 37	Fondufe-Mittendorf	Eukaryotic gene expression
36	W	23-Apr	Ch 38	Fondufe-Mittendorf	RNA processing
37	F	25-Apr	Ch 39	Fondufe-Mittendorf	Genetic Code
		25-Apr			Short paper due from graduate students
38	M	28-Apr	Ch 40	Fondufe-Mittendorf	Protein synthesis
39	W	30-Apr	Ch 41	Dutch	Recombinant DNA technology
40	F	2-May	Ch 41	Dutch	Recombinant DNA technology
	M	5-May		3:30 pm	Final Examination (Nursing 201, same room as class lectures)