INTRODUCTION TO MEDICAL BIOCHEMISTRY

(BIOC 3261/BISC 3261)
Fall 2020 ONLINE
Hours: M, W 12.45-2 pm; F 12.45-1.35 pm
Dr. Vanderhoek jyvdh@gwu.edu
Office Hours: MW 2-3.30 or by appointment
Teaching Assistant: Juntian Wei (jwei48@gwu.edu)

Course Objectives: In order to gain an appreciation of our biochemical world, in the first half of the course, I will discuss the structures, properties and biochemistry of amino acids, carbohydrates, lipids, nucleic acids and proteins as well as enzymes and catalysis. In the second half, I will focus on energy metabolism and regulation, including metabolism of amino acids, carbohydrates and lipids.
At the end of the course, students should be able to

1. Summarize the basic structures, properties and biochemistry of amino acids, carbohydrates, lipids, membranes, nucleic acids and proteins
2. Summarize the basic properties of enzymes and classify the different types of enzymes based on their kinetic properties
3. Describe the major features, including regulatory aspects, of the metabolic pathways of carbohydrates, lipids and amino acids
4. Evaluate the interrelationships between these metabolic pathways under normal and certain abnormal or disease conditions.

*Course **Prerequisites**: CHEM 2151 and 2152*

This ONLINE Biochemistry course -Intro to Medical Biochemistry, Bioc/Bisc 3261- will be taught in a traditional lecture format during the FA 2020 semester.

WEBEX: Since this course will only be taught online using the WEBEX system, you should install the WEBEX system on your computer. A poor connection is not an excuse for missing or being late to class.

BLACKBOARD: I will use Blackboard on occasion. **The Syllabus and ALL TOPICAL REVIEW SHEETS** will be posted on **BLACKBOARD.** The **Review sheets** will become available at the beginning of each lecture topic class discussion.

EMAIL: You need to check your email regularly for course-related announcements.

TEXT: You have a choice of ONE of the following:

R. S. Ochs, Biochemistry (2014) or T. McKee and J.R. McKee, Biochemistry, the molecular basis of life, 5th edition, 2012, Oxford University Press

COURSE ATTENDANCE: Classes will be conducted ON WEBEX at the scheduled class times. At the beginning of each class, I will spend 5 min answering any questions from the previous lecture. You will be responsible for **all** the lecture material which is the result of roughly 30 years of teaching this type of course and will not easily be found in one textbook. The recommended textbooks are primarily to be used to allow a general background for some of the lecture material. If you miss a lecture, you should contact another classmate (NOT ME!!) to get the lecture notes as you will still be responsible for the missed

information. (I will answer questions on any lecture material). The exams will be based on material presented in class as well as the assigned chapters in either Ochs 'Biochemistry' or McKee and McKee 'Biochemistry'. At the start of each topic, I will provide **Review Sheets** (on Blackboard) that will summarize the important aspects of the topic

OFFICE HOURS: I will be available (via WEBEX) from 2-3.30 pm on Mondays and Wednesdays. If you cannot make these times, email me and we'll set up a different meeting time.

EXAMS: Since this is an online course, the administration of exams will follow a different format than is used in a typical classroom. Exams will be given on the days indicated in the syllabus during regular class time. Students must come to 'class' on the day of the exam and sign in to Webex 5-10 min before the exam. The exams will have a time limit so each student must sign in and be ready when the exam becomes available. Each student is to make sure that their audio and video remain ON in order to hear any questions and answers regarding the exam. The exam will then be emailed (via Blackboard) to everyone. Students must remain visible on Webex while taking the exam. When each student is finished with the exam, s(he) is to **immediately** email the completed exam to both Juntian Wei (TA) as well as Dr. Vanderhoek. Once this is done, the student is allowed to sign off Webex. If you are unable to take the exam due to extreme and/or unusual circumstances, you must notify Dr. Vanderhoek ahead of time!! If an exam delay is granted, a make-up exam will be given.

HOMEWORK: Part of your final grade (see below) will include how well you do on homework assignments. I expect that these assignments should help your course performance. SaplingLearning.com is an online homework site (cost ($42 but included in the price of McKee and McKee) and you must log in to access this course and complete the assigned homework. To enroll, please go to www.saplinglearning.com/login. The direct link to the course site is: George Washington University – Bioc 3261 – Fall2020 – VANDERHOEK.

GRADING: Three exams and a Final exam will constitute the main part of the final grade. However, it should be noted that each exam represents a different percentage of the final grade that reflects the increasing scope of the covered material. Exam I will be worth 18.2%, Exam II will be worth 22.2%, Exam III will be worth 25.5% and the Final Exam will be worth 28.5%. Note that the Final Exam will cover all topics but will mostly emphasize material covered since Exam III. All exams may require some textbook information not covered in lectures. Successful completion of homework problems (Sapling) is worth 5.6% (of the final grade) and these are due on the listed due date. Exam makeup policy - no makeup will be allowed unless a) permission is granted prior to the scheduled exam, b) hospitalization or c) other emergency.

In addition, I may give 1 or 2 pop quizzes (either at beginning or end of a class session). If answered correctly, these scores will be added to your total grade.

The following point distribution will be followed:

Exam I	182 points
Exam II	222
Exam III	255
Final Exam	285
Homework Problems	56 (14 @ 4 each)
TOTAL	1000

Date		**Topic**	**Ochs**	**McKee/McKee**
INTRODUCTION				Chapter
Aug	31	Overview, Water, Buffers, Bonding	1-2	3
STRUCTURE AND CATALYSIS				
Sept	2	Lipids	3	11
	4	Lipids *Problem set #1 due*	3	11
	7	LABOR DAY – NO CLASS		
	9	Lipids/ Membrane and Transport	3	11
	11	Membrane and Transport	3	11
	14	Membrane and Transport	3	11
	16	Carbohydrates	4	7
	18	Carbohydrates	4	7
	21	Carbohydrates	4	7
	23	Amino Acids and Peptides	3	5
	25	Amino Acids and Peptides	3	5
	28	EXAM I [* Note this exam WILL cover Buffers, Lipids, Carbohydrates, Membranes and Transport **AND** Nucleic Acids (to be done on your own!! chapter 15 (Ochs) or 17 (McK&McK)] *Exam time will be extended to 3 pm!*		
	30	Proteins	5	5
Oct	2	Proteins	5	5
	5	Proteins/Enzymes	5-6	5-6
	7	Enzymes	6	6
	9	FALL BREAK – NO CLASS		
	12	Enzymes	6	6
BIOENERGETICS AND METABOLISM				
	14	Principles of Bioenergetics	7	4
	16	Review		
	19	EXAM II (* This exam will cover amino acids/peptides, proteins and enzymes) *Exam time will be extended to 3 pm!!*		
	21	Principles of Bioenergetics	7	4
	23	Electron Transport/Oxidative Phosphorylation	10	10
	26	Electron Transport/Oxidative Phosphorylation	10	10
	28	Citric Acid Cycle	9	9
	30	Citric Acid Cycle	9	9
Nov	2	Fatty Acid Oxidation	13	12
	4	Fatty Acid Oxidation	13	12
	6	Review		
	9	EXAM III (Will cover ETS/ox phos, TCA and FA oxidation). *Exam time will be extended to 3 pm!!*		
	11	Catabolism of Glucose	12	8
	13	Catabolism of Glucose	12	8
	16	Catabolism of Glucose	12	8

	18	Carbohydrate Biosynthesis	12	8
	20	Carbohydrate Biosynthesis	12	8
	23	Amino Acid Metabolism	14	15
	25	THANKSGIVING HOLIDAY		
	27	THANKSGIVING HOLIDAY		
	30	Amino Acid Metabolism	14	14
Dec	2	Lipid Biosynthesis,	13	12
	4	Lipid Biosynthesis	13	12
	7	Metabolic Integration	13	12
	9	Review		
	14	FINAL EXAM (This is a tentative date, depending on the final FINAL EXAM SCHEDULE)		

University Policy on Religious Holidays

1. Students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance.
2. Faculty should extend to these students the courtesy of absence without penalty on such occasions, including permission to make up examinations.
3. Faculty who intend to observe a religious holiday should arrange at the beginning of the semester to reschedule missed classes or to make other provisions for their course-related activities

Support for Students Outside the Classroom

Disability Support Services (DSS)

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: gwired.gwu.edu/dss/

Mental Health Services 202-994-5300

The University's Mental Health Services offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations confidential assessment, counseling services (individual and small group), and referrals. counselingcenter.gwu.edu/

Academic Integrity Code Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information. For the code, see: studentconduct.gwu.edu/code-academic-integrity