Proteins, Pathways and Human Health
(BIOC 6221)
Fall 2020 ONLINE
Hours: M, W 6-8 pm
Course Director: Dr. Vanderhoek
Office Hours by appointment
Communication (email): jyvdh@gwu.edu
Teaching Assistant: Juntian Wei (jwei48@gwu.edu)

Course Objectives:

This course focuses on the relationship between protein structure and functions, and connections between metabolic pathways and human diseases. At the end of the course, you will be able to understand fundamental concepts, principles and metabolic pathways in the context of

(1) biochemistry research and
(2) applications of biochemistry knowledge to humans in healthy and diseased states and
(3) how biochemistry knowledge is used for the development of strategies and agents to maintain human health and to treat and prevent diseases.

Course Materials:

Primary text: Biochemistry (9th edition) by Jeremy M. Berg, John L. Tymoczko and Lubert Stryer. New York: W.H. Freeman 2019, ISBN 978-1-319-11467-1. This is also available as an e-book through the Himmelfarb library.

Other books: Pathophysiology of Disease, An introduction to clinical medicine (8th ed) by Gary D. Hammer and Stephen J. McPhee, available on line as ebook through the Himmelfarb library.

Principles of Biochemistry (7th ed) by Nelson and Cox. W.H. Freeman 2017, ISBN 978-1-464-12116. The E-version of the Medical Biochemistry (3rd edition) by John W. Baynes and Marek H. Dominiczak is available through the Himmelfarb library (http://proxygw.wrlc.org/login?url=https://www.clinicalkey.com/dura/browse/bookChapter/3-s2.0-C20110076986)

Harper's Illustrated Biochemistry by Victor W. Rodwell, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil. New York : Mcgraw-Hill Education, 2015.

Course Topics and Lecture Schedule

Date		Lecture title	Lecturer
August	31	Introduction, Cardiac Function & Disorders	Weglicki
Sept	2	Vascular Function & Disorders	Weglicki
	7	LABOR DAY - NO CLASS	

Sept	9	Pulmonary Function and Disorders	Weglicki
	14	Hematology Function and Disorders	Weglicki
	16	**EXAM 1**	
	21	Protein Folding	Hu
	23	Protein Structure Modeling: From Sequence to Function	Hu
	28	Protein-protein interactions	Hu
	30	Protein Engineering	Hu
Oct	5	**EXAM 2**	
	7	Enzyme Kinetics	Vanderhoek
	12	Enzyme Regulation	Vanderhoek
	14	Carbohydrate metabolism	Vanderhoek
	19	Gluconeogenesis	Vanderhoek
	21	Beta-oxidation of fatty acids	Vanderhoek
	26	Amino acid metabolism	Vanderhoek
	28	Independent Reading Day	Vanderhoek
Nov	2	**EXAM 3**	
	4	Cholesterol metabolism and metabolic disorders	Pei
	9	Cholesterol and Bile metabolism	Pei
	11	Steroid metabolism	Pei
	16	Lipoproteins and atherosclerosis	Pei
	18	**EXAM 4**	
	23	Oxidative stress and pancreatic abnormalities	Dimri
	25	THANKSGIVING BREAK – NO CLASS	
Nov	30	Alzheimer's Disease	Dimri

Dec	2	Cell death	Berg
	7	The master metabolic regulators AMPK and mTOR	Gupta
	9	Eicosanoid metabolism/2nd messengers	Vanderhoek
	14	**EXAM 5**	

Missed Exam Policy

To be eligible to schedule a make-up exam, you must have e-mailed or spoken with the course director ***prior*** to missing an exam or given timely notification that you were sick on the day of exam.

Student Evaluation

There will be 5 examinations and each will ONLY cover the material since the previous exam. There will be no cumulative final exam. Multiple choice, short answer and essay are all available options for exam formats. Since different amounts of material are covered in these exams, the value of each exam is as follows:

Exam 1	17%
Exam 2	17%
Exam 3	17%
Exam 4	27%
Exam 5	22%
TOTAL	100%

The grading scale for the course will be as follows:

A = 91-100
A- = 89-90
B+ = 86-88
B = 81-*85*
B- = 79-80
C+ = 75-78
C = 70-74
C- = 65-69
F = ≤ 64

University policies:

University policy on observance of religious holidays

In accordance with University policy, 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.

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. Faculty should extend to these students the courtesy of absence without penalty on such occasions, including permission to make up examinations. 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. For details and policy, see: students.gwu.edu/accommodations-religious-holidays.

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 details and complete code, see: studentconduct.gwu.edu/code-academic-integrity

Safety and security

In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.

Adverse Weather/Class cancellation

The instructor will follow the recommendations of the GWU in the event of severe weather or other threats. Students should call the university hotline at 202-994-5050 or check online at www.gwumc.edu. The course director will adjust the class schedule in the event of cancelled classes.

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 see: disabilitysupport.gwu.edu/

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. For additional information see: counselingcenter.gwu.edu/