Fall 2021 Syllabus

Integrative Physiology and Pharmacology (PHRM 308)

PHRM 308 A (in-person)
Class Time: MWF: 10:50 am – 11:40 am
Location: Aiken Center 110

PHRM 308 OL1 (remote)
Class Time: MWF: 10:50 am – 11:40 am
Location: MS Teams

Course Director: George C. Wellman, Ph.D.
E-mail: gwellman@uvm.edu

Office hours: In-person or MS Teams by appointment—please email to schedule a time.

Course Overview: This graduate level course, which is intended for students pursuing careers in basic scientific research or health-related fields, is designed to combine general physiological principles with examples of disease-based pathophysiology and targeted pharmacological approaches. Case studies will be used throughout this course to integrate material and highlight the impact of these processes on human function.

Required Course Materials:
All required course materials including lecture slides and assigned readings (e.g., case studies) will be available on the course BlackBoard site. Additional readings and reference materials may also be posted on BlackBoard.

Recommended Text Books:
There are no required textbooks for this course, however, students may find the following to be useful resources for general information on topics covered in class:

- *Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy* (Golan, Armstrong and Armstrong; Wolters Kluwer, 4th edition). e-book access: http://ezproxy.uvm.edu/login?url=https://meded.lwwhealthlibrary.com/book.aspx?bookid=1765
- *Human Physiology: An Integrated Approach* (Silverthorn; Pearson, 8th edition). Printed copy place on Reserve in Dana Library for this course.
- *Cardiovascular Physiology* and *Renal Physiology* from The Mosby Physiology Monograph Series. E-book access for Cardiovascular Physiology: http://ezproxy.uvm.edu/login?url=https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20160042845. E-book access for Renal Physiology: http://ezproxy.uvm.edu/login?url=https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20160042833
- Basic and Clinical Pharmacology (Betram G. Katzung: Lange 15th edition). E-book access: http://ezproxy.uvm.edu/login?url=https://accessmedicine.mhmedical.com/book.aspx?bookid=2988

- UpToDate®: uptodate.com

Class Recordings: Our class sessions will be audio-visually recorded for students in the class to refer back to, and for enrolled students who are unable to attend live. Students who participate with their

camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the chat feature, which allows students to type questions and comments live.

Academic Integrity: All assignments are to be completed independently without help from others (including other students in the course). Answers are expected to be unique and the students' own original work. Please make sure you understand the UVM Code of Academic Integrity (https://www.uvm.edu/policies/student/acadintegrity.pdf).

Grading: Grades will be based on **Case Study Quizzes** (**25 % of total grade**), **4 Exams** (**60 % of total grade**), **Written Assignments** (**10 % of total grade**), and **Class Participation** (**5 % of total grade**).

Case Study Quizzes:
Six cases studies will be presented during the semester (see class schedule for dates). Students are expected to read these case studies in advance. On the day of discussion, a short, 10-minute quiz will be administered at the start of class.

Exams: Four exams will be administered during the semester (see class schedule on the following page).

Written Assignments: **Mini-review Due 11-19-2021**
The objective is to provide a concise and comprehensive review on a specific disease/pathology of the students' choice. This paper should include descriptions of the physiological processes that are compromised, the molecular basis of the pathology, symptoms/prognosis, currently approved treatments, and future directions of research in this field. There is a 10-page (double spacing using 12 pt font) limit on the length of this paper (excluding figures and references) and each paper must include a minimum of 15 references and 2-4 figures. The content of this paper must be original material written specifically for this assignment (i.e., you cannot reuse a paper written for another course).

Class Participation: Grades will be based on attendance and participation in class discussions. Students are expected to attend lectures in-person. Students enrolled remotely are expected to attend lectures and participate in discussions via MS Teams.

If a student will not be able to attend in-person classes for qualifying health reasons, Student Health Services (SHS) will send a notification to the appropriate student services office or designated staff member informing them of this along with the dates the student is unable to attend. The SHS notification will specify whether the request for flexibility is only around in-person class attendance or includes additional flexibility for assignments and tests because the student is too ill to participate. Students are responsible for working with the course director to make up class content and work they miss due to a documented illness.

The table below defines the nominal cut-offs for graduate student grades in the course relative to percentile scores.

A+	99-100	B+	87-89	C+	77-79		
A	93-98	B	83-86	C	73-76	F	<70
A-	90-92	B-	80-82	C-	70-72		

Class Schedule:

Date			Topic
8/30	(M)	1.1	Introduction and Course Overview
9/01	(W)	1.2	Nociceptors and Pain
9/03	(F)	1.3	Analgesics
9/06	**(M)**		**Labor Day Holiday**
9/08	(W)	1.4	Analgesics continued
9/10	**(F)**	**1.5**	**Quiz and Case Study: Case 6-2019 NEJM 2019; 380:722-779.**
9/13	(M)	1.6	Autonomic NS: Sympathetic physiology
9/15	(W)	1.7	Sympathetic pharmacology
9/17	**(F)**	**1.8**	**Quiz and Case Study: Case 13-2001 NEJM 2001; 344:1314-1320**
9/20	(M)	1.9	Parasympathetic physiology
9/22	(W)	1.10	Parasympathetic pathophysiology/pharmacology
9/24	**(F)**		**EXAM 1**
9/27	(M)	2.1	Nicotinic receptors and the neuromuscular junction
9/29	(W)	2.2	Neuromuscular blocking drugs
10/01	(F)	2.3	Introduction to cardiovascular disease: hypertension and stroke
10/04	(M)	2.4	Hypertension Management: Initial Treatment of Hypertension
10/06	(W)	2.5	Anti-hypertensive drugs
10/08	(F)	2.6	Ischemic stroke
10/11	**(M)**	**2.7**	**Quiz and Case Study: NEJM case 13-2016**
10/13	(W)	2.8	Hemorrhagic stroke
10/15	(F)	2.9	Vascular Dementia
10/18	**(M)**		**EXAM 2**
10/20	(W)	3.1	Pathophysiology of ischemic heart disease
10/22	(F)	3.2	Management of chronic coronary artery disease (CAD)
10/25	(M)	3.3	Management of Acute Coronary Syndrome
10/27	**(W)**	**3.4**	**Quiz and Case Study: NEJM 15-2018**
10/29	(F)	3.5	Pathophysiology of heart failure
11/01	(M)	3.6	Management of heart failure
11/03	**(W)**	**3.8**	**Quiz and Case Study: NEJM 24-2020**
11/05	(F)	3.7	Electrical Activity in the Heart: Normal Sinus Rhythm
11/08	(M)	3.8	Pathophysiology of arrhythmias
11/10	(W)	3.9	Antiarrhythmic approaches
11/12	**(F)**		**EXAM 3**
11/15	(M)	4.1	Kidney: Structure/Function
11/17	(W)	4.2	Glomerular filtration
11/19	(F)	4.3	Solute reabsorption: Proximal tubule **(written assignment due)**
11/22	**(M)**		**Thanksgiving Recess**
11/24	**(W)**		**Thanksgiving Recess**
11/26	**(F)**		**Thanksgiving Recess**
11/29	(M)	4.4	Solute reabsorption continued
12/01	(W)	4.5	Water and Electrolyte Homeostasis
12/03	(F)	4.6	Diuretics
12/06	(M)	4.7	Renal Failure
12/08	**(W)**	**4.8**	**Quiz and Case Study: NEJM 12-2017**
12/10	(F)	4.9	Last day of class
12/17	**(M)**		**Final Exam ** starts at 10:30 am**