Fall 2024 Syllabus

Integrative Physiology and Pharmacology (PHRM 6080A)

PHRM 6080 A (in-person)
Class Time: MWF: 10:50 am – 11:40 am
Location: Aiken Center 110

Course Director: George C. Wellman, Ph.D.
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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 Brightspace site. Additional readings and reference materials may also be posted on Brightspace.

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 on Reserve in Dana Library for this course.
- Basic and Clinical Pharmacology (Betram G. Katzung: Lange 16th edition). E-book access:
- https://ezproxy.uvm.edu/login?url=https://accessphysiotherapy.mhmedical.com/book.aspx?bookid=3382
- UpToDate®: uptodate.com

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 (21 % of total grade), 4 Exams (60 % of total grade), Written Assignments (15 % of total grade), and Class Participation (4 % of total grade).

Case Study Quizzes:
Five cases studies will be presented during the semester (see class schedule for dates). Students are expected to read these case studies in advance. A short quiz on the material will be administered prior to class.

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

Written Assignments: **Mini-review Due 12-04-2024**
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). Late papers will be docked 5 points per each day late.

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

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
8/26	(M)	1.1	Introduction and Course Overview
8/28	(W)	1.2	Nociceptors and Pain
8/30	(F)	1.3	Analgesics
9/02	**(M)**		**Labor Day Holiday**
9/04	(W)	1.4	Analgesics continued
9/06	**(F)**	**1.5**	**Quiz and Case Study: Case 6-2019 NEJM 2019; 380:722-779.**
9/09	(M)	1.6	Analgesic wrap up and sympathetic nervous system physiology
9/11	(W)	1.7	Sympathetic NS pharmacology
9/13	**(F)**	**1.8**	**Quiz and Case Study: Case 13-2001 NEJM 2001; 344:1314-1320**
9/16	(M)	1.9	Sympathetic NS pharmacology continued
9/18	**(W)**	**1.10**	**Study Day: No Class**
9/20	**(F)**		**EXAM 1**
9/23	(M)	2.1	Parasympathetic physiology
9/25	(W)	2.2	Parasympathetic pathophysiology/pharmacology/Nicotinic receptors
9/27	(F)	2.3	Drugs blocking the Neuromuscular Junction
9/30	(M)	2.4	Introduction to cardiovascular disease and hypertension
10/02	(W)	2.5	Initial Treatment of Hypertension

10/04	(F)	2.6	Anti-hypertensive drugs
10/07	(M)	2.7	Ischemic stroke
10/09	**(W)**	**2.8**	**Quiz and Case Study: NEJM case 13-2016**
10/11	**(F)**		**Fall Recess**
10/14	(M)	2.9	Hemorrhagic stroke & wrap up
10/16	**(W)**		**EXAM 2**
10/18	(F)	3.1	Pathophysiology of ischemic heart disease
10/21	(M)	3.2	Management of chronic coronary artery disease (CAD)
10/23	(W)	3.3	Management of Acute Coronary Syndrome
10/25	**(F)**	**3.4**	**Quiz and Case Study: NEJM 15-2018**
10/28	(M)	3.5	Pathophysiology of heart failure
11/30	(W)	3.6	Management of heart failure
11/01	**(F)**	**3.7**	**Quiz and Case Study: NEJM 24-2020**
11/04	(M)	3.8	Heart failure continued
11/06	(W)	3.9	CAD and heart failure wrap up
11/08	**(F)**		**EXAM 3**
11/11	(M)	4.1	Electrical Activity in the Heart: Normal Sinus Rhythm
11/13	(W)	4.2	Pathophysiology of arrhythmias
11/15	(F)	4.3	Antiarrhythmic approaches
11/18	(W)	4.4	Kidney: Structure/Function
11/20	(W)	4.5	Glomerular filtration
11/22	(F)	4.6	Solute reabsorption: Proximal tubule
11/25	**(M)**		**Thanksgiving Recess**
11/27	**(W)**		**Thanksgiving Recess**
11/29	**(F)**		**Thanksgiving Recess**
12/02	(M)	4.7	Solute reabsorption continued
12/04	**(W)**	4.8	Water and Electrolyte Homeostasis **(written assignment due)**
12/06	**(F)**	**4.9**	**LAST DAY OF CLASS**
12/13	**(F)**		**Final Exam**