

## **Integrative Physiology and Pharmacology (PHRM 308) Fall 2020 Syllabus**

Course Director: George C. Wellman, Ph.D.  
E-mail: [gwellman@uvm.edu](mailto:gwellman@uvm.edu)

PHRM 308 A (mixed)  
Class Time: MWF: 10:50 am – 11:40 am  
Location: James Jeffords Hall 127

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

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 as a means to integrate material and highlight the impact of these processes on human function.

### Course Materials and Recommended Text Books:

All required course materials including lecture slides and assigned readings will be available on the course BlackBoard site.

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, 4<sup>th</sup> edition)
- *Basic and Clinical Pharmacology* (Betram G. Katzung: Lange 14<sup>th</sup> edition)
- *Human Physiology: An Integrated Approach* (Silverthorn; Pearson, 8<sup>th</sup> edition) to be a useful resource for general information on topics covered in class.
- UpToDate®
- *Cardiovascular Physiology and Renal Physiology* from The Mosby Physiology Monograph Series

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)**, **Written Assignments (20 % of total grade)**, **4 Exams (50 % of total grade)**, and Class Participation (**5 % of total grade**).

### Written Assignments:

#### **Mini-review Due 11-23-2020**

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 Schedule:

<b>Date</b>	<b>Topic</b>		
8/31 (M)	1.1	Introduction and Course Overview	
9/02 (W)	1.2	Nociceptors and Pain	
9/04 (F)	1.3	Non-opioid Analgesics	
<b>9/07 (M)</b>		<b>Labor Day Holiday</b>	
9/09 (W)	1.4	Opioid Analgesics	
<b>9/11 (F)</b>	<b>1.5</b>	<b>Quiz and Case Study: Case 6-2019 NEJM 2019; 380:722-779.</b>	
9/14 (M)	1.6	Autonomic NS physiology	
9/16 (W)	1.7	Sympathetic NS pharmacology (non-cardiovascular)	
<b>9/18 (F)</b>	<b>1.8</b>	<b>Quiz and Case Study: Case 13-2001 NEJM 2001; 344:1314-1320</b>	
9/21 (M)	1.9	Parasympathetic NS physiology/pathophysiology/pharmacology	
9/23 (W)	1.10	Neuromuscular Junction and Neuromuscular blocking drugs	
<b>9/25 (F)</b>		<b>EXAM 1</b>	
9/28 (M)	2.1	Introduction to cardiovascular disease: hypertension and stroke	
9/30 (W)	2.2	Hypertension Management: Initial Treatment of Hypertension	
10/02 (F)	2.3	Anti-hypertensive drugs: Part I	
10/05 (M)	2.4	Anti-hypertensive drugs: Part II	
10/07 (W)	2.5	Ischemic stroke	
<b>10/09 (F)</b>	<b>2.6</b>	<b>Case study: NEJM case 13-2016</b>	
10/12 (M)	2.7	Intracerebral hemorrhage	
10/14 (W)	2.8	Subarachnoid hemorrhage	
<b>10/16 (F)</b>		<b>EXAM 2</b>	
10/19 (M)	3.1	Pathophysiology of ischemic heart disease	
10/21 (W)	3.2	Management of chronic coronary artery disease (CAD)	
10/23 (F)	3.3	Management of Acute Coronary Syndrome	
10/26 (M)	3.4	Pathophysiology of heart failure	
<b>10/28 (W)</b>	<b>3.5</b>	<b>Case Study: NEJM 15-2018</b>	
10/30 (F)	3.6	Management of heart failure	
11/02 (M)	3.7	Electrical Activity in the Heart: Normal Sinus Rhythm	
11/04 (W)	3.8	<b>Case study: NEJM 24-2020</b>	
11/06 (F)	3.9	Pathophysiology of arrhythmias	
11/09 (M)	3.10	Antiarrhythmic approaches	
11/11 (W)	3.11	Flex day	
<b>11/13 (F)</b>		<b>EXAM 3</b>	
11/16 (M)	4.1	Kidney: Structure/Function	
11/18 (W)	4.2	Glomerular filtration	
11/20 (F)	4.3	Solute reabsorption: Part I	
<b>11/23 (M)</b>	4.4	<b>Solute reabsorption: Part II (written assignment due)</b>	
<b>11/25 (W)</b>		<b>Thanksgiving Recess</b>	
<b>11/27 (F)</b>		<b>Thanksgiving Recess</b>	
<b>11/30 (M)</b>	<b>4.5</b>	<b>Case Study: NEJM 12-2017</b>	
12/02 (M)	4.6	Water and Electrolyte Homeostasis	
12/04 (F)	4.7	Diuretics	
<b>12/07 (M)</b>		<b>Final Exam</b>	