

Integrative Physiology and Pharmacology (PHRM 308) Fall 2019 Syllabus

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Class Time: MWF: 10:50 am – 11:40 am
Location: Room 122 Hills Building

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 that *Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy* (Golan, Armstrong and Armstrong; Wolters Kluwer, 4th edition) and *Human Physiology: An Integrated Approach* (Silverthorn; Pearson, 8th edition) to be a useful resource for general information on topics covered in class. *Cardiovascular Physiology* and *Renal Physiology* from The Mosby Physiology Monograph Series are also excellent resources.

Grading: Grades will be based on in-class quizzes (**10 % of total grade**), a written assignment (**10 % of total grade**), 4 exams (**75 % of total grade**) and class participation (**5 % of total grade**). Exams will be a combination of multiple choice questions and short answer questions.

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

A+	99-100	B+	87-89	C+	77-79		
A	94-98	B	83-86	C	73-76	F	<70
A-	90-93	B-	80-82	C-	70-72		

Written Assignments: Papers are due on or before 11-22-2019. Instructions/guidelines for this assignment are provided on the last page of this syllabus.

Academic Integrity: All assignments, take-home or in-class, 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>).

Class Schedule:

Date	Topic
8/26 (M) 1.1	Course Introduction and Overview of the peripheral nervous system
8/28 (W) 1.2	Nociceptors and pain
8/30 (F) 1.3	Analgesics
9/2 (M)	Labor Day Holiday
9/4 (W) 1.4	Case Study: Case 6-2019 NEJM 2019; 380:722-779.
9/6 (F) 1.5	Nicotinic Receptors and the Neuromuscular Junction
9/9 (M) 1.6	Neuromuscular blocking drugs
9/11 (W) 1.7	Parasympathetic NS pathophysiology/pharmacology
9/13 (F) 1.8	Sympathetic NS physiology
9/16 (M) 1.9	Sympathetic NS pathophysiology/pharmacology
9/18 (W) 1.10	Case Study: Case 13-2001 NEJM 2001; 344:1314-1320; Review Article: NEJM 2019; 381: 552-565
9/20 (F)	EXAM 1
9/23 (M) 2.1	Introduction to cardiovascular disease and hypertension
9/25 (W) 2.2	Hypertension management: Part I
9/27 (F) 2.3	Hypertension management: Part II
9/30 (M) 2.4	Case study:
10/2 (W) 2.5	Introduction to stroke and subarachnoid hemorrhage
10/4 (F) 2.6	Ischemic stroke and deep vein thrombosis
10/7 (M)	Peripheral vascular disease and diabetes
10/9 (W) 2.6	Case study: NEJM case 13-2016
10/11 (F) 2.7	EXAM 2
10/14 (M)	Fall Recess
10/16 (W) 3.1	Pathophysiology of ischemic heart disease
10/18 (F) 3.2	Management of chronic coronary artery disease (CAD)
10/21 (M) 3.3	Management of Acute Coronary Syndrome
10/23 (W) 3.4	Pathophysiology of heart failure
10/25 (F) 3.5	Pathophysiology of heart failure
10/28 (M) 3.6	Case Study: NEJM 15-2018
10/30 (W) 3.7	Electrical Activity in the Heart: Normal Sinus Rhythm
11/1 (F) 3.8	Pathophysiology of arrhythmias
11/4 (M) 3.9	Antiarrhythmic approaches
11/6 (W) 3.10	Case study:
11/8 (F)	EXAM 3
11/11 (M) 4.1	Kidney: Structure/Function
11/13 (W) 4.2	The Nephron: Part I
11/15 (F) 4.3	The Nephron: Part II
11/18 (M) 4.4	Glomerular filtration
11/20 (W) 4.5	Water Homeostasis
11/22 (F) 4.6	Electrolyte Homeostasis (written assignment due)
11/25 (M)	Thanksgiving Recess
11/27 (W)	Thanksgiving Recess
11/29 (F)	Thanksgiving Recess
12/2 (M) 4.7	Diuretics
12/5 (W) 4.8	Renal Failure
12/6 (F) 4.9	last day of class
12/9 (M)	10:30 am Final Exam 122 Hills Building

Integrative Physiology and Pharmacology (IPP)

Paper Guidelines

Deadline for paper submission: 11-22-2019

General Guidelines:

Word limit: 1000 words (excluding references and figure legend)

References:

- 10 references maximum
- References must be from peer-reviewed scientific journals (i.e., no websites or text books)
- The majority of references should be primary literature (i.e., not reviews)
- Use NEJM citation/reference format

Figures:

- 1 maximum
- The figure must be the student's own, original work.
- All abbreviations should be defined within the figure legend.
- Figure and legend should be on a separate page following the reference section.

Option 1: Editorial

- Objective is to provide commentary and analysis on an "Original Contribution" published with the *NEJM* within the past 3 years. Articles published as "Case Studies" are not acceptable.
- Paper should be written as if being submitted to *NEJM* as an "editorial" (see journal website for examples).
- The selected paper should be an original article that is **NOT accompanied by a published editorial or be the topic of subsequent correspondence** (e.g., commentaries or letters to the editors).

Option 2: Clinical Implications of Basic Research

- Objective is to discuss a single preclinical journal paper explaining findings and commenting on possible clinical applications. Authors may not write commentary on their own published work (or work published from a laboratory that they have worked in).
- The selected paper should be published in one of the following journals: Science, Nature, Cell, Neuron, PNAS, Circulation or Circulation Research that is **NOT accompanied by a published editorial or be the topic of subsequent correspondence** (e.g., commentaries or letters to the editors). Selected papers should be published with the past three years.
- Paper should be written as if being submitted to *NEJM* as a "Clinical Implications of Basic Research" paper (see journal website for examples).