

## **HUMAN PHYSIOLOGY LAB**

BIPN 105 (Spring, 2022)

### **INSTRUCTOR:**

Chris Armour, M.D., Ph.D.

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Office Hours: Mondays 12:00 - 12:50

York Hall 2426

### **INSTRUCTIONAL ASSISTANTS:**

Adam Grizzle

Neil Talwar

Brandon Taylor

Ryan Ghassemi

### **STAFF RESEARCH ASSOCIATE:**

The purpose of this course is to provide experience with some of the experimental methods of physiology, help students obtain a better understanding of the principles of physiology, and learn how to communicate science in a professional manner. This course is a companion to BIPN 100 (and BIPN 100 is a prerequisite).

There are two lectures per week. Some lectures will be live (PCYNH 122 M/W 12:00 - 12:50 p.m.) and some will be pre-recorded (see schedule). Live problem-solving sessions will be held on Fridays (PCYNH 122 12:00 - 12:50). There are also two laboratory sessions per week (York 2426, M/W 1:00 - 5:50 p.m. or Tu/Th 12:30 - 5:20 p.m.).

The experiments will be written up in three lab reports. The first two lab reports will be written individually and each report covers two experiments. The final lab report covers a group project and will be written by the lab group. At the end of the quarter, each lab group will present a short symposium on their project. Homeworks and a comprehensive final will be given.

lab reports:           #1 and #2 - each 20% of course grade  
                              #3 - 15% of course grade (all lab reports must be completed to pass)

All lab reports must be submitted to Turnitin.com in order to receive a grade in this course

symposium:           5% of course grade (participation is required to pass)

final/homeworks:    40% of course grade (the final must be completed to pass)

### **REQUIRED MATERIALS**

- Lab manual (UCSD Bookstore)
- Text: Human Physiology, Silverthorn, 8<sup>th</sup> edition (older edition reading lists are available)
- Schedule/course information/problem sets (Canvas)
- USB flash drive
- Safety glasses

## BIPN 105 SCHEDULE (Spring, 2022)

<u>DATES</u>	<u>ACTIVITY</u>	<u>TOPIC</u>	<u>READING</u> (Lab Manual/Silverthorn 8 <sup>th</sup> ed.)
March 28	Lecture (live)	Biophysical Instrumentation	Introduction
March 28, 29	Lab	Introduction to Instrumentation	#1
March 30	Lecture (live)	RBC Membrane, Osmosis	124-127
March 30, 31	Lab	Properties of RBC Membranes	#2
April 1	Problem Solving (live)	Equipment and RBCs	Problem Set #1
<b>April 4 (Monday)</b>		<b>HMK #1 - RBC Lab (experiment #2) due (York 2426 12:00 - 1:00)</b>	
April 4	Lecture (recorded)	Basis/Propagation of Action Potentials	152-158, 224-249
April 4, 5	Lab	Sciatic Nerve Studies in the Frog	#3
April 6	Lecture (recorded)	Neuromuscular Transmission	249-257
April 6, 7	Lab	Neuromuscular Studies in the Frog	#4
April 8	Problem Solving (live)	Sciatic Nerve and NMJ	Problem Set #2
April 11	Lecture (live)	Lab Reports	
April 11, 12	Lab	Repeat Day	
April 13	Lecture (recorded)	Skeletal Muscle Physiology	376-396
April 13, 14	Lab	Muscle Studies in the Frog	#5
<b>April 18 (Monday)</b>		<b>HMK #2 - Muscle Lab (experiment #5) due (York 2426 12:00 - 1:00)</b>	
April 18	Lecture (recorded)	Smooth Muscle Physiology	400-409
April 18, 19	Lab	Rat Uterus Preparation	#6
<b>April 20 (Wednesday)</b>		<b>Report #1 part 1 (Sciatic Nerve - exp. #3) due (York 2426 12:00 - 1:00)</b>	
April 20	Lecture (recorded)	Cardiac Biomechanics	440-445, 459-471
April 20, 21	Lab	Starling's Law Video	#7
April 22	Problem Solving (live)	Skeletal and Smooth Muscle	Problem Set #3
<b>April 25 (Monday)</b>		<b>Report #1 part 2 (NMJ - exp. #4) due (York 2426 12:00 - 1:00)</b>	
April 25	Lecture (recorded)	Cardiac Electrophysiology	446-459
April 25, 26	Lab	Cardiac Physiology in the Frog	#8
<b>April 27 (Wednesday)</b>		<b>HMK #3 - Uterus Lab (experiment #6) due (York 2426 12:00 - 1:00)</b>	
April 27	Lecture (recorded)	Fluid Balance, Edema, and Blood Flow	477-480, 495-500
April 27, 28	Lab	Hemodynamics in the Frog	#9

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May 2	Lecture (live)	Student Projects Explanation/Sign-ups	
May 2, 3	Lab	Repeat Day	
May 4	Lecture (recorded)	Principles of Electrocardiography	455-459
May 4, 5	Lab	Human Electrocardiogram	#10
May 6	Problem Solving (live)	PV loop, Frog ECG, Fluid Balance	Problem Set #4
May 9	Lecture (recorded)	Non-invasive Cardiac Evaluation	481-483
May 9, 10	Lab	Monitoring Circulation in Humans	#11
<b>May 11 (Wednesday)</b>		<b>Report #2 part 1 (Frog ECG - exp. #8) due (York 2426 12:00 - 1:00)</b>	
<b>May 11, 12 (Wednesday/Thursday)</b>		<b>Discuss Student Projects in Lab - one page summary due</b>	
May 13	Problem Solving (live)	Human ECG, Heart Sounds, Murmurs	Problem Set #5
<b>May 16 (Monday)</b>		<b>Report #2 part 2 (Fluid Balance - exp. #9) due (York 2426 12:00 - 1:00)</b>	
May 16, 17	Lab	Student Projects	#12
May 18, 19	Lab	Student Project Repeat Day #1	
May 23, 24	Lab	Student Project Repeat Day #2	
May 25	Lecture (recorded)	Renal Physiology	131-151, 588-606
May 25, 26	Lab	Human Kidney Function	#13
<b>May 30, 31</b>		<b>Memorial Day Holiday (no lecture or lab)</b>	
<b>June 1, 2</b>		<b>STUDENT SYMPOSIUM (York 2426)</b>	
		<b>Report #3 (Student Project - exp. #12) due at symposium</b>	
June 3	Problem Solving (live)	Kidney and Student Projects	Problem Set #6
<b>Exam Week</b>		<b>FINAL EXAM</b> <b>Wednesday June 8 11:30 – 2:30</b> <b>location: TBA (probably PCYNH 122)</b>	

The schedule and format of this course may change (such as switching to online assignments and/or canceling the final exam) to accommodate COVID-19 restrictions