

HUMAN PHYSIOLOGY LAB

BIPN 105 (Fall, 2023)

INSTRUCTOR:

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

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Office Hours: Mondays 12:00 - 12:50

York Hall 2426

INSTRUCTIONAL ASSISTANTS:

Tim Heil

Mihali Dieguez

Patrick Zaccaria

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 (PODEM 1A19 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 (PODEM 1A19 12:00 - 12:50 p.m.). 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

REQUIRED MATERIALS

- Lab manual (UCSD Bookstore)
- Text: Human Physiology, Silverthorn, 8th edition (digital access available through Canvas)
- Schedule/course information/problem sets (Canvas)
- USB flash drive
- Safety glasses

BIPN 105 SCHEDULE (Fall, 2023)

<u>DATES</u>	<u>ACTIVITY</u>	<u>TOPIC</u>	<u>READING</u> (Lab Manual/Silverthorn 8 th ed.)
Sept. 28	Lab	First Day check-in and then leave	
Sept. 29	No Lecture	No Lecture	
Oct. 2	Lecture (live)	Biophysical Instrumentation	Introduction
Oct. 2, 3	Lab	Introduction to Instrumentation	#1
Oct. 4	Lecture (live)	RBC Membrane, Osmosis	124-127
Oct. 4, 5	Lab	Properties of RBC Membranes	#2
Oct. 6	Problem Solving (live)	Equipment and RBCs	Problem Set #1
Oct. 9 (Monday)		HMK #1 - RBC Lab (experiment #2) due (York 2426 12:00 - 1:00)	
Oct. 9	Lecture (recorded)	Basis/Propagation of Action Potentials	152-158, 224-249
Oct. 9, 10	Lab	Sciatic Nerve Studies in the Frog	#3
Oct. 11	Lecture (recorded)	Neuromuscular Transmission	249-257
Oct. 11, 12	Lab	Neuromuscular Studies in the Frog	#4
Oct. 13	Problem Solving (live)	Sciatic Nerve and NMJ	Problem Set #2
Oct. 16	Lecture (live)	Lab Reports	
Oct. 16, 17	Lab	Repeat Day	
Oct. 18	Lecture (recorded)	Skeletal Muscle Physiology	376-396
Oct. 18, 19	Lab	Muscle Studies in the Frog	#5
Oct. 23 (Monday)		HMK #2 - Muscle Lab (experiment #5) due (York 2426 12:00 - 1:00)	
Oct. 23	Lecture (recorded)	Smooth Muscle Physiology	400-409
Oct. 23, 24	Lab	Rat Uterus Preparation	#6
Oct. 25 (Wednesday)		Report #1 part 1 (Sciatic Nerve - exp. #3) due (York 2426 12:00 - 1:00)	
Oct. 25	Lecture (recorded)	Cardiac Biomechanics	440-445, 459-471
Oct. 25, 26	Lab	Starling's Law Video	#7
Oct. 27	Problem Solving (live)	Skeletal and Smooth Muscle	Problem Set #3
Oct. 30 (Monday)		Report #1 part 2 (NMJ - exp. #4) due (York 2426 12:00 - 1:00)	
Oct. 30	Lecture (recorded)	Cardiac Electrophysiology	446-459
Oct. 30, 31	Lab	Cardiac Physiology in the Frog	#8
Nov. 1 (Wednesday)		HMK #3 - Uterus Lab (experiment #6) due (York 2426 12:00 - 1:00)	
Nov. 1	Lecture (recorded)	Fluid Balance, Edema, and Blood Flow	477-480, 495-500
Nov. 1, 2	Lab	Hemodynamics in the Frog	#9

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<u>DATES</u>	<u>ACTIVITY</u>	<u>TOPIC</u>	<u>READING</u> (Lab Manual/Silverthorn 8 th ed.)
Nov. 6	Lecture (live)	Student Projects Explanation/Sign-ups	
Nov. 6, 7	Lab	Repeat Day	
Nov. 8	Lecture (recorded)	Principles of Electrocardiography	455-459
Nov. 8, 9	Lab	Human Electrocardiogram	#10
Nov. 13	Lecture (recorded)	Non-invasive Cardiac Evaluation	481-483
Nov. 13, 14	Lab	Monitoring Circulation in Humans	#11
Nov. 15 (Wednesday)		Report #2 part 1 (Frog ECG - exp. #8) due (York 2426 12:00 - 1:00)	
Nov. 15, 16 (Wednesday/Thursday)		Discuss Student Projects in Lab - one page summary due	
Nov. 17	Problem Solving (live)	PV loop, Frog ECG, Fluid Balance	Problem Set #4
Nov. 20 (Monday)		Report #2 part 2 (Fluid Balance - exp. #9) due (York 2426 12:00 - 1:00)	
Nov. 20, 21	Lab	Student Projects	#12
Nov. 22, 23		Thanksgiving Holiday (no lecture or lab)	
Nov. 27, 28	Lab	Student Project Repeat Day #1	
Nov. 29, 30	Lab	Student Project Repeat Day #2	
Dec. 1	Problem Solving (live)	Human ECG, Heart Sounds, Murmurs	Problem Set #5
Dec. 4	Lecture (recorded)	Renal Physiology	131-151, 588-606
Dec. 4, 5	Lab	Human Kidney Function	#13
Dec. 6, 7		STUDENT SYMPOSIUM (York 2426)	
		Report #3 (Student Project - exp. #12) due at symposium	
Dec. 8	Problem Solving (live)	Kidney and Student Projects	Problem Set #6
Exam Week		FINAL EXAM Thursday December 14 11:30 – 2:30 location: TBA (probably PODEM 1A19)	

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