HUMAN PHYSIOLOGY LAB

BIPN 105 (Fall, 2022)

INSTRUCTOR: Chris Armour, M.D., Ph.D.
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Office Hours: Mondays 12:00 - 12:50
York Hall 2426

INSTRUCTIONAL ASSISTANTS:

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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

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, 2022)

DATES	ACTIVITY	TOPIC	READING (Lab Manual/Silverthorn 8th ed.)
Sept. 22	Lab	First Day check-in and then leave	
Sept. 23	No Lecture	No Lecture	
Sept. 26	Lecture (live)	Biophysical Instrumentation	Introduction
Sept. 26, 27	Lab	Introduction to Instrumentation	#1
Sept. 28	Lecture (live)	RBC Membrane, Osmosis	124-127
Sept. 28, 29	Lab	Properties of RBC Membranes	#2
Sept. 30	Problem Solving (live)	Equipment and RBCs	Problem Set #1
Oct. 3 (Monday)	**HMK #1 - RBC Lab (experiment #2) due (York 2426 12:00 - 1:00)**		
Oct. 3	Lecture (recorded)	Basis/Propagation of Action Potentials	152-158, 224-249
Oct. 3, 4	Lab	Sciatic Nerve Studies in the Frog	#3
Oct. 5	Lecture (recorded)	Neuromuscular Transmission	249-257
Oct. 5, 6	Lab	Neuromuscular Studies in the Frog	#4
Oct. 7	Problem Solving (live)	Sciatic Nerve and NMJ	Problem Set #2
Oct. 10	Lecture (live)	Lab Reports	
Oct. 10, 11	Lab	Repeat Day	
Oct. 12	Lecture (recorded)	Skeletal Muscle Physiology	376-396
Oct. 12, 13	Lab	Muscle Studies in the Frog	#5
Oct. 17 (Monday)	**HMK #2 - Muscle Lab (experiment #5) due (York 2426 12:00 - 1:00)**		
Oct. 17	Lecture (recorded)	Smooth Muscle Physiology	400-409
Oct. 17, 18	Lab	Rat Uterus Preparation	#6
Oct. 19 (Wednesday)	**Report #1 part 1 (Sciatic Nerve - exp. #3) due (York 2426 12:00 - 1:00)**		
Oct. 19	Lecture (recorded)	Cardiac Biomechanics	440-445, 459-471
Oct. 19, 20	Lab	Starling's Law Video	#7
Oct. 21	Problem Solving (live)	Skeletal and Smooth Muscle	Problem Set #3
Oct. 24 (Monday)	**Report #1 part 2 (NMJ - exp. #4) due (York 2426 12:00 - 1:00)**		
Oct. 24	Lecture (recorded)	Cardiac Electrophysiology	446-459
Oct. 24, 25	Lab	Cardiac Physiology in the Frog	#8
Oct. 26 (Wednesday)	**HMK #3 - Uterus Lab (experiment #6) due (York 2426 12:00 - 1:00)**		
Oct. 26	Lecture (recorded)	Fluid Balance, Edema, and Blood Flow	477-480, 495-500
Oct. 26, 27	Lab	Hemodynamics in the Frog	#9

BIPN 105 SCHEDULE (Fall, 2022)

DATES	ACTIVITY	TOPIC	READING (Lab Manual/Silverthorn 8th ed.)
Oct. 31	Lecture (live)	Student Projects Explanation/Sign-ups	
Oct. 31, Nov. 1	Lab	Repeat Day	
Nov. 2	Lecture (recorded)	Principles of Electrocardiography	455-459
Nov. 2, 3	Lab	Human Electrocardiogram	#10
Nov. 4	Problem Solving (live)	PV loop, Frog ECG, Fluid Balance	Problem Set #4
Nov. 7	Lecture (recorded)	Non-invasive Cardiac Evaluation	481-483
Nov. 7, 8	Lab	Monitoring Circulation in Humans	#11
Nov. 9 (Wednesday)		**Report #2 part 1 (Frog ECG - exp. #8) due (York 2426 12:00 - 1:00)**	
Nov. 9, 10 (Wednesday/Thursday)		**Discuss Student Projects in Lab - one page summary due**	
Nov. 14 (Monday)		**Report #2 part 2 (Fluid Balance - exp. #9) due (York 2426 12:00 - 1:00)**	
Nov. 14, 15	Lab	Student Projects	#12
Nov. 16, 17	Lab	Student Project Repeat Day #1	
Nov. 18	Problem Solving (live)	Human ECG, Heart Sounds, Murmurs	Problem Set #5
Nov. 21, 22	Lab	Student Project Repeat Day #2	
Nov. 23, 24		**Thanksgiving Holiday (no lecture or lab)**	
Nov. 28	Lecture (recorded)	Renal Physiology	131-151, 588-606
Nov. 28, 29	Lab	Human Kidney Function	#13
Nov. 30, Dec. 1		**STUDENT SYMPOSIUM (York 2426)**	
		Report #3 (Student Project - exp. #12) due at symposium	
Dec. 2	Problem Solving (live)	Kidney and Student Projects	Problem Set #6

Exam Week — **FINAL EXAM**
Thursday December 8 11:30 – 2:30
location: TBA (probably PCYNH 122)

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