

HUMAN PHYSIOLOGY LAB

BIPN 105 (Spring, 2023)

INSTRUCTOR:

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

email: carmour@ucsd.edu

Office Hours: Mondays 12:00 - 12:50

York Hall 2426

INSTRUCTIONAL ASSISTANTS:

Darin Cheung

Anna Hakimi

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, 8th edition
- Schedule/course information/problem sets (Canvas)
- USB flash drive
- Safety glasses

BIPN 105 SCHEDULE (Spring, 2023)

<u>DATES</u>	<u>ACTIVITY</u>	<u>TOPIC</u>	<u>READING</u> (Lab Manual/Silverthorn 8 th ed.)
April 3	Lecture (live)	Biophysical Instrumentation	Introduction
April 3, 4	Lab	Introduction to Instrumentation	#1
April 5	Lecture (live)	RBC Membrane, Osmosis	124-127
April 5, 6	Lab	Properties of RBC Membranes	#2
April 7	Problem Solving (live)	Equipment and RBCs	Problem Set #1
April 10 (Monday) HMK #1 - RBC Lab (experiment #2) due (York 2426 12:00 - 1:00)			
April 10	Lecture (recorded)	Basis/Propagation of Action Potentials	152-158, 224-249
April 10, 11	Lab	Sciatic Nerve Studies in the Frog	#3
April 12	Lecture (recorded)	Neuromuscular Transmission	249-257
April 12, 13	Lab	Neuromuscular Studies in the Frog	#4
April 14	Problem Solving (live)	Sciatic Nerve and NMJ	Problem Set #2
April 17	Lecture (live)	Lab Reports	
April 17, 18	Lab	Repeat Day	
April 19	Lecture (recorded)	Skeletal Muscle Physiology	376-396
April 19, 20	Lab	Muscle Studies in the Frog	#5
April 24 (Monday) HMK #2 - Muscle Lab (experiment #5) due (York 2426 12:00 - 1:00)			
April 24	Lecture (recorded)	Smooth Muscle Physiology	400-409
April 24, 25	Lab	Rat Uterus Preparation	#6
April 26 (Wednesday) Report #1 part 1 (Sciatic Nerve - exp. #3) due (York 2426 12:00 - 1:00)			
April 26	Lecture (recorded)	Cardiac Biomechanics	440-445, 459-471
April 26, 27	Lab	Starling's Law Video	#7
April 28	Problem Solving (live)	Skeletal and Smooth Muscle	Problem Set #3
May 1 (Monday) Report #1 part 2 (NMJ - exp. #4) due (York 2426 12:00 - 1:00)			
May 1	Lecture (recorded)	Cardiac Electrophysiology	446-459
May 1, 2	Lab	Cardiac Physiology in the Frog	#8
May 3 (Wednesday) HMK #3 - Uterus Lab (experiment #6) due (York 2426 12:00 - 1:00)			
May 3	Lecture (recorded)	Fluid Balance, Edema, and Blood Flow	477-480, 495-500
May 3, 4	Lab	Hemodynamics in the Frog	#9

BIPN 105 SCHEDULE (Spring, 2023)

<u>DATES</u>	<u>ACTIVITY</u>	<u>TOPIC</u>	<u>READING</u> (Lab Manual/Silverthorn 8 th ed.)
May 8	Lecture (live)	Student Projects Explanation/Sign-ups	
May 8, 9	Lab	Repeat Day	
May 10	Lecture (recorded)	Principles of Electrocardiography	455-459
May 10, 11	Lab	Human Electrocardiogram	#10
May 12	Problem Solving (live)	PV loop, Frog ECG, Fluid Balance	Problem Set #4
May 15	Lecture (recorded)	Non-invasive Cardiac Evaluation	481-483
May 15, 16	Lab	Monitoring Circulation in Humans	#11
May 17 (Wednesday)		Report #2 part 1 (Frog ECG - exp. #8) due (York 2426 12:00 - 1:00)	
May 17, 18 (Wednesday/Thursday)		Discuss Student Projects in Lab - one page summary due	
May 19	Problem Solving (live)	Human ECG, Heart Sounds, Murmurs	Problem Set #5
May 22 (Monday)		Report #2 part 2 (Fluid Balance - exp. #9) due (York 2426 12:00 - 1:00)	
May 22, 23	Lab	Student Projects	#12
May 24, 25	Lab	Student Project Repeat Day #1	
May 29, 30		Memorial Day Holiday (no lecture or lab)	
May 31, June 1	Lab	Student Project Repeat Day #2	
June 5	Lecture (recorded)	Renal Physiology	131-151, 588-606
June 5, 6	Lab	Human Kidney Function	#13
June 7, 8		STUDENT SYMPOSIUM (York 2426)	
		Report #3 (Student Project - exp. #12) due at symposium	
June 3	Problem Solving (live)	Kidney and Student Projects	Problem Set #6
Exam Week		FINAL EXAM Wednesday June 14 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