

ANIMAL PHYSIOLOGY LAB
BIPN 105 (Winter, 2017)

INSTRUCTOR:

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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 will be three lectures (CSB 005, M/W/F 3:00 - 3:50 p.m.) and two laboratory sessions (York 2410/2432, Tu/TH 9:00 - 1:50 p.m.) per week. 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 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)
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, 7th edition (6th, 5th, and 4th edition reading lists are also provided)
- Syllabus/course information/problem sets (TritonEd)
- USB flash drive
- Safety glasses

BIPN 105 SCHEDULE (Winter, 2017)

<u>DATES</u>	<u>ACTIVITY</u>	<u>TOPIC</u>	<u>READING</u> (Lab Manual/Silverthorn 7 th ed.)
Jan. 9	Lecture	Biophysical Instrumentation	Introduction
Jan. 10	Lab	Introduction to Instrumentation	#1
Jan. 11	Lecture	RBC Membrane, Osmosis	125-129
Jan. 12	Lab	Properties of RBC Membranes	#2
Jan. 13	Problem Solving	Equipment and RBCs	Problem Set #1
Jan. 16, 17		MLK Holiday (no lecture or lab)	
Jan. 18 (Wednesday)		RBC Membrane Homework due in lecture (experiment #2)	
Jan. 18	Lecture	Basis/Propagation of Action Potentials	153-158, 227-252
Jan. 19	Lab	Sciatic Nerve Studies in the Frog	#3
Jan. 23	Lecture	Neuromuscular Transmission	252-259
Jan. 24	Lab	Neuromuscular Studies in the Frog	#4
Jan. 25	Lecture	Lab Reports	
Jan. 26	Lab	Repeat Day	
Jan. 27	Problem Solving	Sciatic Nerve and NMJ	Problem Set #2
Jan. 30	Lecture	Muscle Mechanics	378-399
Jan. 31	Lab	Muscle Studies in the Frog	#5
Feb. 1 (Wednesday)		Report #1 part 1 (Sciatic Nerve - exp. #3). <u>Turn it in lecture</u>	
Feb. 1	Lecture	Smooth Muscle Physiology	403-411
Feb. 2	Lab	Rat Uterus Preparation	#6
Feb. 3	Problem Solving	Skeletal and Smooth Muscle	Problem Set #3
Feb. 6 (Monday)		Skeletal Muscle Homework (experiment #5) due in lecture	
Feb. 6 (Monday)		Report #1 part 2 (NMJ - exp. #4). <u>Turn it in lecture</u>	
Feb. 6	Lecture	Cardiac Biomechanics	443-447, 461-472
Feb. 7	Lab	Starling's Law Video	#7
Feb. 8	Lecture	Cardiac Electrophysiology	447-461
Feb. 9	Lab	Cardiac Physiology in the Frog	#8

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February 13 (Monday)		Smooth Muscle Homework due (experiment #6) due in lecture	
Feb. 13	Lecture	Fluid Balance, Edema, and Blood Flow	478-481, 496-501
Feb. 14	Lab	Hemodynamics in the Frog	#9
Feb. 15	Lecture	Student Projects Explanation/Sign-ups	
Feb. 16	Lab	Repeat Day	
Feb. 20, 21		President's Day Holiday (no lecture or lab)	
Feb. 22 (Wednesday)		Report #2 part 1 (Frog ECG - exp. #8) due. <u>Turn it in lecture</u>	
Feb. 22	Lecture	Principles of Electrocardiography	457-461
Feb. 23	Lab	Human Electrocardiogram	#10
Feb. 24	Problem Solving	PV loop, Frog ECG, Fluid Balance	Problem Set #4
Feb. 27 (Monday)		Report #2 part 2 (Fluid Balance - exp. #9) due. <u>Turn it in lecture</u>	
Feb. 27	Lecture	Non-invasive Cardiac Evaluation	482-486
Feb. 28	Lab	Monitoring Circulation in Humans	#11
Feb. 27, 28		Discuss Student Projects in Lab - one page summary due	
March 2	Lab	Student Projects	#12
March 7	Lab	Student Project Repeat Day #1	
March 9	Lab	Student Project Repeat Day #2	
March 10	Problem Solving	Human ECG, Heart Sounds, Murmurs	Problem Set #5
March 13	Lecture	Renal Physiology	132-152, 590-608
March 14	Lab	Human Kidney Function	#13
March 16		STUDENT SYMPOSIUM	
		Report #3 (Student Project - exp. #12) due at symposium	
March 17	Problem Solving	Kidney and Student Projects	Problem Set #6
Exam Week		FINAL EXAM	
		Wednesday March 22 3:00 – 5:59 pm	