

ANIMAL PHYSIOLOGY LAB

BIPN 105 (Winter, 2015)

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 (Center Hall 214, M/W/F 12:00 - 12:50 p.m.) and two laboratory sessions (York 2426, M/W 1:00 - 6:00 p.m. or Tu/Th 12:30 - 5:30 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 from Soft Reserves, Student Center
- Packet of problem sets, sample lab report, grading criteria, etc. from Soft Reserves, Student Center
- Text: Human Physiology, Silverthorn, 6th edition (5th and 4th edition reading lists are also provided)
- USB flash drive
- Safety glasses

BIPN 105 SCHEDULE (Winter, 2015)

<u>DATES</u>	<u>ACTIVITY</u>	<u>TOPIC</u>	<u>READING</u> (Lab Manual/Silverthorn 6 th ed.)
January 5	Lecture	Biophysical Instrumentation	Introduction
January 5, 6	Lab	Introduction to Instrumentation	#1
January 7	Lecture	RBC Membrane, Osmosis	132-135
January 7, 8	Lab	Properties of RBC Membranes	#2
January 9	Problem Solving	Equipment and RBCs	Problem Set #1
January 12 (Monday)		RBC Membrane Homework due (experiment #2)	
January 12	Lecture	Basis/Propagation of Action Potentials	160-166, 239-266
January 12, 13	Lab	Sciatic Nerve Studies in the Frog	#3
January 14	Lecture	Neuromuscular Transmission	266-273
January 14, 15	Lab	Neuromuscular Studies in the Frog	#4
January 19, 20		MLK Holiday (no lecture or lab)	
January 21	Lecture	Lab Reports	
January 21, 22	Lab	Repeat Day	
January 23	Problem Solving	Sciatic Nerve and NMJ	Problem Set #2
January 26	Lecture	Muscle Mechanics	399-421
January 26, 27	Lab	Muscle Studies in the Frog	#5
January 28 (Wednesday)		Report #1 part 1 (Sciatic Nerve - exp. #3) due in lecture	
January 28	Lecture	Smooth Muscle Physiology	427-434
January 28, 29	Lab	Rat Uterus Preparation	#6
January 30	Problem Solving	Skeletal and Smooth Muscle	Problem Set #3
February 2 (Monday)		Report #1 part 2 (NMJ - exp. #4) due in lecture	
February 2	Lecture	Cardiac Biomechanics	471-474, 487-501
February 2, 3	Lab	Starling's Law Video	#7
February 4 (Wednesday)		Skeletal Muscle Homework due (experiment #5)	
February 4	Lecture	Cardiac Electrophysiology	475-487
February 4, 5	Lab	Cardiac Physiology in the Frog	#8

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February 9 (Monday)		Smooth Muscle Homework due (experiment #6)	
February 9	Lecture	Fluid Balance, Edema, and Blood Flow	509-512, 528-533
February 9, 10	Lab	Hemodynamics in the Frog	#9
February 11	Lecture	Student Projects Explanation/Sign-ups	
February 11, 12	Lab	Repeat Day	
February 16, 17		President's Day Holiday (no lecture or lab)	
February 18 (Wednesday)		Report #2 part 1 (Frog ECG - exp. #8) due in lecture	
February 18	Lecture	Principles of Electrocardiography	846-490
February 18, 19	Lab	Human Electrocardiogram	#10
February 20	Problem Solving	PV loop, Frog ECG, Fluid Balance	Problem Set #4
February 23 (Monday)		Report #2 part 2 (Fluid Balance - exp. #9) due in lecture	
February 23	Lecture	Non-invasive Cardiac Evaluation	513-518
February 23, 24	Lab	Monitoring Circulation in Humans	#11
February 23, 24 (Monday/Tuesday)		Discuss Student Projects during lab - one page summary due	
February 25, 26	Lab	Student Projects	#12
February 27	Problem Solving	Human ECG, Heart Sounds, Murmurs	Problem Set #5
March 2, 3	Lab	Student Projects Repeat Day #1	
March 4, 5	Lab	Student Project Repeat Day #2	
March 9	Lecture	Renal Physiology	139-160, 627-646
March 9, 10	Lab	Human Kidney Function	#13
March 11, 12		STUDENT SYMPOSIUM	
		Report #3 (Student Project - exp. #12) due at symposium	
March 13	Problem Solving	Kidney and Student Projects	Problem Set #6
Exam Week		FINAL EXAM	
		Wednesday March 18	
		11:30 a.m. - 2:30 p.m.	