

ANIMAL PHYSIOLOGY LAB

BIPN 105 (Spring, 2018)

INSTRUCTOR:

Chris Armour, M.D., Ph.D.
YORK 4070D phone: (858) 534-8571
email: carmour@ucsd.edu
office hours: Tuesdays 2:00 p.m. - 2:50 p.m.

INSTRUCTIONAL ASSISTANTS:

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| Susie Wang | Patrick Zaccaria |
| Billy Nguyen | Matt Chan |

STAFF RESEARCH ASSOCIATE:

Andres Herrera
phone: (858) 534-6242
email: a2herrera@ucsd.edu

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 (Solis Hall 104, M/W/F 12:00 - 12:50 p.m.) and two laboratory sessions (York 2426, M/W 1:00 - 5:50 p.m. or Tu/Th 3:00 - 7:50 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)

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, 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 (Spring, 2018)

| <u>DATES</u> | <u>ACTIVITY</u> | <u>TOPIC</u> | <u>READING</u> (Lab Manual/Silverthorn 7 th ed.) |
|--|-----------------|--|--|
| April 2 | Lecture | Biophysical Instrumentation | Introduction |
| April 2, 3 | Lab | Introduction to Instrumentation | #1 |
| April 4 | Lecture | RBC Membrane, Osmosis | 125-129 |
| April 4, 5 | Lab | Properties of RBC Membranes | #2 |
| April 6 | Problem Solving | Equipment and RBCs | Problem Set #1 |
| April 9 (Monday) RBC Membrane Homework (experiment #2) due in lecture | | | |
| April 9 | Lecture | Basis/Propagation of Action Potentials | 153-158, 227-252 |
| April 9, 10 | Lab | Sciatic Nerve Studies in the Frog | #3 |
| April 11 | Lecture | Neuromuscular Transmission | 252-259 |
| April 11, 12 | Lab | Neuromuscular Studies in the Frog | #4 |
| April 13 | Problem Solving | Sciatic Nerve and NMJ | Problem Set #2 |
| April 16 | Lecture | Lab Reports | |
| April 16, 17 | Lab | Repeat Day | |
| April 18 | Lecture | Muscle Mechanics | 378-399 |
| April 18, 19 | Lab | Muscle Studies in the Frog | #5 |
| April 23 (Monday) Skeletal Muscle Homework (experiment #5) due in lecture | | | |
| April 23 | Lecture | Smooth Muscle Physiology | 403-411 |
| April 23, 24 | Lab | Rat Uterus Preparation | #6 |
| April 25 (Wednesday) Report #1 part 1 (Sciatic Nerve - exp. #3) due | | | |
| <u>Turn it in at the lab before noon</u> | | | |
| April 25 | Lecture | Cardiac Biomechanics | 443-447, 461-472 |
| April 25, 26 | Lab | Starling's Law Video | #7 |
| April 27 | Problem Solving | Skeletal and Smooth Muscle | Problem Set #3 |
| April 30 (Monday) Report #1 part 2 (NMJ - exp. #4) due | | | |
| <u>Turn it in at the lab before noon</u> | | | |
| April 30 | Lecture | Cardiac Electrophysiology | 447-461 |
| April 30/May 1 | Lab | Cardiac Physiology in the Frog | #8 |
| May 2 (Wednesday) Smooth Muscle Homework (experiment #6) due in lecture | | | |
| May 2 | Lecture | Fluid Balance, Edema, and Blood Flow | 478-481, 496-501 |
| May 2, 3 | Lab | Hemodynamics in the Frog | #9 |

BIPN 105 SCHEDULE (Spring, 2018)

| <u>DATES</u> | <u>ACTIVITY</u> | <u>TOPIC</u> | <u>READING</u> (Lab Manual/Silverthorn 7 th ed.) |
|--|-----------------------|--|--|
| May 7 | Lecture | Student Projects Explanation/Sign-ups | |
| May 7, 8 | Lab | Repeat Day | |
| May 9 | Lecture | Principles of Electrocardiography | 457-461 |
| May 9, 10 | Lab | Human Electrocardiogram | #10 |
| May 11 | Problem Solving | PV loop, Frog ECG, Fluid Balance | Problem Set #4 |
| May 14 | Lecture | Non-invasive Cardiac Evaluation | 482-486 |
| May 14, 15 | Lab | Monitoring Circulation in Humans | #11 |
| May 16 (Wednesday) | | Report #2 part 1 (Frog ECG - exp. #8) due <u>Turn it in at the lab before noon</u> | |
| May 16, 17 (Wednesday/Thursday) | | Discuss Student Projects in lab - one page summary due | |
| May 18 | Problem Solving | Human ECG, Heart Sounds, Murmurs | Problem Set #5 |
| May 21 (Monday) | | Report #2 part 2 (Fluid Balance - exp. #9) due <u>Turn it in at the lab before noon</u> | |
| May 21, 22 | Lab | Student Projects | #12 |
| May 23, 24 | Lab | Student Project Repeat Day #1 | |
| May 28, 29 | No lecture/lab | MEMORIAL DAY | |
| May 30, 31 | Lab | Student Project Repeat Day #2 | |
| June 4 | Lecture | Renal Physiology | 132-152, 590-608 |
| June 4, 5 | Lab | Human Kidney Function | #13 |
| June 6, 7 | | STUDENT SYMPOSIUM Report #3 (Student Project - exp. #12) due at symposium | |
| June 8 | Problem Solving | Kidney and Student Projects | Problem Set #6 |
| Exam Week | | FINAL EXAM Wednesday June 13 11:30 a.m. - 2:30 p.m. | |