# ANIMAL PHYSIOLOGY LAB

BIPN 105 (Spring, 2014)

**INSTRUCTOR:** Chris Armour, M.D., Ph.D.
YORK 4070D phone: (858) 534-8571
email: carmour@ucsd.edu
office hours: Thursdays 11:30 a.m. - 12:30 p.m.

**TEACHING ASSISTANTS:**

Michael Cheng
Leon Tejwani
Patrick Zaccaria
Anelah McGinness

**STAFF RESEARCH ASSOCIATE:** Dennis Hickey
phone: (858) 534-6242
email: dhickey@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 (Center 212, 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.

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| 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 (Spring, 2014)

| DATES | ACTIVITY | TOPIC | READING (Lab Manual/Silverthorn 6th ed.) |
|---|---|---|---|
| March 31 | Lecture | Biophysical Instrumentation | Introduction |
| March 31/April 1 | Lab | Introduction to Instrumentation | #1 |
| April 2 | Lecture | RBC Membrane, Osmosis | 132-135 |
| April 2, 3 | Lab | Properties of RBC Membranes | #2 |
| April 4 | Problem Solving | Equipment and RBCs | Problem Set #1 |
| **April 7 (Monday)** | | **RBC Membrane Homework due (experiment #2)** | |
| April 7 | Lecture | Basis/Propagation of Action Potentials | 160-166, 239-266 |
| April 7, 8 | Lab | Sciatic Nerve Studies in the Frog | #3 |
| April 9 | Lecture | Neuromuscular Transmission | 266-273 |
| April 9, 10 | Lab | Neuromuscular Studies in the Frog | #4 |
| April 14 | Lecture | Lab Reports | |
| April 14, 15 | Lab | Repeat Day | |
| April 16 | Lecture | Muscle Mechanics | 399-421 |
| April 16, 17 | Lab | Muscle Studies in the Frog | #5 |
| April 18 | Problem Solving | Sciatic Nerve and NMJ | Problem Set #2 |
| **April 21 (Monday)** | | **Skeletal Muscle Homework due (experiment #5)** | |
| April 21 | Lecture | Smooth Muscle Physiology | 427-434 |
| April 21, 22 | Lab | Rat Uterus Preparation | #6 |
| **April 23 (Wednesday)** | | **Report #1 part 1 (Sciatic Nerve - exp. #3) due in lecture** | |
| April 23 | Lecture | Cardiac Biomechanics | 471-474, 487-501 |
| April 23, 24 | Lab | Starling's Law Video | #7 |
| April 25 | Problem Solving | Skeletal and Smooth Muscle | Problem Set #3 |
| **April 28 (Monday)** | | **Report #1 part 2 (NMJ - exp. #4) due in lecture** | |
| April 28 | Lecture | Cardiac Electrophysiology | 475-487 |
| April 28, 29 | Lab | Cardiac Physiology in the Frog | #8 |
| **April 30 (Wednesday)** | | **Smooth Muscle Homework due (experiment #6)** | |
| April 30 | Lecture | Fluid Balance, Edema, and Blood Flow | 509-512, 528-533 |
| April 30/May 1 | Lab | Hemodynamics in the Frog | #9 |

**BIPN 105 SCHEDULE (Spring, 2014)**

| DATES | ACTIVITY | TOPIC | READING (Lab Manual/Silverthorn 6th ed.) |
|---|---|---|---|
| May 5 | Lecture | Student Projects Explanation/Sign-ups | |
| May 5, 6 | Lab | Repeat Day | |
| May 7 | Lecture | Principles of Electrocardiography | 846-490 |
| May 7, 8 | Lab | Human Electrocardiogram | #10 |
| May 9 | Problem Solving | PV loop, Frog ECG, Fluid Balance | Problem Set #4 |
| May 12 | Lecture | Non-invasive Cardiac Evaluation | 513-518 |
| May 12, 13 | Lab | Monitoring Circulation in Humans | #11 |
| **May 14 (Wednesday)** | | **Report #2 part 1 (Frog ECG - exp. #8) due** | |
| | | **Turn it in at the lab between 12:00 and 1:00 p.m. (there is no lecture)** | |
| **May 14, 15** | | **Discuss Student Projects in lab - one page summary due** | |
| **May 19 (Monday)** | | **Report #2 part 2 (Fluid Balance - exp. #9) due** | |
| | | **Turn it in at the lab between 12:00 and 1:00 p.m. (there is no lecture)** | |
| May 19, 20 | Lab | Student Projects | #12 |
| May 21, 22 | Lab | Student Project Repeat Day #1 | |
| May 23 | Problem Solving | Human ECG, Heart Sounds, Murmurs | Problem Set #5 |
| **May 26, 27 (Monday/Tuesday)** | | **Memorial Day Holiday (no lecture or lab)** | |
| May 28, 29 | Lab | Student Project Repeat Day #2 | |
| June 2 | Lecture | Renal Physiology | 139-160, 627-646 |
| June 2, 3 | Lab | Human Kidney Function | #13 |
| **June 4, 5** | | **STUDENT SYMPOSIUM** | |
| | | **Report #3 (Student Project - exp. #12) due at symposium** | |
| June 6 | Problem Solving | Kidney and Student Projects | Problem Set #6 |

**Exam Week** **FINAL EXAM**
**Wednesday June 11**
**11:30 a.m. - 2:30 p.m.**