BIO 404 Schedule 2015

WEEK 1 Passive Properties of The Neuronal Membrane: Resting
9:10-10:00 Lecture #1: The fast and tiny world of neurophysiology: A sense of scale
10:00-10:30 Lecture #2: Modeling neurons as membrane compartments
10:30-11:00 Hands-on: Intro to computer simulation: The membrane
11:00-12:00 Break
12:00-1:00 Lecture #3: Multicompartent model and equilibrium potentials
1:00-2:00 Lecture #4: Electrodes, amplifiers and multimeters
2:00-6:00 Hands-on: Computer Sim 1 and Electronic Sim 1: Resting potential

Read pp. 1-18 of lab manual and the papers listed on p. 13. Answer questions 1-4 (Homework 1).

WEEK 2 Active Properties of the Neuronal Membrane: Responding
9:10-10:30 Lecture #5: The Action potential, synaptic potentials
10:30-12:00 Lecture #6: Oscilloscopes, stimulators and sample rates
12:00-6:00 Hands-on: Computer Sim 2 and Electronic Sim 2: Action potential

Answer questions 5-6 (Homework 1).

WEEK 3 Experiment I
9:10-4:00 Turn in Homework 1 and Data Collection Plan 1
Record from electric fish
4:15-5:30 Quiz

Answer questions in the lab manual (Homework 2)

WEEK 4 Experiment II
9:10-5:00 Turn in Data Collection Plan 2
Record from the frog sciatic nerve
5:00-6:00 Lab practical

Answer questions in the lab manual (Homework 3)

WEEKS 5-13 Experiments IV-VI
9:10-6:00 Record neural responses in crayfish, horseshoe crabs, rats and humans
Syllabus

Labs meet in Rebstock 112, **Tuesdays** 9:10 a.m.-6:00 p.m.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Rotation</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<th>E</th>
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<th>Assignments due</th>
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<tbody>
<tr>
<td>1</td>
<td>Aug. 25</td>
<td>Lectures &amp; Demos</td>
<td>Membranes and instruments: Measuring passive properties of neurons (details on p. 70)</td>
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<td>Sep. 1</td>
<td>Lectures &amp; Demos</td>
<td>Cells, circuits and instruments: Measuring active properties of neurons</td>
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<td>Experiment I: Electric fish</td>
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All course materials are available through Blackboard

**Individual assignments**
1. Data Collection Plans 1-6 (10 points each)  60 points
2. Homework 1 (Questions 1-6)  25
3. Quiz  20
4. Lab practical  90
5. Homework 2—Figures and legends from Expt. I (Electric Fish)  50
6. Homework 3—Figures and legends from Expt. II (Frog Sciatic)  100
7. Peer reviews 1-2 (75 points each)  150
8. First authorship  30
9. Effort  25

**Team assignments**
1. Manuscript Drafts 1-3 (50 points each)  150
2. Manuscripts 1-3 (100 points each)  300
Total  1000