Honors Neurophysiology  
Neuroscience NROSCI 1018  
Spring Term, 2017 (2174)

Instructor:

Debra Artim, Ph.D.  
Department of Neuroscience  
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Office hours: Monday 3:00 – 4:00 PM; Tuesday, 1:00 – 2:00 PM, Wednesday 10:00 – 11:00AM or by appointment. If you are unavailable during regular office hours, please feel free to make an appointment. The best way to make an appointment is via e-mail.

Lecture:

Tuesday and Thursday, 1:00 – 2:15 PM, 241 Crawford Hall  
Friday, 10:00 – 10:50 AM, A214 Langley Hall

Recitation:

Monday, 10:00 – 10:50 PM, 160 Crawford Hall, begins January 11, 2016

Textbooks (recommended and encouraged):

Main textbook: From Neuron to Brain, 5th ed., Nicholls, Martin, Fuchs, Brown, Diamond, Weisblat (NtoB)  
Supplemental textbook: Cellular Physiology of Nerve and Muscle, 4th ed., Matthews

Both of the above textbooks are available in the book center.

Course website: courseweb.pitt.edu  
Check here for announcements, handouts, grades, practice problems, and useful links. Lecture handouts will generally be posted on the class CourseWeb site the day prior to lecture. There is also an online discussion board for the course. Please feel free to post (or answer!) questions or comments regarding the material.

Course Description:

In this course we will examine the functioning of neurons and synapses, the basic units responsible for fast communication within the nervous system. The course will focus on the elegant use of electrical mechanisms by the nervous system, and on the powerful quantitative approach to scientific investigation that is fundamental to neurophysiology. Topics that will be addressed include: principles of electric current flow exploited by the nervous system; the basis of the resting potential of neurons; the structure and function of voltage-gated and neurotransmitter-gated ion channels; generation and propagation of action potentials; the physiology of fast synaptic communication. The honors component of the course involves the use of computer modeling to simulate electrophysiology experiments allowing students the opportunity to formulate, test and refine hypotheses related to course content. Additionally, students will learn to read the primary literature and will make one journal-club like presentation.
during the recitation hour.

**Academic Integrity:**

Please refer to the School of Arts and Sciences web page for details on academic integrity: [http://www.as.pitt.edu/faculty/policy/integrity.html](http://www.as.pitt.edu/faculty/policy/integrity.html)

Please note that I will follow the School of Arts and Sciences policy of academic integrity. Any violations will be documented and reported to the dean’s office.

**Disabilities and Special Needs:**

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 216 William Pitt Union, 412-648-7890 or 412-383-7355 (TTY) as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course. Please go to the Student Affairs website at [http://www.drs.pitt.edu/](http://www.drs.pitt.edu/) for more information.

**Statement on Classroom Recording:** To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student’s own private use.

**Assignments and Grading:**

**Grading Scale**

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage Range</th>
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<tbody>
<tr>
<td>A+</td>
<td>98.0-100</td>
<td>C+</td>
<td>78.0-79.9</td>
</tr>
<tr>
<td>A</td>
<td>93.0-97.9</td>
<td>C</td>
<td>72.0-77.9</td>
</tr>
<tr>
<td>A-</td>
<td>90.0-92.9</td>
<td>C-</td>
<td>70.0-71.9</td>
</tr>
<tr>
<td>B+</td>
<td>88.0-89.9</td>
<td>D</td>
<td>60.0-69.9</td>
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<tr>
<td>B</td>
<td>82.0-87.9</td>
<td>F</td>
<td>Below 60</td>
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<tr>
<td>B-</td>
<td>80.0-81.9</td>
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**Final grade Determination**

15% for graded problem sets (3 sets of equal weight)
15% for Exam 1
15% for Exam 2
15% for Exam 3
15% for Exam 4
15% Computer simulations / homework
10% Journal club presentation

**Exams:**

There will be 3 unit exams covering the first 3 ‘blocks’ of material. Exams will focus on material presented in class and assigned readings. These exams are not explicitly cumulative, although much of the later course material will depend on the information presented earlier in
the course. The 4th exam will occur during final exam week, it will focus on the last block of material presented in class and will also include questions that are more comprehensive in nature.

Exams will focus on material presented in class and on lecture notes and will be a combination of short answer / essay and problem solving. (no multiple choice in neurophysiology!)

**Lectures:** As described above, all exams will focus on material presented in class and on the lecture notes. All power point slides / figures used in class will be available on courseweb. Additionally, I will post lecture outlines / summaries online before / after class. These outlines are NOT intended to be comprehensive and will not include every word spoken in class! While much of the course material is covered in the textbook readings, a good amount of content will come from other sources in order to bring the best resources to the classroom. Additionally, I will solve example problems in class, and students will work alone or in small groups to solve some practice problems. For all of these reasons, I strongly encourage class attendance, and be sure to bring your calculator! It’s also a great idea to form study groups to get notes from a colleague in the event you do miss class.

**Make-up exams:**
Make-up exams will only be given for extreme circumstances and must be documented. Any student with acceptable exam conflicts (e.g. University-related competitions, grad / med school interviews, research conference, scheduled surgery) must discuss with Dr. Artim AT LEAST ONE WEEK BEFORE the exam and proper documentation must be provided. Students MUST contact Dr. Artim before the exam in order to be eligible for a make-up examination. Otherwise, any student missing an examination will receive 0 points for that exam.

**Materials permitted during examinations**

(1) ONE page of notes (double-sided) is permitted for each exam. No textbook or photocopied pages are allowed. The pages must be either hand-written or typed (at least 11 point font) and printed by the student. This policy is to encourage understanding or the material and problem solving rather than rote memorization of formulae.

(2) A calculator is required for solving some exam problems. Devices with capabilities beyond calculators, such as computers, tablets or PDAs are not permitted during exams.

**Graded Problem Sets**

There will be 3 Graded Problem Sets (GPS) designed to provide students with experience in solving problems. These problem sets are essential to the learning and application of class material. You are encouraged to work in study groups to discuss approaches to solving problem sets. However, you must complete the solutions to the graded problem sets independently.

The dates when problems sets will be given out and due dates are listed below. Problem sets will NOT be accepted late. Problem sets can be submitted in class on the date due, or to the Department of Neuroscience Main Office (A210 Langley Hall) by 4:00 PM on the due date.

**No points will be awarded for problem sets received after 4:00 PM on the due date**
<table>
<thead>
<tr>
<th>Problem set #</th>
<th>Date Given Out</th>
<th>Date Due</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan. 14\textsuperscript{th}</td>
<td>Jan 26\textsuperscript{th}</td>
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<tr>
<td>2</td>
<td>Feb. 9\textsuperscript{th}</td>
<td>Feb 18\textsuperscript{th}</td>
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<td>3</td>
<td>March 3\textsuperscript{rd}</td>
<td>March 22\textsuperscript{nd}</td>
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**Neurophysiology 2018**

This is the graduate section of the course. Students attend the same lectures, complete same problem sets and take same exams as undergraduate students. Graduate students have supplementary requirements. Please speak with Dr. Artim for further details on options to complete these requirements.