**Course:** Bi 463/563 Sensory Physiology, Spring 2015

**Meeting time:** Tu/Th, 8:00 – 9:50, Cramer 221

**Course Web site:** http://web.pdx.edu/~zelickr/sensory-physiology/

This course will be a technical look at how sensory systems work. It will cover invertebrates and vertebrates and most sensory systems, even some obscure ones.

The organization of the course will be somewhat different from the traditional style. To the extent possible, I am experimenting with the idea that this is “your” course instead of “my” course. The first 5 – 7 weeks will be lectures and small group discussion. These will be standard zelick lectures covering many topics in sensory biology in a logical sequence. Following this, we will return to the same topics in the same order, but this time there will be either student-led discussion and presentations or presentation by zelick of student-generated project material.

Here are the possible projects:

1. There is a homebrew textbook cobbled together over many years. It needs improvement everywhere! To do this job requires learning the LaTex text editing software and good organizational and writing skills.

   A) The book is in desperate need of editing. The within-chapter organization, quality of writing and extent of coverage is highly variable.

   B) There are many topics not covered in the textbook. So an entire new chapter or portion of a chapter can be added.

   C) Many chapters of the homebrew textbook have swiped graphics or poor graphics. Someone with good artistic skill could generate new images.

2. The Powerpoint lecture notes for the course are of variable quality and do not cover all topics. One or more of these can be upgraded as a project. As for the textbook, there are many swiped graphics that could be reworked. The student who makes the new or upgraded powerpoint would present it to the class, or I would do this (if you are shy!).
3. A new or existing topic can be augmented with a video / computer
   graphic production. For example, an animation showing some
   sensory process. Not surprisingly, the visual system and visual illusions
   are a good target of opportunity for such a project, but sound and
   the auditory system are pretty good too.

4. A physical / mechanical model that illustrates a principle of sensory
   biology can be constructed. This would probably be like a physics
   lab in optics or mechanics, but tuned for sensory systems. For
   example, imagine a class demonstration using a gizmo to show a
   cochlear travelling wave

5. A good review of the most recent scientific literature on a topic in
   sensory biology can be made and then presented to the class. This
   can be in the form of a powerpoint mini lecture (or full lecture, for
   that matter) or you can lead a class discussion on a set of papers.

Given the variety of options, it is challenging to come up with a method to
evaluate everyone. Suppose you do a great job making a new
powerpoint lecture, but then never show up to any lectures! Or suppose
you show up and participate in the class, but for your project muddle
through a couple of lame scientific papers in a class discussion. Here is my
idea to deal with this:

1. We will have peer review of the projects. For each presentation, the
   other students will rate the difficulty, quantity and quality of the
   work. You get credit for doing the review, which means you have to
   show up and be engaged.

2. The two-hour lecture period is long for keeping attention, especially
   with detailed technical information. After the first hour we'll have a
   break and then a small group discussion of the material. The small
   group comments, views, opinions will then be shared and discussed
   in the 2nd hour. Part of the small group discussion will be to write a
   few comments about the lecture. This is a way to keep track of who
   shows up. You will get credit for showing up!

3. There will be an exam, probably take-home, after the first set of
   zelick lectures. This way everyone will have to know something
   about the variety of topics in sensory biology and not just be
   knowledgeable about your particular project.

4. After the peer review of your project, you will be able to make
   corrections or additions before submitting the final version. Suppose
you get good reviews, but the consensus is that you did way too little work for this part of your grade. You can make good use of this constructive criticism and supplement the project to ensure a good score.

The points breakdown for grading will be something like this:

- 50% lecture exam week 5 – 7
- 40% project
- 10% class participation
Lecture Topics for the first 5 – 7 weeks:

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<thead>
<tr>
<th>Topic</th>
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<tr>
<td>concepts</td>
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<td>mechanosense 1 (bacteria to hair cells)</td>
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<td>somatosense - itch</td>
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<td>hair cells</td>
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<td>lateral line</td>
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<td>vestibular system</td>
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<td>hearing</td>
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<td>swiftlet &amp; oilbird echolocation</td>
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<td>marine mammal echolocation &amp; anthropogenic noise</td>
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<td>chemosense 1 (all but vertebrate olfaction)</td>
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<tr>
<td>olfaction - vertebrates</td>
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<td>invertebrate eyes (use Joseph’s new lecture)</td>
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<td>vertebrate eyes</td>
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<td>visual transduction</td>
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<td>electrosense</td>
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