

Syllabus BI 353 Sensory Physiology (Fall 2022)

Instructor: **Kip Keller**, Ph.D.

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OFFICE HOURS: (9-11 Fri, 138A Esslinger; or by appointment)

Discussion Instructor: **Molly Shallow**

Email: mshallow@uoregon.edu

OFFICE HOURS: (2:30-3:30 Thurs. LISB 2nd floor atrium or by zoom, or by appointment)

LECTURE: (HEDCO 146):12:00-13:20 Tu /Th

DISCUSSION: (112 Esslinger): 11:00-11:50 *or* 12:00-12:50 Friday

Course Materials: Research Papers and Other Readings assigned in Canvas
(NO TEXTBOOK)

Introduction to the class

In Sensory Physiology we will concentrate on the '**Special Senses**' – that is senses that have a specialized organ (like the eye or ears) with special afferent nerves to the Central Nervous System (CNS). We will also discuss a few of the '**General Senses**' such as 'touch', the 'electrosense' and the 'lateral line' that have many receptors across the body. For each sense, we will first characterize the stimulus modality (what is a sound wave? How does sound behave in the environment?) and begin our study with a tour of how the sense is used in a variety of animals and across evolutionary time. We will examine the variety of receptors, how they function and how they might be evolutionarily related. This will lead us to examine a few animals (usually including mammals) in more detail.

We will start the course with a very quick REVIEW of the nervous system (mostly of vertebrates), its development, general structure and physiology. These topics should be a 'review' and will be assumed knowledge as the basis of our work going forward. If you need more of a review, please consult with the suggested reading BEFORE the end of the first week.

Textbooks for brushing up basic knowledge:

Fred Delcomyn, Foundations of Neurobiology

Gary Matthews, Neurobiology: Molecules, Cells, Systems

Eric Kandel et al., Principles of Neural Science

John Nicholls et al. From Neuron to Brain

Submitting Assignments

Electronic submission via Canvas: PDF, MS word

If Canvas doesn't work, as a last resort, email to keller@uoregon.edu.

Lecture Schedule: *Subject to change, depending on lecture pace and student feedback

	Date	Topic and page links	Discussion Section Readings
Lecture #1	Tuesday, Sept 27	Intro; Development	
Lecture #2	Thursday, Sept 29	Development	
Discussion A	Friday, Sept 30		Blind Cavefish
Lecture #3	Tuesday, Oct 4	Cellular Neurophysiology	
Lecture #4	Thursday, Oct 6	Cellular Neurophysiology	
Discussion B	Friday, Oct 7		Resting Potential
Lecture #5	Tuesday, Oct 11	Chemosensation	
Lecture #6	Thursday, Oct 13	Chemosensation	
Discussion C	Friday, Oct 14		Fast Odor Encoding
	Tuesday, Oct 18	Exam 1	
Lecture #7	Thursday, Oct 20	Touch (Somatosensation)	
Discussion D	Friday, Oct 21		Whisking
Lecture #8	Tuesday, Oct 25	Mechanosensory Lateral Line	
Lecture #9	Thursday, Oct 27	Mechanosensory Lateral Line	
Discussion E	Friday, Oct 28		Corollary Discharge

Lecture #10	Tuesday, Nov 1	Electrosensory System	
Lecture #11	Thursday, Nov 3	Auditory System	
Discussion F	Friday, Nov 4		Spatial Acuity
Lecture #12	Tuesday, Nov 8	Auditory System	
	Thursday, Nov 10	Exam 2	
No class	Friday, Nov 11	Veterans Day	No Class
Lecture #13	Tuesday, Nov 15	Auditory System	
Lecture #14	Thursday, Nov 17	Visual System	
Discussion G	Friday, Nov 18		Mammalian ITD Coding
Lecture #15	Tuesday, Nov 22	Visual System	
No class	Thursday, Nov 24	Thanksgiving	
No class	Friday, Nov 25	Thanksgiving	No Class
Lecture #16	Tuesday, Nov 29	Visual System	
Lecture #17	Thursday, Dec 1	Visual System	
Discussion H	Friday, Dec 2		Expectation in V1
	Friday Dec 9 8 AM	Final Exam	

Grade components:

ITEM	#	points	date(s)
Midterm 1	1	25	Tues Oct 18
Midterm 2	1	25	Thurs Nov 10
Final	1	30	Fri Dec 9 (8 AM)

Reading Reports	8	16	Friday AM (before class)
Attendance/Participation		5	
Total		101	

Three Exams (two midterms, final: 80% total)

Exams will test conceptual understanding, not just information. The exams will be part multiple choice, part fill-in-the-blank/match the information and part free response. Each exam will concentrate on the material covered since the previous exam.

No make-up exams will be administered without a valid, **documented** reason for the absence. If unforeseen circumstances prevent you from taking an exam, notify the instructor immediately. Allowable excused absences are court orders, documented medical emergencies and athletic events such as away games for student athletes. All such occasions must be accompanied by official documentation. Make-up exams may be essay-type.

Eight Discussion Session Reading Reports (16%)

A summary report of the week's research paper will be due on each Friday morning by 11:00 AM. Students will be assigned to one or more figures from the paper. Reports will briefly summarize the paper's main finding(s) and method(s). The reports will then explain the assigned figure(s) and their relevance to the paper's main finding(s). In addition, each student (generally three students per Discussion Section meeting) will lead the discussion for their assigned figure(s) of the day. The week's presenters will have no written assignment for that week.

Each student will present once. You must [sign up to present](#) by **Thursday 2 PM, September 29th. Any student not signed up at that time will be assigned by the Instructors.**

Brief descriptions and an example of how to [read](#) and how to [present](#) a research paper are available.

Check your weekly assignment on the weekly 'Assignment' page. A [sample Reading Report](#) and a template is available [here \(.doc\)](#) and [here \(.pdf\)](#). Please use the template.

All submissions via Canvas. No late submissions allowed (deadline: Fridays at 11:00 AM).

No more than 400 words.

You will get feedback. Future submissions that do not show an attempt to respond to the feedback will result in a lowered grade.

Class attendance & participation (5%)

Attendance will be noted during each class. Students are expected to attend every class, and there is no make-up for missed classes (exceptions: academic or documented health issues). For all Discussion Sections, each student is expected to have read the paper for that day and to be familiar with the methods and results sections. Students will be assigned to lead a particular day's discussion, but all students are expected to actively participate.

Use of electronic devices during class time without the instructor's consent is prohibited.

Students with Disabilities

The University of Oregon is working to create inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your participation, please let me know as early as possible, in person or via email. You may also wish to contact [Accessible Education Services Links to an external site.](#) in 360 Oregon Hall, by phone at (541) 346- 1155 or uoaec@uoregon.edu. I welcome the chance to help you learn, and will work with you to help make it a good learning opportunity and experience.

Academic Disruption due to Campus Emergency

In the event of a campus emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face, students should log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or with other instructions on Canvas. In the event the instructor of this course has to quarantine, the course may be taught online during that time.

Academic Misconduct

The University Student Conduct Code (available at conduct.uoregon.edu [Links to an external site.](#)) defines academic misconduct. Students are prohibited from committing or attempting to commit academic misconduct. If there is any question about whether an act constitutes academic misconduct, it is the students' obligation to clarify the question with the instructor in advance.