Syllabus BI 353 Sensory Physiology (Fall 2023)

Instructor: Kip Keller, Ph.D.

Email: keller@uoregon.edu

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

Discussion Instructor: Maddie McAndrew

Email: mmcandr7@uoregon.edu

OFFICE HOURS: (location TBD; Mon 10-11, or by appointment)

LECTURE: (105 Esslinger): 12:00-13:20 Tu /Th

DISCUSSION: (5 Klamath): 12:00-12:50 *or* 13:00-13:50 Friday

Course Materials: Research Papers and Other Readings assigned in Canvas

(NO TEXTBOOK)

Links to Possibly Useful Course Info and Docs

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 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

Before-Class videos, "Understanding Checks" and assigned readings via Canvas

Lecture Schedule: (links below will become active as we get to each topic)

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

	Date	Weekly Topic-Page links	Assigned Videos & Readings
Lecture #1	Tuesday, Sept 26	Intro; Development	video 1
Lecture #2	Thursday, Sept 28	Development	video 2
Discussion A	Friday, Sept 29		**Blind Cavefish**
Lecture #3	Tuesday, Oct 3	Cellular Neurophysiology	video 3
Lecture #4	Thursday, Oct 5	Cellular Neurophysiology	video 4
Discussion B	Friday, Oct 6		**Resting Potential**
Lecture #5	Tuesday, Oct 10	Chemosensation	video 5
Lecture #6	Thursday, Oct 12	Chemosensation	video 6
Discussion C	Friday, Oct 13		**Odor Encoding**
	Tuesday, Oct 17	**Exam 1**	

Lecture #7	Thursday, Oct 19	Touch (Somatosensation)	video 7
Discussion D	Friday, Oct 20		**Whisking**
Lecture #8	Tuesday, Oct 24	Mechanosensory Lateral Line	video 8
Lecture #9	Thursday, Oct 26	Mechanosensory Lateral Line	video 9
Discussion E	Friday, Oct 27		**Corollary Discharge**
Lecture #10	Tuesday, Oct 31	Electrosensory System	video 10
Lecture #11	Thursday, Nov 2	Auditory System	video 11
Discussion F	Friday, Nov 3		**Spatial Acuity**
Lecture #12	Tuesday, Nov 7	Auditory System	video 12
	Thursday, Nov 9	**Exam 2**	
No class	Friday, Nov 10	Veterans Day	No Class
Lecture #13	Tuesday, Nov 14	Auditory System	video 13
Lecture #14	Thursday, Nov 16	Visual System	video 14
Discussion G	Friday, Nov 17		**Mammalian ITD Coding**
Lecture #15	Tuesday, Nov 21	Visual System	Video 15
No class	Thursday, Nov 23	Thanksgiving	
No class	Friday, Nov 24	Thanksgiving	No Class
Lecture #16	Tuesday, Nov 28	Visual System	video 16
Lecture #17	Thursday, Nov 30	Visual System	video 17
Discussion H	Friday, Dec 1		**Expectation in V1**
	Monday Dec 4 8 AM	**Final Exam**	

Grade components:

ITEM	#	points	date(s)
Midterm 1	1	25	Tues Oct 17
Midterm 2	1	25	Thurs Nov 9
Final	1	25	Mon Dec 4 (8 AM)
Discussion	8	18	Friday AM (before class)
In Class		12	various
Total		105	

In-class participation and "Understanding Checks" (12 pts)

Every lecture will have a short video posted on Canvas for viewing before class. Some lectures will begin with a brief (~5 min) “Understanding Check.” These will require written short answers or labeled drawings and will count towards the “**Attendance and participation”** part of your final grade.

Three Exams (two midterms, final) (75 pts)

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 word-limited free response or drawings. Each exam will concentrate on the material covered since the previous exam.

Discussion Session Readings and "Understanding Checks" (18 pts)

Each Discussion Session will focus on a research paper related to that week's lecture topics.

All students are expected to carefully read the week's assigned paper and complete a brief "Understanding Check" on Canvas **before coming to class** (7 x 1 = **7 pts**).

Once during the quarter and in lieu of the before-class "Understanding Check," students will present that week's assigned paper to the class (**3 pts**; see instructions below).

Following the in-class presentations, there will be a short in-class “Understanding Check” based on the research paper's Figures presented in class (8 x 1 = **8 pts**).

Each student will present once. You must sign up to present by **Thursday 2 PM, September 28th. Any student not signed up at that time will be assigned by the Instructors.**

There will likely be opportunities for extra-credit 2nd presentations as the quarter progresses.

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.

Make-up exam (maximum 25 pts)

Students are eligible for the make-up exam only with 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.

The final exam will allow a choice of questions. These 'extra' (un-chosen) questions will serve as the make-up exam.

The percentage obtained on this make-up exam will be applied to the number of points being "made up" (maximum 25 pts).

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 Mi*sconduct*

The University Student Conduct Code (available at conduct.uoregon.eduLinks 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.*