

Auditory Neuroscience
Neurbio 260
Fall Quarter, 2019

Time and place: Lectures: MWF 1-1:50 p.m. in Steinhaus Hall, SH134
 Journal discussion, occasional Tuesdays (see below), 4-5 p.m., Med Sci E conf. room

Course coordinator:

Prof. Raju Metherate

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Textbook: None; assigned readings will be provided. Optional texts for background material are listed here, but online references are good, too. No single text covers the course material fully and few instructors use a textbook. Optional references:

- Yost (2005) Fundamentals of Hearing, An Introduction (5th ed.)
- Moore (2012) An Introduction to the Psychology of Hearing (6th ed.)
- Schnupp, Nelken, King (2012) Auditory Neuroscience: Making Sense of Sound

Assigned Readings: TBA, pdf files will be on website.

Description: Center for Hearing Research (CHR) faculty cover the auditory system from cells to psychophysics, cochlea to cortex, basic science to clinical. Format is mostly lecture with some discussion of primary literature. We will provide a foundation for students who are advanced in their own discipline (e.g., biology, cognitive science) and wish to learn more about hearing research across multiple disciplines. Course will provide an overview of brain mechanisms of hearing, including processing of simple and complex sounds, including speech. We begin with sound itself, and look at processing by the ear, central auditory pathways including cortex and plasticity; also auditory development, learning and clinical issues.

Exams and grading

Four essay-type exams (including journal articles), 20% each

Journal article presentation/discussion/participation, 20%

Syllabus

Date	Topic	Instructor
Sept 27	Introduction / orientation	Metherate
30	Sound, cochlea	Metherate
Oct 2	Sensory transduction	Metherate
4	Noise-induced damage	Metherate
7	Auditory coding of speech sounds	Middlebrooks
9	Auditory nerve	Middlebrooks
11	Auditory brainstem anatomy	Middlebrooks
14	and physiology	Middlebrooks
16	Mid-term exam 1	
18	Spatial Hearing I	Middlebrooks
21	Spatial Hearing II	Middlebrooks
23	Auditory cellular specializations	Metherate
25	Development I	Cramer
28	Development II	Cramer
Tues 29	Journal discussion	Cramer
30	Development III	Cramer

Nov 1	Mid-term exam 2	
4	Auditory forebrain	Metherate
6	A1	Metherate
8	Auditory cortex processing ...	Metherate
11	Holiday (Veteran's Day)	
Tues 12	Journal discussion	Metherate
13	... and plasticity	Metherate
15	Psychoacoustics I	Richards
18	Psychoacoustics II	Richards
Tues 19	Journal discussion	Richards
20	Psychoacoustics III	Richards
22	Mid-term exam 3	
25	Psychoacoustics IV	Richards
27	Found. of auditory prostheses	Middlebrooks
29	Holiday (Thanksgiving)	
Dec 2	TBA	Stickney
4	Clinical: Cochlear implants	Lin
6	Clinical: Future directions	Djalilian
Tues 10	Journal discussion	Middlebrooks
11*	Mid-term exam 4 (*1:30 pm)	