

Auditory Neuroscience
Neurbio 260
Fall Quarter, 2017

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

Course coordinator:

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 textbooks:

Yost (2005) Fundamentals of Hearing, An Introduction (5th ed.)

Moore (2012) An Introduction to the Psychology of Hearing (6th ed.)

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.

Grading

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

Journal article presentation/discussion/participation, 20%

Syllabus

Date	Topic	Instructor
Sept 29	Introduction / orientation	Metherate
Oct 2	Sound, cochlea	Metherate
4	Sensory transduction	Metherate
6	Noise-induced damage	Metherate
9	Auditory nerve	Middlebrooks
Tues 10	Journal discussion	Metherate
11	Auditory brainstem anatomy	Middlebrooks
13	and physiology	Middlebrooks
16	Mid-term exam 1	
18	Auditory cellular specializations	Metherate
20	Spatial Hearing I	Middlebrooks
23	Spatial Hearing II	Middlebrooks
25	Development I	Cramer
27	Development II	Cramer
30	Auditory forebrain	Metherate
Tues 31	Journal discussion	Cramer
Nov 1	Mid-term exam 2	
3	A1	Metherate
6	Auditory cortex processing ...	Metherate
8	... and plasticity	Metherate

10	Holiday (Veteran's Day)	
13	Psychoacoustics I	Richards
Tues 14	Journal discussion	Richards
15	Psychoacoustics II	Richards
17	Psychoacoustics III	Richards
20	Mid-term exam 3	
22	Auditory coding of speech sounds	Middlebrooks
24	Holiday (Thanksgiving)	
27	Objective measures of hearing	Starr
29	Neurobiol of speech processing	Gage
Dec 1	Child language development	Gage
4	Found. of auditory prostheses	Middlebrooks?
6	Clinical: Cochlear implants	Lin
8	Clinical: Future directions	Djalilian
Tues 12	Journal discussion	Middlebrooks
13	Mid-term exam 4 (1:30-3:30pm)	