

PSY 348 Music and the Brain
Summer 2016

Lectures

M, T, W, Th 12:00-1:50 pm in Lillis Hall 212

Instructors

Jonathan Saunders jsaunder@uoregon.edu
Thursdays 2:00-3:30 pm or by appointment in LISB 206
Iryna Yavorska yavorska@uoregon.edu
Tuesdays 2:00- 3:30 pm or by appointment in LISB 206



Textbook

None. PDF documents for reading are posted on canvas <https://canvas.uoregon.edu>.
You should check Canvas frequently for announcements, etc.

Overview

What are the neural correlates of our perception of tonality, harmony, melody, and rhythm? How do these relate to acoustics, auditory neurobiology, perceptual grouping mechanisms, brain damage, and cognitive neuroscience?

Objectives

To develop the tools and knowledge to ask meaningful questions about music and the brain, how to frame these questions, and how one might attempt to answer them.

Description

This course uses music as a unifying theme to introduce fundamental concepts and open questions in a broad range of approaches to brain science. Throughout the course, we explore music at several levels of analysis, ranging from individual notes to melody, harmony, and rhythm. In parallel, we ask how these different levels are processed by neurons, the brain, and the mind. We cover physical and mathematical descriptions of sound, including an introduction to acoustics, spectral analysis, and the frequency domain. We go over the neurobiology of the auditory system, including fundamental concepts and methodology in sensory and systems neuroscience. We will cover several key areas of cognitive psychology, including perceptual grouping, working memory, and mental imagery. Finally we cover several approaches to cognitive neuroscience, such as human brain imaging and the specific effects of brain damage. In all of these areas, we use music and our perceptual experience of music as a unifying framework. There are no prerequisites. This course satisfies the University Science Group Requirement. This course assumes no previous knowledge of music theory or neuroscience but will introduce basic concepts and methods relevant to these fields.

Optional readings

"This is your brain on music," by Daniel Levitin

"Musicophilia," by Oliver Sacks

Both are popular best-sellers and are available on Amazon, etc.

Format

Material is presented through a combination of lectures, in-class demonstrations, and assigned readings (estimated 2-4 hours per week). There are no discussion sections or laboratories.

Plagiarism

Plagiarism is taken very seriously and is grounds for failure or expulsion. You are responsible for understanding what constitutes plagiarism and how to avoid it in your work. If you are in uncertain whether something specific in one of your assignments constitutes plagiarism, please contact us before turning it in. Excellent guides on plagiarism can be found at <http://libweb.uoregon.edu/guides/plagiarism/students/> and <http://www.plagiarism.org>. The UO student conduct code that defined plagiarism can be found here: <https://policies.uoregon.edu/vol-3-administration-student-affairs/ch-1-conduct/student-conduct-code>. Term papers will analyzed with plagiarism detection software.

Grading

Problem sets (4)	25%
End of the week tests (4)	25%
Final project (1)	50%
• topic (10%)	
• outline (20%)	
• final paper (80%)	

100%

Problem sets

Problem sets will be handed out at the beginning of each week. They are due as an upload to Canvas on Friday that week at **NOON (12 pm)**. Please submit files as a Word document or PDF, if you would like to work on them by hand there are document scanners available in the Knight and Science Libraries. Don't wait till Friday to complete your work. Problem sets are designed to be involved and will require your critical thinking and problem solving skills. They are meant to be challenging and outside your comfort zone – as such they will be scored not only based on the accuracy of your answers, but by demonstrating that you made an honest attempt to answer them to the best of your abilities. You are welcome to ask instructors for help or use other resources that are available to you. However, your answers must be your work and effort.

End of the week tests

You are required to do the readings before each class and keep up during the course. To avoid having a final cumulative exam, you will be tested at the end of each week on Friday at **NOON (12 pm)**. The tests will assess your progress and understanding of course materials. They are closed notes and should take ~30 min to complete.

Final project

The paper, or project write-up if you choose to complete a project, should be 8-10 pages, double spaced, and is due at the beginning of the last class (see Calendar on canvas for exact date). Submit your paper through Canvas. Do NOT email your paper to the instructors. Emailed papers will not be accepted. The topic can be anything related to the course. A set of guidelines for project topics, format, expectations, etc. are posted on Canvas or also at <http://www.uoneuro.uoregon.edu/wehr/PaperProjectTopics.pdf>. You are strongly encouraged to read these guidelines carefully. Regardless of which topic you choose, you must submit the topic for approval by the night before Day 8 via canvas.

Required Format for the paper:

- The filename should include your last name, for example: smith-psy348.doc.
- Include page numbers.
- Include a header with your name and a shortened title (~25 words or less).
- use .doc or .pdf

Laptops policy

Laptops are permitted during lecture only for taking notes. Please do not multitask. Please do not use Facebook, check your email, etc., which is visually distracting to other students behind and around you, and disrespectful to the rest of the class. Your grade is not based on your attendance – though it is strongly encouraged – so please do not come to class if you don't intend to pay attention.

Schedule

Date	Topic	Reading	Due
08-15	Introduction to class; Musical space	Ch.0+1	
08-16	Sound Waves	Ch.2+6	
08-17	The Ear & Sound perception	Ch.3+4	
08-18	Tonality	Ch.5	Problem Set 1 Quiz 1
08-22	Auditory System (Subcortical)	[?]	
08-23	Auditory System (Cortical) & Neural Models	[?]	
08-24	Rhythm	Ch.7	Paper topic
08-25	Speech perception	[?]	Problem Set 2 Quiz 2
08-29	Music & Development	[?]	
08-30	Grouping	Ch.9	
08-31	Top-Down Auditory Processing	[?]	Paper outline
09-01	Psychoacoustics	[?]	Problem Set 3 Quiz 3
09-05	Brain damage and brain activity	Ch.10	
09-06	Music & emotion; Music Therapy	Ch.13+16	
09-07	Ear worms; Musical hallucinations;	Ch.11+15	
09-08	Wrapping up; Final questions		Paper due