PSY 348: Music and the Brain
Winter 2010
CRN: 26169
last updated: January 3, 2010

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.

Lectures

Tuesday & Thursday 4:00–5:20 PM; 110 Fenton Hall
Lecture notes are available on Blackboard before the lecture, you are encouraged to print them out and bring them to class for taking notes.

Instructor

Mike Wehr
wehr@uoregon.edu
office hours: Monday 2:00-3:00 PM in 206 Huestis
or by appointment.

Teaching Assistants	Caitlin Monaghan cmonagha@uoregon.edu Office hours: Monday 11-12 233 Huestis 346-4036	Amy Tretakis tretakis@uoregon.edu Thursday 1:30-3:30 Straub 323 346-4902
Textbook	none	
Readings	All course readings will be available on Blackboard: https://blackboard.uoregon.edu You should also check Blackboard frequently for announcements, course materials, etc.	
Required Texts	LOL, omg, wtf, btw, :-D	
Optional Reading	"This is your brain on music," by Daniel Levitin "Musicophilia," by Oliver Sacks Both are popular best-sellers and are available at the bookstore.	
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.	
Discussion Board	Can be used to interact with instructor and other students, and is available on Blackboard. You may post anonymously.	
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. Excellent guides on plagiarism can be found at http://libweb.uoregon.edu/guides/plagiarism/students/ and http://www.plagiarism.org. To help educate students about what constitutes plagiarism, in this course we will be using a plagiarism education blackboard plugin to submit term papers.	
Cell Phones	If it rings in class, or if you're talking or texting on it, it's mine.	

Grading

Midterm Exam	25%
Final Exam	25%
Paper	25%
Problem Sets	25%
	100%

Exams

The midterm will be in-class, on February 4. It will be open book, open notes. The final will be a take-home exam, open book, open notes, will cover the material from the entire course, and will be available on Blackboard after the last class on Thursday, March 11, and due by noon on Monday, March 15.

Paper/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 class on Thursday, March 4 (submit through Blackboard). The topic can be anything related to the course. A number of example topics are available on Blackboard, but regardless of which topic you choose, you must submit the topic for approval by Wednesday, February 17 (submit as part of that day's Problem Set).

Format for the paper:

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

Problem Sets

You must do the assigned reading *before* each lecture. The day before each lecture, after you've completed the reading, you will need to log onto Blackboard and complete the online Problem Set. These are required; they are due by 11:59 p.m. the night before each lecture, and count for 25% of your final grade in the course. The objective of the problem sets is to help make sure you understood the important points from the reading, to review concepts and material from lectures, and to help prepare you for the exams. You will also occasionally have a chance to share any aspects of the course that you did *not* understand, were confused by, or had any other kind of trouble with. Your responses about what you *didn't* understand (and you are surely not alone) will help guide upcoming lectures.

Schedule (please be sure to download the Calendar in the Course Documents section of Blackboard for the most up-to-date schedule)

1. Tuesday, January 5
Music and the Brain
No reading

2. Thursday, January 7
Musical Space
Reading: Hall, “Musical Acoustics”, Ch 1-2

3. Tuesday, January 12
Perception of Tones
Reading: Rasch & Plomp, “The Perception of Musical Tones,” parts I-II

4. Thursday, January 14
Consonance and Dissonance 1
Reading: Rasch & Plomp, “The Perception of Musical Tones,” parts III-end

5. Tuesday, January 19
Consonance and Dissonance 2
Reading: Thompson, “Music of the Hemispheres”

6. Thursday, January 21
Tonality
Reading: Machlis & Forney, “The Organization of Musical Sounds”

7. Tuesday, January 26
Neurobiology of the auditory system 1
Reading: Weinberger, “Music and the Auditory System”

8. Thursday, January 28
Neurobiology of the auditory system 2
No reading

9. Tuesday, February 2
Neurobiology of the auditory system 3
No reading

10. Thursday, February 4
Midterm exam in class
No reading

11. Tuesday, February 9
Rhythm
Reading: just the lecture notes

12. Thursday, February 11
The Missing fundamental in infants
Reading: He & Trainor, 2009 “Finding the pitch of the missing fundamental in infants”

13. Tuesday, February 16
Grouping mechanisms in music 1
Reading: Deutsch, “Grouping Mechanisms in Music”

14. Thursday, February 18
Grouping mechanisms in music 2
No Reading
Paper topics due in quiz February 17th

15. Tuesday, February 23
Neural specializations for tonal processing
Reading: Zatorre, “Neural specializations for tonal processing”

16. Thursday, February 25
The topography of tonality
Reading: Janata, “The cortical topography of tonal structures underlying Western music”

17. Tuesday, March 2
No Class
No Reading

18. Thursday, March 4
Musical Imagery
Reading: Halpern, “Cerebral substrates of Musical Imagery”
Papers due at noon (in Assignments on Blackboard)

19. Tuesday, March 9
Songbirds
Reading: Brenowitz, “An Introduction to Birdsong and the Avian Song System”

20. Thursday, March 11
Musical Hallucinations
Reading: Zimmer, “Neuron network goes awry, and brain becomes an iPod”
Last class
Final exam becomes available

Monday, March 15
Final due by 5 p.m.