PSY 348: Music and the Brain, Winter 2015, Dr. Christina Karns ["Dr. Karns"]
Mondays and Wednesdays: 4:00 pm – 5:20 pm (16:00-17:20). 123 PAC Pacific Hall 123

Course Questions 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?

Course Overview

I love to teach, and my goal is to teach you about music, your brain, and a how your musical perceptions are constructed from physical inputs in as comprehensive and engaging a manner as I can. There are no prerequisites, but this is a challenging course. 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. Hopefully you will work hard and have fun along with me.

At the end of this course you will:

- have the foundational knowledge to explore music at several levels of analysis:
    - physical properties of sound
    - mathematical descriptions of sound (spectral analysis/frequency domain)
    - individual notes
    - melody
    - harmony
    - rhythm
- have the foundational knowledge to understand how the brain processes sound and music
    - auditory sensory and systems neuroscience
    - cognitive psychology of music (e.g. perceptual grouping, working memory, mental imagery)
    - brain imaging
    - effects of specific brain damage
- be able to ask meaningful questions about how the brain processes music
- be able to identify how one might attempt to answer these questions empirically

In all of these areas, we use music and our perceptual experience of music as a unifying framework.

Dr. CHRISTINA KARNS, PH.D. ("Dr. Karns") ckarns@uoregon.edu (Subject: Psych 348) 541-321-MIND **see below LISB 179 Office Hours: or by appointment Location: LISB 179 Lewis Integrative Sciences Building (LISB). **Directions below. Enter through the main entrance. Ring the doorbell for the Neville Lab and ask for me. Feel free to ask for an appointment if you can't attend office hours.	Grace Binion Lead GTF ghicks7@uoregon.edu Office Hours: T/R 8-9:30am or by appointment Location: Straub 365	JENNY MENDOZA Assistant GTF (Blackboard/Canvas) jmendoz4@uoregon.edu Office Hours: By appointment

*** Dr. Karns' office: LISB 179. Enter through the main entrance of LISB. Ring the doorbell for the Neville Lab and ask for me. Feel free to ask for an appointment if you can't attend office hours.*

Phone/Text: 541-321-MIND or 541-321-6463 – This is my teaching number for course-related texts and phone calls. A quick text is appropriate to cancel an appointment, get directions to my office (e.g. if you get lost), or find me if I stepped out of office hours (include your name). You can also use this number for calls during office hours or by appointment if you are unable to come by in person.

Getting your questions answered:

For all your course-related questions and content-related questions, post your question to the Blackboard/Canvas Discussion Forum. Then everyone can benefit from the discussion — and you will get a quicker answer from me, your teaching assistants, or your classmates. Forum participation can even boost your participation grade. Course-related questions of a sensitive nature can be addressed to ckarns@uoregon.edu. Include Psych 348 in the subject heading.

About your instructors

Christina Karns, Ph.D.

I'm a brain nerd! My Ph.D. is in Neuroscience from University of California, Berkeley. I've been doing brain research – mainly human neuroimaging — since before there was google. My favorite brain research topics are attention, "multisensory integration" or how your senses combine, neuroplasticity, and the neuroscience of positive emotions. I balance teaching with a busy research career that involves designing and conducting experiments, supervising student researchers, analyzing data, writing scientific manuscripts and writing grants. Besides brain research and teaching, I also love great music, inspiring art, and my family and friends. Come by and talk to me in my office hours or make an appointment if you want to chat about course content or your interests in psychology or neuroscience.

Grace Binnion

Grace is our lead teaching assistant (GTF). Grace is a first-year doctoral student in the clinical psychology. In her research, she asks: What are the psychological, neural, and physiological processes that explain why some children and adolescents are resilient following experiences such as childhood trauma and parental psychopathology? Grace will also check my teaching email and course phone number. She will assist students with their questions and will assist me with writing and grading exams and quizzes, will assist with grading term projects and will hold office hours.

Jenny Mendoza

Jenny will help with Blackboard and/or Canvas issues as assistant GTF. Please CC her on any emails relating to technical issues with the course at jmendoz4@uoregon.edu.

Course Policies

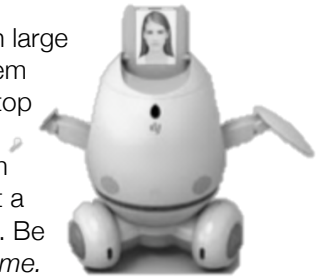
Enrollment: 150. Waitlisted students will be admitted through Duckweb as other students drop the class. See http://registrar.uoregon.edu/help/waitlisting for more information.

Short version:

- Respect other students
- Respect your instructors
- Don't cheat
- Plan ahead.

Long version:

- Large Lecture Etiquette: It is helpful if you leave aisle seats open for those arriving after you. If you are late, enter quietly and respectfully. Don't interrupt the learning of other students to catch yourself up, wait until after class. Don't pack up early. If you know you need to leave early, sit toward the back aisle and pack up after you leave the classroom. Please sit in the front section of PAC 123 so I can see you and you can hear me.
- Discussion: There may be some discussions in this class where people express strong opinions that you strongly disagree with. I encourage you to express your disagreement in a respectful and professional way. Disrespect of others will not be tolerated and you will be asked to leave.
- Laptop policy: Instructors and students vary in how disruptive they find electronic devices in large lectures. In the past have not allowed them. I'm experimenting this term with allowing them on a trial basis. To avoid distracting other students behind and around you, use your laptop for notes only. Do not multitask because it visually distracts surrounding students. I haven't seen any research on how audience-electronics affect the quality of lectures from the instructor, but I know that I like to feel like people are listening, and I think you will get a better lecture if you look attentive. See this teaching robot to the right? Ya, that's not me. Be nice to me ☺. *If you are distracted by the behavior of others in the course, come talk to me.*



- Cheating: My definition of cheating is the act of deceiving the instructors or other students to give rewards to someone — you or someone else — who has not earned those rewards.
  A few examples of cheating: Using a friends i-clicker to give them class-participation points when they are not present, copying answers on an exam or quiz from someone else, procuring a copy of the exam before you take it, changing your answers after an exam is graded and asking for it to be re-graded, presenting the written content of someone else as if it were your own instead of citing a published source (plagiarism). I will be creative and proactive about catching people cheating. If you cheat, I will enforce all university rules and you will fail my course. Did you know that people who cheat over-estimate the prevalence of other cheaters? They think most people cheat — which isn't true. They are often in denial of the seriousness of cheating – cheating is actually a big deal. Why would I care so much about cheating? It's more work for me to care! Well, my job is to make sure students learn this material. Everyone learns better when they know that they are accountable along with everyone else.
- Additional Support: There are many counseling resources available to you and I encourage you to seek out any support you need. Did you know about TLC at the UO? -- great instructional resources for students.
- Posting lecture notes: The PowerPoint for the lectures will be posted online (Blackboard/Canvas). Hopefully that will

occur before lecture, but may be delayed if I make last minute changes. I encourage you to print them and make notes. If you do the readings on time, attend lectures, take notes, ask questions when you are confused, and study effectively, I anticipate you will do very well in this course. Lecture slides may be posted at my discretion to aid in your learning of certain topics.

- Attendance & Extensions: If a student has an unforeseen exceptional personal or health-related issue that prevents them from being able complete an assignment or exam on-time, extensions can be offered when accompanied by reasonable documentation. Students with conflicting final exam schedules (see university policy) must alert me as soon as possible and definitely by the last day to add classes. Arrangements will be made for an alternative exam. You must notify me of planned university-related absences (such as those by student athletes) as soon as possible.
- Affirmation of Community Standards: "The University of Oregon community is dedicated to the advancement of knowledge and the development of integrity. In order to thrive and excel, this community must preserve the freedom of thought and expression of all its members. The University of Oregon has a long and illustrious history in the area of academic freedom and freedom of speech. A culture of respect that honors the rights, safety, dignity and worth of every individual is essential to preserve such freedom. We affirm our respect for the rights and well-being of all members."
- Accessible Education: The University of Oregon is working to create inclusive learning environments. If there are aspects of the in this course that result in barriers to your learning and participation, please let me know. You are also welcome to contact the Accessible Education Center (http://aec.uoregon.edu, formerly Disability Services) in 164 Oregon Hall at 346-1155 or uoaec@uoregon.edu
- The University Student Conduct Code defines academic misconduct. "Students are prohibited from committing or attempting to commit any act that constitutes academic misconduct. By way of example, students should not give or receive (or attempt to give or receive) unauthorized help on assignments or examinations without express permission from the instructor. Students should properly acknowledge and document all sources of information (e.g. quotations, paraphrases, ideas) and use only the sources and resources authorized by the instructor. If there is any question about whether an act constitutes academic misconduct, it is the students' obligation to clarify the question with the instructor before committing or attempting to commit the act. Additional information about a common form of academic misconduct, plagiarism, is available by here.
  http://libweb.uoregon.edu/guides/plagiarism/students/

Required Texts & Materials

- *Blackboard/Canvas policy:* You are responsible for announcements posted to Blackboard. You should check Blackboard frequently for announcements, etc. Migration to Canvas may occur during the term.
- *iClicker2* – The iClicker is a good tool to assess your own knowledge as we go, to make a large course more interactive, and to reduce grading burdens for a large class. This also means your grade can be distributed across more small assignments. This is good for you. Note that the iClicker2 can be sold back to the bookstore. Older models are fine for this course but they cannot be sold back to the bookstore.
- *Required Readings:* An e-textbook by Dr. Michael Wehr, and supplementary readings from the scientific literature and popular press will be freely available through Blackboard and/or Canvas.
- *Suggested Readings: popular best-sellers available at the bookstore in the textbook section for PSY 348.*
  - "This is Your Brain on Music," by Daniel Levitin
  - "Musicophilia," by Oliver Sacks

Workload

Some of you have a fair amount of background in the brain, biology, or cognitive psychology. For others, there is quite a bit of reading and studying you may need to do to get a firm grasp on these background areas. Everything you need to pass will be covered in the course, but make sure you work hard learning and understanding this material so you can keep up! Note that this is an upper division science course. This course will be difficult. The material is advanced and the pace will be fast. The exams will be very challenging. See the course website for what students have said about the level of difficulty of this course. Nevertheless, I expect that any student who does the readings, shows up to class, and asks questions should be able to master the material and succeed in the course.

Credits = 4 Generally speaking, each credit is an hour spent in class plus 3 hours outside of class. For example, a 4-credit course would be 4 hours in class and 12 hours homework per week. In actuality, you have <3 hours in-class time for this course per week, and should budget at least 9 hours per week for studying for this course. That said, putting in the time does not guarantee that you will learn the material. You need to be sure your studying methods are effective, that you self-assess your own knowledge, and that address any weaknesses by seeking out assistance from my or your GTFs in a timely manner.

Grading

Point distribution	Letter Grades
▪ 20% — Homework assignments/Problem sets ▪ 10% — Clicker Questions, Attendance, Participation ▪ 20% -- Project ▪ 25% — Midterm Exam ▪ 25% —Final Exam	▪ A+ >= 99.0% ▪ A = 90-98.99% (typically the top 20-25%) ▪ B = 80-89.99% ▪ C = 70-79.99% ▪ D = 60-69.99% ▪ F = 0-59.99%

Except for the [A+], the plus [+] or minus [-] is awarded for the upper and lower third of points within each category.

W – Drop after April 6th	I -- http://registrar.uoregon.edu/incomplete_policy

Homework/Problem Sets (20%): *Due by 12:00 p.m. the day of each lecture*
We expect you to do the assigned reading *before* each lecture. After you've completed the reading, log onto Blackboard/Canvas and complete the required online Problem Set. Late problem sets will not be accepted, and there are no make-ups. I will drop your two lowest-scoring Problem Sets, so don't worry if you miss one or if you added the course late.

Clicker Questions, Attendance, Participation (10%):
We will use iClickers for answering in-class questions to review topics and encourage attendance and participation. iClickers are available for purchase at the UO Bookstore or elsewhere online. If cost is an issue, note that the iClicker2 can be sold back to the bookstore for about half the cost. The iClicker1 is also fine but cannot be sold back. You can also borrow a friend's, as long as they aren't enrolled in this course. You must register your Clicker to your Blackboard/Canvas account: log on to Blackboard, go to Course Documents, select iClicker Registration, and fill out the form with your name, Duck ID (this is your username, NOT your student ID number), and the clicker ID number located on the back of the clicker. I recommend that you put a piece of clear tape over the ID number so that it doesn't rub off. Please remember to bring your iClicker to class. Clicker questions will count for 10% of your total grade. Each day, about half of the clicker points are awarded regardless of whether you get the answers correct, as long as you attempt to answer at least 75% of the questions. The remaining half of the clicker points are awarded for correct answers. I will drop your two lowest-scoring days of Clicker points, so don't worry if you forget your clicker once or twice.

Objectives of Problem Sets and Clicker Questions:

1. Lots of relatively easy points (if you've done the reading) distributed daily throughout the term. This takes some pressure off the exams, in case you have a bad exam day.
2. Motivation to do the reading, show up to class, and pay attention.
3. Review concepts and material to help prepare for the exams.
4. Feedback to me about how much you're understanding, and what concepts need more emphasis in class.

Term Paper/Project (20%)
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 Day 12 (see Schedule Table for exact date). Submit your paper through the Assignment on Blackboard/Canvas. Do NOT email your paper to the instructor or TAs. Emailed papers will not be accepted. A set of guidelines for project topics, format, expectations, etc. are posted on Blackboard/Canvas. Read these guidelines carefully. Regardless of which topic you choose, you must submit the topic for approval by Day 8. 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

Midterm (25%)
The midterm exam will be in-class, on Day 10 (see Schedule Table for exact date). It will be open book, open notes. You may use your laptop. A word of advice about the midterm exam: even though it is open book, you should definitely study to prepare for the exam. The exam will test your understanding of concepts, rather than memorization. You will not have time during the exam to read and understand all the material for the first time. The more familiar you are with the material, the easier and faster it will be to refer to it during the exam.

Final (25%)
The final will be a cumulative take-home exam, open book, open notes, will cover the material from the entire course, and will be available on Blackboard/Canvas after the last class (Day 20; see Schedule Table for exact date), and due by 5 p.m. on the following Monday (see Schedule Table for exact date).

Schedule: The lecture content is subject to change and this list will get out of date because I adapt the course along the way to try to best meet the learning needs of my students. The course Blackboard/Canvas site is the best place to stay on track. All required readings will be posted to Blackboard/Canvas. Check Blackboard/Canvas frequently to make sure you don't miss any additional readings.

Day			Wehr Chapters	Sacks	Levitin	Additional	HW Due
Day 1	30-Mar	Music and the Brain Introduction. -- No reading					none
Day 2	1-Apr	Musical Space -- Reading Ch. 1	Ch. 1		Ch. 1		12:00 PM
Day 3	6-Apr	Perception of Tones -- Reading Ch. 2, Levitin Ch. 1, What is Music?	Ch. 2				12:00 PM
Day 4	8-Apr	Consonance and Dissonance 1 -- Reading Ch. 3	Ch. 3				12:00 PM
Day 5	13-Apr	Consonance and Dissonance 2 -- Reading Thompson, "Music of the Hemispheres"				Thompson	12:00 PM
Day 6	15-Apr	Tonality -- Reading Ch. 4, and Machlis & Forney, "The Organization of Musical Sounds"	Ch. 4			Machlis & Forney	12:00 PM
Day 7	20-Apr	The Ear -- Reading Ch. 5, Sacks Ch. 10, Pitch Imperfect: Cochlear Amusia *[Paper Topic Due]*	Ch. 5	Ch. 10			12:00 PM
Day 8	22-Apr	Neurobiology of the auditory system 1 -- Reading Ch. 6	Ch. 6				12:00 PM
Day 9 Midterm	27-Apr	Midterm exam in class					midterm
Day 10	29-Apr	Neurobiology of the auditory system 2 No reading					none
Day 11	4-May	Rhythm -- Reading Ch. 7 Papers due (in Assignments on Blackboard), Levitin Ch. 2, Foot Tapping	Ch. 7	Ch. 19 (opt)	Ch. 2		12:00 PM
Day 12	6-May	The Missing fundamental in infants -- Reading Ch. 8, and He & Trainor, 2009 "Finding the pitch of the missing fundamental in infants" [optional: Levitin Ch. 3, Behind the curtain]	Ch. 8		Ch. 3 (opt)		12:00 PM
Day 13	11-May	Grouping mechanisms in music 1 -- -- Reading Ch. 9, Deutsch, "Grouping Mechanisms in Music"	Ch. 9			Ch. 9 Deutsch	12:00 PM
Day 14	13-May	Development of music perception – Guest Lecturer – Jenny Mendoza				Hannon	12:00 PM
Day 15	18-May	Brain damage and brain activity in music -- Reading Ch. 10	Ch. 10	Ch. 16			12:00 PM
Day 16	20-May	The topography of tonality -- Reading Ch. 11, and Janata, "The cortical topography of tonal structures underlying Western music" *[Term Paper Due]*	Ch. 11			Janata	12:00 PM
Day 17	25-May	No Class – Memorial Day					none
Day 18	27-May	Musical Imagery -- Reading Halpern, "Cerebral substrates of Musical Imagery"		Ch. 4		Halpern	12:00 PM
Day 19	1-Jun	Songbirds -- Reading Brenowitz, "An Introduction to Birdsong and the Avian Song System"				Brenowitz	12:00 PM
Day 20	3-Jun	Musical Hallucinations -- Reading Zimmer, "Neuron network goes awry, and brain becomes an iPod"		Ch. 6		Zimmer	12:00 PM
Final Exam Open	4-Jun	Final exam becomes available.					
Final Exam Due	8-Jun	Final exam due by 5 pm on the Monday following Day 20 (Due Monday June 8th, 5 pm)					5:00 PM