



THE UCLA HERB ALPERT SCHOOL OF MUSIC



# MUSIC MIND & BRAIN

## MUSIC INDUSTRY 103

### SYLLABUS

SPRING TERM, 2014-2015 ACADEMIC YEAR

**Professor: Mark Jude Tramo, MD PhD**

**Location: Schoenberg Music Building, Room 1420**

**Time: April 1 - June 3, 2015 Wednesdays 6:30 – 9:30 PM**

**Course Website:**

<http://www.registrar.ucla.edu/schedule/detselect.aspx?termsel=15S&subareasel=MUS+IND&idxcrs=0103++++>

#### UPPER DIVISION COURSES

##### **MUS IND 103. Music Mind & Brain (4)**

Seminar, three hours/wk; outside study, nine hours/wk.

This seminar takes an interdisciplinary approach to understanding brain mechanisms mediating music perception, performance, and cognition. Students' natural interest in music serves as springboard for learning basic concepts about how brain works. The seminar focuses on specific themes such as harmony perception, rhythm production, health & medicine, and creativity. The course is designed to help students understand methodologies currently used to investigate mind-brain correlates. Fundamental principles in neurophysiology, psychophysiology, and neuroanatomy that are relevant to basic research in cognitive neuroscience and auditory neuroscience are emphasized. After three introductory lectures by Professor Tramo, student study-groups present key papers from the literature as a team. There will be guest professors from neuroscience, psychology, and the music industry. Every week, there are written homework assignments that are based on the lectures. The final examination is take-home based on the homework and lectures. There is letter grading based on attendance/punctuality (20%), homework score (30%), final exam score (30%), presentation/participation (20%).

#### **Faculty**

Mark Jude Tramo, MD, PhD

Director, The Institute for Music & Brain Science

Dept of Neurology, David Geffen School of Medicine at UCLA

Dept of Ethnomusicology, UCLA Herb Alpert School of Music

Email: [REDACTED]

URL: [www.BrainMusic.org](http://www.BrainMusic.org)

## Guest Faculty

John Iversen, Ph.D.\*  
Institute for Neural Computation  
UCSD

Rebecca Schaefer Ph.D. †  
Sage Center for Study of Mind  
UCSB

Tom Sturges\*\*  
Whilom Executive VP/ Head of Creative  
Universal Music Publishing, Santa Monica, CA  
Board of Trustees, Grammy Foundation, National Academy of Recording Arts & Sciences

Prerequisites: None

Requirements:

### ATTENDANCE

- Taken at the start of each class

### READING

- Class notes
- Handouts
- Course website announcements, PDFs, etc
- Articles assigned from journals for presentations and reading:
  - go to The Institute for Music & Brain Science website, <http://www.BrainMusic.org>
  - on the Home Page, click on "Education"; there, click on "Institute's eLibrary"
  - find the PDF using the author's name(s) or title of the paper
  - download the PDF of the paper and read it.

### OR

- go to the UCLA electronic library, search e-journals using the name of the journal the paper was published in
- find the year, volume, and page number of the paper you want
- download a PDF of the paper and read it.

### HOMEWORK

- Weekly assignments with questions from material covered in lectures and seminars
- Must be completed and emailed to Professor Tramo *before* the start of class the following week

### CLASS PARTICIPATION

- Attendance
- Active Participation, including answers and questions re: assigned reading
- One Seminar Powerpoint presentation of a professional journal publication as member of a weekly Seminar Study Section

### FINAL EXAMINATION

- Take-home
- Will be posted on the course website or emailed to each student by Mon **June 8<sup>th</sup>, 9AM**
- Must be completed *independently* by each student and emailed back to Professor Tramo no later than Wed **June 10, 2014 11:59 PM.**

**Recommended books:**

- *Harvard Dictionary of Music, 4<sup>th</sup> Edition*, Randel DM (Ed), 2003
- *The Unanswered Question: Six Talks at Harvard (The Charles Eliot Norton lectures)*. Leonard, B. 1981
- *Human Neuroanatomy, 9<sup>th</sup> Ed.* Carpenter M, 1996
- *Science of Sound, 3<sup>rd</sup> ed.* Rossing, T et al. 2001
- *Fundamentals of Hearing, 5<sup>th</sup> Ed.* Yost W. 2009
- *Oxford Handbook of Music Psychology*. Hallam et al. (ed) 2009
- *Emotion and Meaning in Music*. Meyer, L. 1956
- *Auditory Neuroscience: Making Sense of Sound*. Schnupp et al (Eds) 2012
- *The Auditory Cortex*. Winer J & Schreiner C (Eds) 2011
- *Every Idea Is A Good Idea: Be Creative Anytime, Anywhere*. Sturges, T. 2014
- *The Crisis of Classical Music in America: Lessons from a Life in the Education of Musicians*. Freeman, R. 2014
- *The Great Animal Orchestra: Finding the Origins of Music in the World's Wild Places*. Krause, B. 2013

## Lecture & Seminar Schedule

Each 3-hour class will be broken up into 3 blocks (~50 mins each) separated by 2 breaks (~10 mins each)

### April 1

#### ***Introduction to Music Mind & Brain: Part 1***

- Course Overview
- Syllabus & Requirements
- Learning Tools
- Functional Brain Organization in Relation to Emotion & Meaning in Music

### April 8

#### ***Introduction to Music Mind & Brain: Part 2***

- Review of Week I Reading & Homework
- Human Neuroanatomy: Key Terms & Structures
- Conceptual Approaches to Understanding Mind-Brain Correlates
- Experimental Methods for Studying Mind-Brain Correlates

#### APRIL 10 - Study List becomes official. LAST DAY:

1. To DROP impacted courses
2. To change Study List (add, drop courses) without fee through MyUCLA
3. To enroll in courses for credit without late Study List fee through MyUCLA
4. To check wait lists for courses through MyUCLA
5. To file advancement to candidacy petition for master's degree with major department
6. To file graduate leave of absence with Graduate Division Academic Services
7. To submit filing fee application to Graduate Division Academic Services
8. To file undergraduate request for tuition reduction with College or school
9. To declare bachelor's degree candidacy for current term (with fee depending on units completed--see "Degree Policies" in the Academic Policies section for details)

10. For full refund on textbooks with UCLA Store receipt (exception made with proof of drop or withdrawal up to eighth week)

### **April 15**

#### ***Introduction to Music Mind & Brain: Part 3***

- Pictures of Sound
- Digital Music Technology: Sound Recording, Analysis, & Editing<sup>†</sup>
  - Psychoacoustics
- Western Music Theory

#### **APRIL 17 – LAST DAY:**

1. For all undergraduate students to ADD courses with per-course fee through MyUCLA
2. For undergraduate and graduate students to file late Study List with fee
3. Undergraduates approved for reduced tuition are audited (must be enrolled in 10 units or less to be eligible for reduction) as of this date
4. Last day to submit UC intercampus exchange application to Graduate Division Academic Services
5. Financial aid census date; enrolled units verified to determine eligibility for the term Summer Session A Summer Session C

### **April 22**

#### ***Seminar I: Pitch Perception***

- Psychoacoustics of Pitch Perception: Simple Pitch vs. Complex Pitch
  - Neural Coding of Pitch by Auditory Neurons in the Ear & Brain
  - Functional Neuroanatomy: Cortical Lesion Effects

#### **April 24 – LAST DAY:**

1. For all undergraduates to DROP nonimpacted courses without a transcript notation with per-transaction fee through MyUCLA
2. Undergraduate course materials fees (including IEI fee) are assessed based on enrollment on Friday of fourth week (see "Miscellaneous Fees")

### **April 29**

#### ***Seminar II: Harmony Perception***

- Neural Coding of Harmony by Auditory Neurons in the Ear & Brain
- Cerebral Lateralization: Split-Brain Studies of Harmony Perception

### **May 6**

#### ***Seminar III: Melody Perception***

- Cognitive Psychology: The Magical Number  $7 \pm 2$  & Memory for Melodies
  - Functional Neuroanatomy: Cortical Lesion Effects
  - Melody Recognition & Aging

#### **May 8 – LAST DAY:**

Last day for undergraduates to change grading basis (optional P/NP) with per-transaction fee through URSA

**May 13**

***Seminar IV: Rhythm Perception & Production\****

- Overview
- Functional Neuroanatomy: fMRI
- Neurophysiology: Cortical Magnetoencephalography

**May 15 – LAST DAY:**

For Letters and Science undergraduates to DROP nonimpacted courses with transcript notation and per-course fee through URSA

**May 20**

***Seminar V: Music, Health & Medicine***

- Pain & Stress
- Movement in Parkinson Disease & other Brain Disorders
  - Music & Exercise in Healthy Children & Adults
  - Music & Psychopathology

**May 27**

***Seminar VI: Music Imagery<sup>†</sup>***

- Cognitive Psychology of Imagery
- Functional Neuroanatomy: PET & fMRI
  - Cortical Neurophysiology: qEEG

**June 3**

***Seminar VII: Talent, Intelligence & Creativity\*\****

- Gross Neuroanatomy: "Perfect" Pitch
- Functional Neuroanatomy: fMRI
- Creativity in Songwriters, Rock Stars, & Everyday Life

**June 5 – LAST DAY:**

1. For Letters and Science undergraduates to DROP nonimpacted courses by petition with instructor approval, per-course fee, and transcript notation
2. For graduate students to change grading basis (optional S/U) with per-course fee through MyUCLA
3. For graduate students to ADD/DROP courses with per-course fee through MyUCLA

**June 8-12: FINAL EXAMINATION WEEK**

**END**