

CLPS 2410: Auditory Neuroscience

Spring Semester 2012-13

Instructors:

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Course Description:

This course will provide graduate students with a basic grounding in the neuroscience of hearing. Topics to be covered include development, structure and function of the inner ear; ascending and descending neural circuitry for transmission and analysis of complex auditory signals; and physiological correlates of auditory phenomena.

Prerequisites: CLPS 2400 or NEUR 2050

Course requirements: Evaluation will be based on class participation (10%), written (2-3 pages) analyses of weekly readings (40%), a research proposal (30%), and a final examination (20%).

Readings:

Each week, students are responsible for reading relevant chapters from the Springer Handbook for Auditory Research (SHAR). The assignment for each class is then to identify and write a short analysis of a more recent primary research article on that topic. Class discussions will center around new lines of research stemming from the SHAR chapters, and students will be expected to contribute to the discussion on the basis of the additional articles they have read.

Schedule:

Week 1: Introduction; basics of physical acoustics

Week 2: Evolution of the inner ear

SHAR vol. 22, chapters 1 and 3

Week 3: Development of the inner ear

SHAR vol. 26, chapters 2 and 3

Week 4: Hair cells: structure and operation

SHAR vol. 27, chapters 3 and 5

Week 5: Hair cells: regeneration and repair

SHAR vol. 33, chapters 1 and 5

Week 6: Cochlear mechanics

SHAR vol. 8, chapters 4 and 5

Week 7: The cochlear amplifier

SHAR vol. 8, chapter 7

Week 8: Cochlear innervation

SHAR vol. 8, chapter 8

Week 9: Cochlear nucleus

SHAR vol 15, chapter 5

Week 10: Sound localization

SHAR vol 15, chapters 3 and 8

Week 11: Feature coding in the brainstem

SHAR vol. 15, chapter 7

Week 12: Thalamus and cortex

SHAR vol. 15, chapter 9

Week 13: Physiological correlates of pitch and timbre

SHAR vol. 24, chapter 3