Outline: Systems and cognitive neuroscience are concerned with relating the structure and function of the nervous system to behavior. Areas of study include computation in single neurons and networks of neurons, object recognition, reconstructing space, making decisions, moving, and perceiving stimuli. This course surveys recent debates in some of these areas.

Each week, an instructor assigns two or more papers, chosen to highlight timely questions or opposing points of view. A pair of students presents the papers and leads a debate over the relative merits of the conflicting viewpoints. The format is flexible, but should lean heavily on a “chalk talk” format, in which the presenters outline the relevant background, describe key points of the papers, and speculate about how further progress could be made. At the end of the course, students submit a paper about a debate (one not presented during the course), written in the style of an opinion piece with sufficient references.

Guidelines for presentations will be provided, and written feedback will be given for each presenter. All students should read the papers thoroughly (as well as relevant citations therein), and are expected to contribute to what should be a lively and fun discussion!

Schedule:

- Jan. 3, WBSB 811: Jeremiah Cohen
  - Organization, elements of scientific debates, principles of chalk talks

- Jan. 10, WBSB 811: Chris Fetsch (Challenges and pitfalls of interpreting causal manipulations)

- Jan. 17, WBSB 811: Jim Knierim (Do hippocampal cells show spatial tuning in 2D virtual reality?)
• Jan. 24, WBSB 811: Jeremiah Cohen (Is working memory encoded in persistent activity of individual neurons?)
• Feb. 7, WBSB 811: Jeremiah Cohen (How are value-based decisions weighed in neurons?)
• Feb. 14, WBSB 811: Dan O’Connor (Is choice-related activity really just body-kinematics-related activity, or is the distinction semantics?)
• Feb. 21, WBSB 811: Kristina Nielsen (Species differences in V1 organization)
• Feb. 28, WBSB 811: Solange Brown (Predictive versus bottom-up coding)

• Mar. 14, WBSB 811: Ed Connor

**Prerequisites:** Neuroscience & Cognition II or permission of director.

**Grading:** Chalk talk (30%), participation (30%), final paper (40%).

**Course Policy:** Missed sessions can be made up by writing a 4-5 page essay on the debate of the week. Students with disabilities who require accommodations for this course should contact Catherine L. Will, Disability Services Coordinator for Graduate Biomedical Education (cwill@jhmi.edu or 410-614-3781) at their earliest convenience to discuss their specific needs.