

Topics in Neurobiology and Behavior: Plasticity of the Nervous System

Spring 2016, Mondays 2:10-4pm

200 C Schermerhorn

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Office hours: Monday 1pm-2pm, 4pm-5pm

Course Overview: This seminar provides an overview of the mechanisms and behaviors associated with neural plasticity. Students will obtain a basic working knowledge of the different types of neural plasticity, and how these affect cognition and behaviors. Topics will vary weekly, and different scientific literature from different journal articles that are associated with the weekly topics will be interpreted and discussed. The topics to be addressed range from developmental, to structural, functional, and to injury and activity induced plasticity. The journal articles will encompass data collected from both human and non-human models. Upon successful completion of this seminar, students will be better able to evaluate and critique scientific literature. In addition, this course will prepare students to approach scientific questions with vigor and validity, and therefore, be better at objective, critical and analytical thinking.

Course Prerequisite: PSYC W1001 and/or PSYC W1010 is required, plus permission of the instructor.

Course Format: Basic background concepts of the very diverse fields of plasticity of the nervous system will be presented, and serve as the core knowledge associated with the weekly topics. For the weekly topics, reading assignments will consist of scientific literature from journals relevant for Psychology and Neuroscience. Readings will be made available through CourseWorks. Most of the classes will consist of a lecture overview of the relevant topic followed by presentations and discussions of the readings. A final paper will be required. This paper will be written similar to that of a scientific review article. Based on students' interests, students can choose their own topic for the final paper. A brief presentation by each student on their final paper will be required.

Course Requirements: See below

Weekly readings/and submission of comments/questions/thoughts (25%) - each student is expected to read the assigned scientific articles for every class. By 5pm the day before each class, each student is expected to post substantial comment(s), question(s), or thought(s) on the research article to be discussed during class the following day. Your postings will be made, and available to view, on the course's Discussion Board of CourseWorks.

Presentation of assigned research article (25%) – each week, at least 1 student will present on one assigned article. The presentation should consist of the use of slides, and the student presenting will lead the discussion of the scientific paper. Based on current enrollment, which may change, each student will give one presentation on an assigned research article.

Review Paper (30%) – A final review paper is required. This paper can consist of any topic of your choosing that we have discussed during the semester. Students will have gained familiarity of review articles throughout the course, because many of the assigned readings will consist of review articles along with scientific research articles. You are expected to inform the professor of the topic you plan on writing about, and your review paper will be submitted at the beginning of class on April 25. Papers are expected to be between 8 – 12 pages.

Presentation of review papers (10%) – each student will be expected to give a brief presentation on their review paper. The presentation should consist of the use of slides, and consist of “summarizing” the topic you have chosen for your review paper.

Class participation (10%) –students are expected to attend every class session and participate in discussions.

Course Schedule: See below

*Please note that readings and topics may be subject to change based on student enrollment and preferences. In addition, January 18th is a holiday so the university was closed and no classes were held.

Week 1 (January 25): Introduction and Overview

Week 2 (February 1): Cortical Maps
Presenter: Tina Kao

Week 3 (February 8): Compensation Properties of the Brain
Presenter: Tina Kao

Week 4 (February 15): Behavioral Implications of Brain Injury
Student Presenter: David Peprah

Week 5 (February 22): Dynamic Properties of Myelin
Student Presenter: Maithreyi Raman

Week 6 (February 29): Neurogenesis and Synaptic Plasticity
Student Presenter: Pegah Khosravi-Kamrani

Week 7 (March 7): Prenatal Toxins on Postnatal Behaviors
Student Presenter: Christopher Lites

Week 8 (March 14): SPRING BREAK

Week 9 (March 21): Plasticity of Sensory Gating and Implications for Schizophrenia
Presenter: Tina Kao

Week 10 (March 28): Aging or Plasticity?

Student Presenter: Stephanie Ding

Week 11 (April 4): Neural Plasticity Associated with Stimulation Techniques, Emphasis on Parkinson's Disease

Week 12 (April 11): Emotions – Effects of Fear Conditioning on the Sensory Systems

Week 13 (April 18): Reprogramming Neuronal Circuits for Treating Addiction

Week 14 (April 25): Changes in Molecular Mechanisms Associated with Stress, Emphasis on Post-Traumatic Stress Disorder

***Review Paper due at the beginning of class**

Week 15 (May 2): Student Presentations on Review Papers