Integrative Neuroscience BIOL/PSY 474/674 Syllabus: Spring 2017

Dr. Grant Mastick, Biology, gmastick@unr.edu
Dr. Gideon Caplovitz, Psychology, gcaplovitz@unr.edu
Office hours: By appointment.

3 credit hours; The course is designed for two sessions of 75 minutes per week. Course enrollment cap: 35 students. (Additional discussion sections may be expanded in future years, if TAs are available to support grading of assignments.)

Course prerequisites:
Junior or senior standing; Completion of general education CO1-8 courses. Additional prerequisite: BIOL 475 Neurobiology or PSY 403 Physiological Psychology. This course will be appropriate for junior or senior Neuroscience majors, and for prepared Psychology, Biology, and other majors, and graduate students in Neuroscience and related areas.

Course description.
The goal of this course will be to integrate concepts and knowledge across the field of neuroscience. Neuroscience is an interdisciplinary field which draws on a wide range of scientific disciplines to understand how the brain functions. The underlying philosophy of the course is to encourage intellectual engagement, critical thinking, and communication skills to develop advanced-level understanding of neuroscience topics. An emphasis of the course is on the student’s ability to communication scientific information and arguments effectively.

This course will satisfy CO13:
Core objective 13: Integration and Synthesis. Students will be able to integrate and synthesize Core knowledge, enabling them to analyze open-ended problems or complex issues.

Student learning objectives. Students will be able to:
SLO1: Integrate concepts, theories, and methods across a wide range of disciplines to analyze specific research questions and case studies in neuroscience. (CO13)
SLO2: Demonstrate mastery of CO1-3 skills (composition, quantitative reasoning, and critical analysis) to explain and criticize primary research literature in neuroscience, while also developing and integrating CO9 skills to distinguish between sound and unsound interpretations of scientific information. (CO9, CO13)
SLO3: Demonstrate the ability to synthesize a range of information for a complex issue in neuroscience (structure, function, behavior, or disease). (CO13)

Course organization: How to succeed in the Integrative Neuroscience course:
Attendance: Required. Come to class prepared. Grading will include unnannounced quizzes, in class assignments. Contributions to class discussion will also be a major aspect of the course, and attendance is essential for discussion sessions.
**Classroom Activities:** It is important that you prepare by reading the assigned chapters and research articles before coming to class to benefit fully from the class activities.

**Review daily.** Research has shown that most people soon forget almost all of what they hear in a lecture. However, retention is much better for people who review the information within 24 hours. Thus, the single most beneficial way to help your grade is to review your notes after every class. Be proactive and schedule time for review.

**Required Textbook:** Kandel, Principles of Neuroscience, 5th edition.

**Assignments and Grading:**

**Pre-class quizzes:** assessment of student preparation: 10%. Quizzes or other assignments to assess level of student preparation, based on assigned reading (textbook, review articles, etc.)

**Projects:** 40%. Several writing and presentation assignments will be required. These assignments will require synthesizing information from this course and prior neuroscience and other courses. These assignments will also require integration across levels of neuroscience.

**Case studies:** Neurological patient cases: Starting with a case study, explain a specific neurological disorder, describe potential symptoms and diagnostic tests, and evaluate current and potential treatments. Alternatively, interview a subject with a neurological condition, and write a summary of the potential neuroscience background and treatments. Case studies will address ethical issues, including impact of the disorder on patients, caregivers, and society. Case study assignments will include both written and video formats to encourage diverse communication skills.

**Brain Facts:** Write a popular press article (in non-technical language) that summarizes a neuroscience topic and recent research advances. The format and length will follow the Brain Facts published by the Society for Neuroscience.

**Mini-proposal:** Pose a novel research hypothesis on a significant neuroscience problem. Written assignments will help students prepare and organize these oral presentations, which will propose integrative approaches to test hypotheses. Students will also develop analytical skills by critically reviewing the mini-proposals of other students.

**Class discussion:** 50%.

A major component of the class will be discussion of neuroscience research papers, including classic studies and the latest research. One class a week will be dedicated to in-class discussions of primary research articles. Discussions will be designed to engage students in class, through a combination of critical thinking assignments, student presentations, and small group exercises. Students will gain experience in critical analysis of neuroscience research papers, providing insights into both historical approaches and cutting edge technology. Discussions will focus on principles of experimental design to test hypotheses using approaches from a wide range of disciplines. Discussions will sharpen critical thinking skills to encourage the
development of logical and quantitative reasoning. Communication skills and creativity will be encouraged in class discussions to facilitate the synthesis of information and to develop new ideas.

The quality of class discussion critically depends on student preparation and active participation. Each student is expected to make critical comments, ask informed questions, and aid in the flow of the discussion.

Final exam. Students will prepare critical evaluations of mini-proposal presentations.

Lateness Policy: The number of points earned on an essay assignment will be reduced by 10% of the total possible number of points for each unexcused school day passed since the assignment’s due date (e.g., Saturdays and Sundays will not count). No unexcused assignments will be accepted more than 1 week late.

Grading scale: Based on percentage of the total points for the course. Check your progress in "My Grades".

The tentative grading scale will be A (92%+), A- (90-91%), B+ (88-89%), B (82-87%), B- (80-81%), C+ (78-79%), C (70-77%), D (60-69%), F (<60%). The instructor(s) reserves the right to change the final grading scale.

BIOL/PSY 674: For graduate students enrolled in the course at the 600 level, the grading will be separate than for the undergraduate course. The expectations for depth of discussion and clarity of communication on assignments are higher than those for undergraduates. Additional assignments, such as independent reading, reporting on the primary literature, and mentoring or leading class discussions will be required for graduate students throughout the course.

Statement of Academic Dishonesty: “Cheating, plagiarism or otherwise obtaining grades under false pretenses” constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student’s enrollment without a grade, giving an F for the course or for the assignment. For more details, see the UNR General Catalog.

Statement of Disability Services: Any student with a disability needing academic adjustments or accommodations are strongly encouraged to speak with the instructor or the Disability Resource Center (Thompson Building, Suite 101) as soon as possible to arrange for appropriate accommodations.

Statement for Academic Success Services: Your student fees cover usage of the Math Center (784-443 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring/), and University Writing Center (784-6030 or http://www.unr.edu/writing_center/). These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign a responsible and successful student.
Statement on Audio and Video Recording: Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.