The Neurobiology of Learning & Memory
(PSYC 222OL)
Summer 2012

Instructor
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Dewey Hall 304
Office Hours: By appointment
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Meeting Time
July 2, 2012 to Aug 10, 2012

Prerequisites
Biopsychology (PSYC 121), Physiological Psychology (PSYC 221) or Instructor’s permission

Course Summary
This course will survey the fundamental concepts, facts and methodologies for examining how the brain learns and remembers information. Discussions will focus on the molecular-, cellular- and neurobiological systems-level approaches that are used to investigate memory formation, retention and expression. Memory neuropathology will also be discussed.

Learning Goals
Memories contain information about our past, help us engage in the present, and plan for the future. The goal of this course is to gain an appreciation and understanding about the neurobiological basis of memory formation and expression.

Learning Outcomes
By the completion of this course students will:
- Know the cellular mechanisms that can strengthen synapses.
- Know the major molecules and brain areas (e.g., hippocampus, amygdala, cerebellum, neocortex) that are involved in different forms of learning.
- Know how animal and human research is used to investigate the neurobiological mechanisms of learning.
- Understand how animal research is pivotal to unlocking the mysteries of brain function.
- Understand how to locate, summarize and integrate findings obtained from peer-reviewed publications.
- Be able to think critically about research
- Exercise peer interactions

General Structure of the Class
Video lectures will cover important topics in the textbook, including concepts and key experiments, and will I add supplementary information. This course will also maintain an active
online discussion board as a platform for students to interact with one another. I expect students to take an active role in this course by posing and (hopefully) answering questions.

Textbook

Course Grading Breakdown
Exam 1 - 20%
Exam 2 - 20%
Exam 3 - 20%
Literature Review Paper: 20%
Class Discussion Participation - 10%
Student-Authored Exam Questions: 10%

Course Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
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<tbody>
<tr>
<td>A+</td>
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<tr>
<td>A</td>
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<td>C-</td>
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<td>D+</td>
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<td>F</td>
<td>&lt;60%</td>
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Exams
Exam format generally will be multiple-choice and short answer. Exams will cover lectures, assigned readings and other posted videos. Exams are not cumulative in content per se, but are cumulative conceptually. Make-up exams must be arranged with the instructor at least 48 hours prior to the exam. In the event of an illness, make-up exams will be administered only if a medical excuse is provided by the Dean’s office. If you have a medical condition that may interfere with taking an exam sometime in the semester, you must contact me in the first week of class to discuss it.

Literature Review Paper
Students will be required to write a short literature review paper (5-6 pages) citing at least 5 empirical peer-reviewed journal articles. At least 2 cited references need to be published within the last 2 years. You should select a topic that relates to the neurobiology of learning in some meaningful way (e.g., a disease that affects memory). Your topic must be approved by me by the third week of class. Your paper is due by 11:59pm on Aug 6.

Student-Authored Exam Questions
Most weeks (= weeks 1-5) during this course you will be required to author and submit TWO exam questions derived from the material covered that week. These can be multiple choice (with 5 choice options), short answer, or essay questions. You will also need to provide an answer for each question you submit. Quality, correctness, originally, and thoughtfulness of your question are important. Your lowest score will be dropped from grading. Up to 5 points will be award for each question you submit (= 10 points each week due). “Outstanding” questions worth 5 points; “good” questions worth 4 points; “Fair” questions worth 3 points; “Poor” questions worth 2 pts; No questions worth 0 points. Student-authored exam questions need to be submitted by midnight on the due date. This assignment helps to ensure that to you keep current
on course material.

**Late Policy**
Late assignments will be accepted, however you will automatically lose 10% each day that the assignment is late. After 5 days late your assignment will continue to be worth up to half credit.

**Paper Discussions**
An online discussion of a recent empirical and/or other current press release in the media related to the neurobiology of memory will occur twice during this course. I’m happy to consider papers recommend by students, so please keep your eyes and brain on alert when perusing the news for interesting articles related to our select topic of the neurobiology of learning. Let me know if you find something of particular interest!

**Student Learning Accommodations**
If you have a formal accommodation plan developed in conjunction with UVMs ACCESS Office or would like to discuss the supports that you need in order to learn well in this class, please contact me in the beginning of the semester. Adaptations and instructional supports are available through consultation with the instructor and the ACCESS Office.

ACCESS Office: [www.uvm.edu/~access/](http://www.uvm.edu/~access/)

UVM’s policy on disability certification and student support: [www.uvm.edu/~uvmppg/ppg/student/disability.pdf](http://www.uvm.edu/~uvmppg/ppg/student/disability.pdf)

**Religious Holidays**
Students have the right to practice the religion of their choice. If you need to miss class to observe a religious holiday, please submit the dates of your absence to me in writing by the end of the second full week of classes. You will be permitted to make up work within a mutually agreed-upon time.

**Academic Integrity**
The policy addresses plagiarism, fabrication, collusion, and cheating. [www.uvm.edu/~uvmppg/ppg/student/acadintegrity.pdf](http://www.uvm.edu/~uvmppg/ppg/student/acadintegrity.pdf)

**Grade Appeals**
If you would like to contest a grade, please follow the procedures outlined in this policy: [www.uvm.edu/~uvmppg/ppg/student/gradeappeals.pdf](http://www.uvm.edu/~uvmppg/ppg/student/gradeappeals.pdf)

**Grading**
For information on grading and GPA calculation, go to [www.uvm.edu/academics/catalogue](http://www.uvm.edu/academics/catalogue) and click on Policies for an A-Z listing.

**Code of Student Rights and Responsibilities** [www.uvm.edu/~uvmppg/ppg/student/studentcode.pdf](http://www.uvm.edu/~uvmppg/ppg/student/studentcode.pdf)
FERPA Rights Disclosure
The purpose of this policy is to communicate the rights of students regarding access to, and privacy of their student educational records as provided for in the Family Educational Rights and Privacy Act (FERPA) of 1974. http://www.uvm.edu/~uvmppg/ppg/student/ferpa.pdf

Class Schedule
Every effort will be made to stay on schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topics</th>
<th>Readings</th>
<th>Assignment (Due Date)</th>
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<tr>
<td>1</td>
<td>July 2 – July 6 (no class July 4)</td>
<td>Course Overview and Foundations</td>
<td>Chapters 1-2</td>
<td>Practice Assignment (July 3)</td>
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<td>Synaptic Plasticity</td>
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<td>Exam Questions (July 6)</td>
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<td>Long-Term Potentiation</td>
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<td>Chapters 3-6</td>
<td>Discussion Post (July 12)</td>
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<td>Calcium Signaling</td>
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<td>Chapters 7-8</td>
<td>Term Paper Topic (July 18)</td>
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<td>Studying Memory in Animals &amp; Humans</td>
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<td>Exam Questions (July 20)</td>
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<td>Biological Basis of Memory Formation</td>
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<td>Memory Consolidation</td>
<td>Chapters 9-11</td>
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