

PSB 4810
Neurobiology of Learning and Memory

Section: #214G; **Class:** #29752

class time: Tuesday period 3, 9:35 – 10:25 a.m. McCarty A, room MCCA 1142
Thursday periods 3-4, 9:35 - 11:30 a.m. Florida Gym, room FLG 0220

Professor: Darragh P. Devine, Ph.D.

dpdevine@ufl.edu

273-2174

Office hours: Tuesday 10:40 - 11:30 a.m. and Friday 9:35 - 10:25 a.m.

Tuesday office hours are in-person in the Psychology Building, room PSY 337

Friday office hours are online at: Meeting ID: 926 3698 0699, Passcode: neuro

Teaching Assistant (TA): Sara Pickernell, M.S.

spickernell@ufl.edu

Office hours: Wednesday 9:35 - 10:25 a.m. and Thursday 11:45 a.m. - 12:35 p.m.

Wednesday office hours are online at: Meeting ID: 951 8812 1782, Passcode: neuro

Thursday office hours are in-person in the Psychology Building, room PSY 311H

Required Text: Jerry W. Rudy *The Neurobiology of Learning and Memory* 2nd edition, ISBN # 978-1-60535-230-5. **Note – Do not purchase the first or third edition. The textbook was extensively revised specifically for the second edition.**

COURSE OBJECTIVES: Human psychological function may be construed as the sum of stored experience interacting with current sensation and awareness. Learning and memory - the encoding, storage, and retrieval of that experience impact upon our motivations and emotions, and influence our current perceptions and behavioural responses to our environment. The purpose of this course is to provide a broad background in the neural basis of learning and memory. How are development and learning related? How do they differ? How is plasticity encoded in neurons? What are the cellular and molecular mechanisms of plasticity? Where and how are memories distributed and stored in the brain? How are they retrieved? We will examine these issues from a variety of perspectives - historical, developmental, genetic, pharmacological, electrophysiological.

GRADING: These courses will have three take-home exams and one optional final exam. Each take-home exam will consist of a combination of multiple choice and short essay questions. Each take-home exam will cover only the text and lecture material from the chapters that have most recently been discussed in class. The final exam will be comprehensive (i.e. all the chapters that are covered during the semester). Students will receive a grade based upon the exams.

Each of the take-home exams will count 33 $\frac{1}{3}$ % toward your final grade. If you perform adequately on all take-home exams and are satisfied with your grade, you may skip the final exam. If you fail to turn in a take-home exam on time, or if you do poorly on an exam, you can drop that exam/grade and take the final exam to replace it. In this case your three *best* exam scores will each count 33 $\frac{1}{3}$ % of your total grade.

The final is the only option for a missed or failed exam. There will be no additional makeup tests under any circumstances. A penalty of 10% per day will be imposed for any examination that is turned in late.

The grading scheme is as follows:

A	93-100	C	73-76
A-	90-92	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	E	<60

A grade of C- or lower will not be a qualifying grade for major, minor, Gen Ed, Gordon Rule or College Basic Distribution credit.

Attendance: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. [Click here to read the university attendance policies.](#)

COURSE SCHEDULE: (This is a provisional and very ambitious schedule. The timing of topics covered may change, and coverage of some chapters may be adjusted as needed. Therefore, the topics assigned to examinations will be adjusted accordingly – details will be described in class. The dates of exams will not change.)

For critical semester dates see <http://www.registrar.ufl.edu>

Approx. Dates Chapter and Topic *

PART 1 – SYNAPTIC BASIS OF MEMORIES

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|---------------|-----------------------------------------------------------------------|
| Aug 24-29 | 1. Introduction: Fundamental Concepts and Historical Foundations |
| Aug 31-Sept 7 | 2. Mechanisms of Synaptic Plasticity: Introduction |
| Sept 12-14 | 3. Modifying Synapses: Central Concepts |
| Sept 19-21 | 4. Generating and Stabilizing the Trace: Post-Translational Processes |
| Sept 26-28 | 5. Consolidating Synaptic Changes: Translation and Transcription |
| Oct 2 | optional review session – room TBA, 12:50-1:40 p.m. |
| Oct 3 | Exam #1: Chapters 1-5 (all material covered to date) |
| Oct 5 | 6. Consolidating Synaptic Changes: Specific Mechanisms |
| Oct 10 | 7. Maintaining the Consolidated Trace |
| Oct 12 | 8. Toward a Synthesis |
| Oct 17 | 9. Making Memories: Conceptual Issues and Methods |
| Oct 19 | 10. Memory Formation: Early Stages |

PART 2 – MOLECULES AND MEMORIES

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| Oct 24-26 | 11. Memory Consolidation |
| Oct 30 | optional review session – room TBA, 12:50-1:40 p.m. |
| Oct 31 | Exam #2: Chapters 6-11 (all material covered after exam #1) |
| Nov 2 | 12. Memory Maintenance and Forgetting |
| Nov 7 | 13. Memory Modulation Systems |
| Nov 9 | 14. The Fate of Retrieved Memories |

PART 3 – NEURAL SYSTEMS AND MEMORY

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|------------------|-------------------------------------------------------------------------------------|
| Nov 14 | 15. Memory Systems and the Hippocampus |
| Nov 16 | 16. The Hippocampus Index and Episodic Memory |
| Nov 21 | 17. The MTH System: Episodic Memory, Semantic Memory, and Ribot's Law |
| Nov 23 | Thanksgiving – no class |
| Nov 28 | 18. Actions, Habits, and the Cortico-Striatal System |
| Nov 30 | 19. Learning about Danger: The Neurobiology of Fear Memories |
| Dec 4 | optional review session – room TBA, 12:50-1:40 p.m. |
| Dec 5 | Exam #3: Chapters 12-19 (all material covered after exam #2) |
| Dec 11-15 | Exam #4: optional comprehensive final exam (day and time not yet determined) |

ADDITIONAL SUPPORT FOR STUDENTS WITH DISABILITIES: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. [Click here to get started with the Disability Resource Center](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

ACADEMIC HONESTY GUIDELINES: UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. [Click here to read the Conduct Code](#). If you have any questions or concerns, please consult with the instructor or TAs in this class.

In-Class Recording: Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Campus Resources - Health and Wellness:

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).

University Police Department: [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road,

Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-273-4450.

Campus Resources - Academic:

E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)

On-Line Students Complaints: [View the Distance Learning Student Complaint Process.](#)