

PSY:COG

Class Times: F 12:30-2:30pm in Preston 121 | Office Hours: W 2:15-3:15pm/F 4-5pm/by appointment

Instructor

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 (preferred contact)

Course Materials

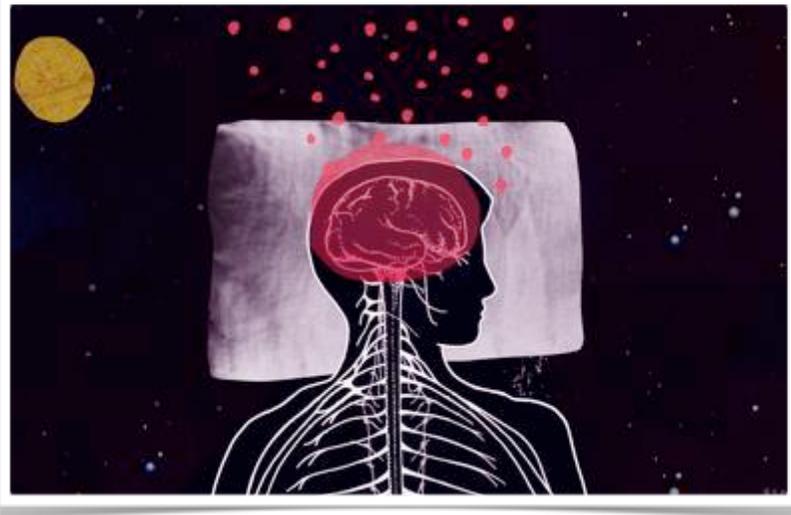
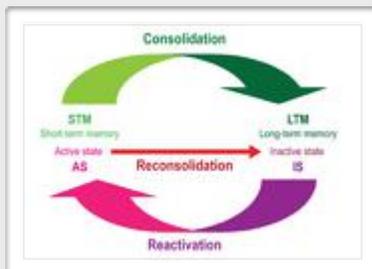
Course materials will be posted on **Moodle2** (see footer for URL & access code).

Prerequisites

This course is open to first-, second-, and third-year students. It typically requires a two-semester commitment or the permission of the instructor.

Assessment

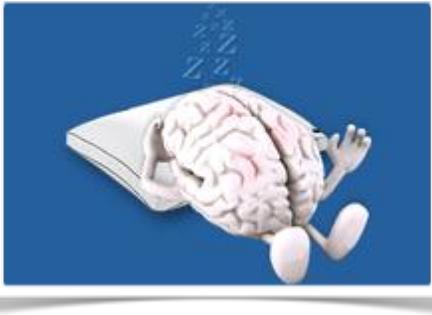
- Lab work: **70%**
- Final paper: **30%**



Course Overview

In this course, students will gain experience working in a cognitive neuroscience laboratory. Using controlled experiments and brainwave recordings, we will investigate the cognitive processes that allow for the adaptive encoding, consolidation, retrieval, and forgetting of associative memories. Students will participate in all phases of the research process including experiment design, stimulus development, programming, data collection, analysis, and presentation.

Scientific research is a process, one that requires creativity, attention to detail, a healthy dose of skepticism, and--importantly--perseverance. To get the most out of this experience, the course generally requires a two-semester commitment. This timeline mimics the Senior Project, with the goal of allowing you to contribute to each stage of the research process. The more you contribute along the way, the more you stand to gain. By taking the initiative and putting in extra time/energy, you may see doors open to additional opportunities like authorship on publications, paid research assistantships, graduate programs, and the likes. Gaining



Learning Objectives

Coming out of this two-semester sequence, you should have:

- Developed a more nuanced appreciation for the primary research methods and theories used to investigate the interplay between sleep and memory.
- An enhanced ability to read, synthesize, and contribute to the relevant psychological literature.
- First-hand experience designing, implementing, and analyzing a research protocol in a cognitive neuroscience laboratory.
- The necessary skills to program a basic experiment and begin to interpret EEG data.
- Had opportunities to present your work to the scientific community.
- A better sense of the nuts and bolts of psychological research and how those skills can be applied to the Senior Project and beyond.

expertise with computer programming or particular pieces of equipment/methodologies may mean more possibilities for your Senior Project or independent study. That said, a *minimal commitment of 3 hours per week is required outside of times devoted to our scheduled meetings and assigned readings*. This may come in the form of “homework” (e.g., conducting a literature review online or in the library) or time working independently (or in groups) in the lab (e.g., programming experiments, testing equipment, scheduling participants, running the experiment, analyzing data, etc.).

Research Question

How does the brain prioritize memories that are likely to be pertinent in the future over those that might otherwise distract us? The proposed research aims to address this question by testing the usefulness of different types of reminders in different cognitive states. Just as certain smells or sounds we encounter in daily life may bring to mind events that happened long ago, evidence suggests that such reminders have the potential to stimulate memories of the past even while we are asleep. Reminders like these have been shown to have lasting consequences on the accessibility of valuable memories, often facilitating their later retrieval (Stickgold, 2007). Reminders of unwanted memories, however, may instead lead individuals to suppress them, reducing their accessibility going forward (Anderson & Green, 2001). Similarly, asking individuals to forget learned information impairs memory even if the information again becomes relevant (Bjork, 1998). These latter two results—observed during wakefulness—implicate conscious processes that facilitate useful memories and dampen distracting ones. Presently, we ask whether similar reminders during a state of temporary unconsciousness (short naps) would continue to dampen previously deprioritized memories or allow them to recover (cf. Oudiette et al., 2013). Brainwave recordings will be used to identify the components of sleep/wakefulness associated with these outcomes. Our work may have implications for strategies to better remember what we wish to remember and forget what we wish to forget—even while we sleep.



Best Practices

To make the most of office hours, it is recommended that you:

- Avoid waiting until the last minute (before an exam or due date) to attend. Seeking extra help or clarification well in advance of deadlines will leave you plenty of time to act on advice discussed.
- Email the instructor in advance or bring with you a concise list of topics/questions you wish to discuss, if possible. Itemizing in this way helps ensure all your questions are addressed and saves you time in the long run. That said, *dropping by for a spontaneous, broader chat is also most welcome*. Tea and/or coffee will be available.

When emailing the instructor, keep in mind that:

- Taking the time to draft a concise message with proper spelling/punctuation is appreciated and will be met with a similarly considered reply.

Writing/other academic help is available through [Bard Learning Commons \(lc@bard.edu\)](http://Bard Learning Commons (lc@bard.edu)).

Joint Responsibilities

Achieving the broad aims of this course requires commitments from instructor and students alike. Below you will find an outline of some of those responsibilities.

- **Your instructor agrees to...**
 - a) Make himself available outside of class during posted office hours (and by appointment, as necessary) to answer questions, provide extra help, and discuss matters related to the course of study.
 - b) Respond in a timely fashion (typically by the end of the next school day) to email queries. In the event that more time is required to fully address the student query, the instructor will acknowledge receipt of the email and provide the student with an estimated response time.
 - c) Facilitate a thoughtful, considerate, and engaging learning/research environment.
 - d) Create and welcome opportunities for students to provide feedback throughout the semester.
- **You are responsible for...**
 - a) Showing up regularly, on time, and prepared.
 - b) Keeping up with the assignments and readings.
 - c) Substantively participating in all areas of lab work and discussions. Note that a top-notch level of participation *does not necessitate responding to every question* raised; active or passive efforts to welcome contributions from everyone in the class are also looked upon favorably. Moreover, it is fully expected that different people will bring/develop different skill sets to the lab and some division of labor will logically follow. Still, you are encouraged to give everything you attempt your best shot--you may even find you have surprising interests or skills!
 - d) Keeping an accurate record of your time on task with various aspects of lab work. This spreadsheet will be submitted to the instructor at various points during the course.

- e) Taking care to maintain the lab space/equipment (which can be fragile and/or expensive) and respect each other (including participants).
- f) Submitting assignments on time. *A late assignment will immediately be subject to a 10% penalty, with an additional 10% penalty leveled against that assignment's score for every 24 hours it remains late. The only extensions that will be granted involve documented cases of medical or family emergency.* Students requiring course accommodations (e.g., due to disability) should contact the instructor privately as early as possible after the first class meeting.
- g) Upholding academic integrity. Plagiarism (e.g., copying other's words or ideas without proper citation) will not be tolerated. You are expected to work independently on each graded assignment, unless explicitly instructed otherwise. When in doubt as to what constitutes plagiarism within the confines of this course, you are encouraged both to consult the student handbook (<http://www.bard.edu/dosa/handbook/index.php?aid=1201&sid=705>) and to contact the instructor for further guidance. There is absolutely no penalty for asking for clarification; however, failing to abide by Bard's standards for academic integrity can result in failing the course.

Assessment Details

- **Lab work** (accounting for 70% of course grade) will account for the bulk of your time devoted to the course and, consequently, your grade. The nature of this work will vary from week to week, but it may include activities like conducting literature searches, learning how to use lab equipment/software/statistical procedures, programming experiments, recruiting/scheduling participants, running experiments, cleaning up after experiments, and analyzing data. As mentioned above, it is fully expected that different people will bring/develop different skill sets to the lab and some division of labor will logically follow. Still, you are encouraged to give everything you attempt your best shot--you may even find you have surprising interests or skills!
- You are required to keep an accurate record of your time on task with various aspects of lab work. This *spreadsheet will be submitted via Moodle by 12:30pm each Friday* we meet.

Regular failures to submit the spreadsheet on time will result in a significant grade penalty. While *this log must, at a minimum, contain dates, duration of work, and brief description of activities performed* (e.g., programming experiment, scheduling participants, etc.), you should use additional fields for notes/revelations that came up along the way [e.g., “discovered a bug in the code (line #36-67 of first_phase.m) due to an unclosed for-loop; fixed bug, but this affected the first 5 participants’ data, which should be excluded”]. Ideally, this record should be useful to you, as well as a way for your instructor to check in on your progress. Your log should reflect *at least 3 hours per week* (on average--some weeks may require more, some less) of productive lab work, NOT including our scheduled meetings and time devoted to reading assigned materials. Again, more you contribute along the way, the more you stand to gain.

- **Final paper** (*accounting for 30% of course grade*) will summarize, in written form, what you’ve learned over the course of the semester and what we might want to alter (in the experiment or otherwise) going forward into next semester. In addition to reflecting on the skills and insights you’ve gained, you might also want to consider possible improvements to the design/ methodology, as well as additional analyses or follow-up questions we should pursue. Moreover, it’d be helpful to have you identify research or professional skills you’d like to work on next semester. This paper (submitted *individually* via Moodle) will be due by **Friday, December 22 at 6pm.**

Background Reading

Whether you are returning or joining this course during its second semester, you should review the following materials (available on Moodle) before our second group meeting (Friday, September 15).

Scheduling Notices

October 6 (Justin presenting at LLI), November 24 (Thanksgiving Break), December 15 (Psychology Boards)

Immediate Agenda Items

- Add newcomers to sleep protocol & Google Docs
- IRB renewal request (due in time for 11/30 expiration date--deadline likely ~11/8)
- Establish internal deadlines/goals & working groups
- Equipment testing
- Research assistant training
- Recruitment & run scheduling
- Visual sleep staging
- Prepare control conditions (wake, remember, etc.)
- Identify ways to increase participant throughput