



INSTRUCTOR: Dr. Jill Leutgeb, Ph.D.

Walter F. Heiligenberg Professor of Neuroethology,
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School of Biological Sciences
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Office hour: **In person** = Fridays, 10:30-11:30 pm, TATA
Hall room 3103
Remote = Thursdays, 3:00 – 4:00 pm, via Zoom
(see Canvas for link)

COURSE DESCRIPTION: This course will include an in-depth presentation of the mechanisms for learning and memory at the molecular, cellular, and systems levels. A goal of the course is to introduce students to current topics in learning and memory research, while also learning the fundamental concepts about the **biology** of learning and memory. To reach this goal this course will also teach students to read and interpret primary research literature.

Students will approach the material through several mechanisms: 1) engaging with new material through listening, discussing, reading, and writing; 2) work with problem sets covering key concepts after each lecture; 3) synthesize understanding and develop science communication skills by distilling complex primary literature into popular science articles; and 4) exam assessment. **BIPN 148 will meet in person, Fall 2022.**

COURSE SCHEDULE: Tuesday, Thursday 9:30-10:50am, **CENTR 105** (note change of location)

See the 'BIPN 148 Course Schedule' document on Canvas for a lecture by lecture outline of course content, assignments, and exams.

WELCOME STATEMENT: Welcome to BIPN 148. This has been a challenging few years for many reasons, including the COVID-19 pandemic. As your Professor, I value your health, wellbeing, and learning. This quarter I will challenge you in this course to deepen your understanding of how the brain works in the service of memory and to grow your curiosity and critical thinking skills. However, this is not at the expense of your wellbeing. I have built flexibility into the course with that purpose. Beyond physical health, I encourage you throughout the quarter to make time for yourself to recharge, relax, and rejuvenate, which will aid in your brain's ability to encode and store new information. We will soon learn the biology behind this statement, and why you should all be trying to get enough sleep. You will see in my grading policies that I allow you to select written assignments based on differing deadlines, as well as drop several assignment scores. This will help with bandwidth for when you have challenging weeks or an occasional absence. However, if you have prolonged issues that are affecting your ability to meet the expectations of the course please communicate early on so you are aware of options that often have specific deadlines for implementation. Exam dates are not flexible so please note them in your schedules right away and follow the steps noted below for any conflicts.

INSTRUCTIONAL ASSISTANTS (IA):

Qianyi Pu	Discussion Sections	TBD	qipu@ucsd.edu
Farah Farouq	Discussion Section	TBD	ffarouq@ucsd.edu
Joshua Gillman	Discussion Section	TBD	jgillman@ucsd.edu
Adam Shi	Discussion Section	TBD	adshi@ucsd.edu
Samantha Yip	Discussion Section	TBD	s3yip@ucsd.edu

IA Office hours: See the class Canvas site for day/time listings and Location/Zoom information. Office hours will begin the week of October 3rd. There will be an office hour offered each day of the week. Additional Exam Review Sessions may not be scheduled by IAs for this course. Instead, please take advantage of weekly office hours in addition to weekly Discussion Sections. IAs will also monitor the Discussion Board daily. Therefore, there are many ways to receive additional instruction that are more productive and flexible than a typical review session.

COMMUNICATION: To ask questions about course content: attend office hours provided by Dr. Leutgeb or any of the IAs (dates/times/location listed on Canvas), or type your question at any time into the Discussion Board on Canvas. The Discussion Board is monitored daily. This mechanism is preferred to email as it allows all students to benefit from the provided answer from IAs or the Instructor. Because of the large number of students in this course, we cannot answer individual questions on course content via email and these emails will be deleted.

Communication of personal issues related to the course: Please contact the instructor directly via UCSD email rather than CANVAS mail. However, do not rely on either as a sure and immediate form of communication with the instructor. I will do my best to answer emails within two business days. Please have read the course Syllabus before sending an e-mail. Please email your IA only for procedural issues related directly to you, but not about course content. All emails to the IAs and professor should be respectful, include your first and last name in the body of the email, and have BIPN 148 in the subject line.

PREREQUISITES: Please make sure to review information about the nervous system from prerequisite BIPN 140 as well as other physiology/neuroscience classes. Students should have a strong basis in understanding neuronal signaling, including temporal and spatial summation of dendritic input, as well as changes in synaptic integration (course topics introduced in BILD2 and expanded in BIPN140). IAs will include a primer of these topics the first week of discussion section to refresh your memory.

COURSE MATERIALS

Textbook and Journal Articles

Textbook: *Memory, From Mind to Molecules*, 2nd edition, by L. R. Squire and E. R. Kandel (2010)

1) **Textbook availability:** To keep costs down for UCSD students the book author has approved the preparation of an eBook by the UCSD bookstore. The eBook is available for \$12.95 from the bookstore:

<https://www.ucsandiegobookstore.com/adoption-search-results?ccid=27525&itemid=5701>

Other options: Physical reprints are available in black and white and retail for \$25.00. This will be a print on demand option and must be pre-paid. Timeframe for reprint would be 3-5 business days, then ship out or pick up option for receiving the physical print copy. If you prefer this option over the readily available eBook you should call 858-534-4557 or email custom@ad.ucsd.edu to purchase a printed copy of the book.

2) **Journal articles and reviews will also be assigned.** The required readings for each lecture are listed in the 'Course Schedule'. Journal articles will be available as pdf files on the course Canvas website. Lecture content should be used to determine what course material is most important for exam assessment. Discussion sections will aid in helping students focus on the most important topics in the assigned reading and primary literature. The course will follow the textbook closely during the first half of the quarter; whereas journal articles will serve as the primary source material for the more recent findings discussed in the second half of the quarter (see the 'Class Schedule' document on Canvas for details). The textbook will still discuss later topics and place them into context within the learning and memory field, however, lectures and assigned articles will exceed the textbook in detail and the discussion of primary research results. Three assigned journal articles of particular significance to course content will serve as sources for graded writing prompts. More detail can be found below on this topic.

Access to Canvas

Course Website: There is a Canvas site for the course. To access this course, visit

<https://canvas.ucsd.edu/courses>. You can also use <http://coursefinder.ucsd.edu>, which will take you to all of your courses on Canvas. If you need any technical assistance with Canvas please send an email to servicedesk@ucsd.edu. Student accounts are added on the first day of class. Instruction on how to access your account for logging on to UCSD's Canvas sites can be found here: <http://acms.ucsd.edu/students/accounts-and-passwords/index.html>. Concurrent enrollment (extension) students are not added automatically. More information for extension students can be found here: <https://extension.ucsd.edu/student-resources/>

Please check the Canvas site often. Announcements, lecture slides, Zoom links, reading material, class discussion forums, after lecture problem sets (LCQs), and grades will all be communicated using the course Canvas website.

Computer or tablet and internet connection

A computer or tablet and a stable internet connection will be needed to upload assignments for this course. If you don't have a computer/tablet at home and are concerned about affording one, email vcsa@ucsd.edu to ask if they can help, or use devices available on campus. Exams will be administered in class using Scantrons or paper provided.

HOW THIS COURSE WILL BE ORGANIZED THIS QUARTER

Reading

Reading assignments are provided for each lecture (see class schedule). Lecture content should be used to determine what course material is most important and what to focus on in your reading. Journal articles that are 'Review' articles can be very dense and include information beyond the course content. For this type of reading material focus your attention to the content that aligns with topics presented in lecture.

Lectures

Lectures will be held in person as scheduled by the registrar. Any current UCSD guidelines will be followed in the classroom. Lectures will be podcast and made available for your study (<https://podcast.ucsd.edu/>). Attendance is not mandatory during the regular lecture time, but recommended as course engagement and discussion is critical for better understanding complex data. Please utilize this best practice learning opportunity and ask questions during lecture. **If you do not attend a lecture in person, you will need to watch the lecture and complete the associated LCQ questions by the start of the next scheduled class period. LCQs (see below) based on a given lecture are due before the next scheduled lecture regardless of attendance.**

Lecture Content Questions (LCQ)

Each lecture is associated with post lecture questions ('Lecture Content Questions'; LCQs). These questions will help you prepare for exams, and should be considered practice exam questions. These will be completed in Canvas, and graded upon completion (1 point each). You will be allowed multiple attempts to achieve the correct answer. A lecture LCQ becomes active after the associated lecture and is due (closes) at 9:30am the following scheduled lecture day. There will be a total of 36 LCQs (2 per lecture). **You will need to complete 28 LCQs to receive full credit.** This means there will be no makeup of LCQs past the due date, as you have passes that will cover any unexpected issues such as illness, technical problems, or excused absences. LCQs are in place of in class participation points or pop quizzes, and provide course flexibility.

LCQ questions will help you gauge how well you understand key concepts and will prepare you for exams if you use them with this purpose in mind. Of course you could keep attempting the question until the answer is right to get your 1 point, but this will not aid in your learning. **To maximize the benefit from these questions do the following:** pay attention to whether you can answer the question right away to determine if you understood that concept well. If not, go back to your notes and relearn the concept. After studying the material, try the question again. You should now be successful. If not, you may be missing something fundamental and should seek out help using the many resources available to ask questions in this class (Discussion section, office hours, discussion board). The ultimate goal is to gain a mastery of lecture content. This course will build on itself, with later concepts requiring a mastery and integration of previously learned information. Don't get behind.

Discussion Section: **Sections will NOT meet during the first week of the quarter; they will start the week of September 26th.** The date, time, and location of each section is listed in the Fall Quarter Schedule of Classes. Discussion sections will be offered in person only. Attendance at section is optional, but when assessed in previous years, the majority of students who attended BIPN148 section greater than 70% of the time received a B+ or higher in the course. The sections are designed to provide a forum for you to ask questions about the course material, and receive additional instruction. The following will ONLY be covered in section: review of basic

neurobiology concepts, instruction for reading primary research literature, discussion of LCQ questions and answers, review of correct answers for course exams, instruction of writing prompt rubric, feedback on first writing prompt draft, exam review.

Writing Prompts (You are now a popular science writer)

A primary goal of this course is to better understand how to read and interpret primary research literature. We will use as source information many prominent and important original research papers in the field of learning and memory. Three of these seminal papers have been selected as potential topics for your writing prompts (see * blue references in your Course Schedule). More detailed instruction on this topic will be available on Canvas, as a topic in Lecture 8, and discussed in Discussion section during week 5. In short, you will be expected to select 2 of the 3 selected references to serve as sources for your 2 writing prompts (20 points each, 40 points total). Each writing prompt has a unique deadline. This provides you with flexibility to best manage your schedule demands. Writing prompts will be turned in using Canvas (turnitin) and the due date for each paper is ~ two weeks after we discussed the paper in lecture (indicated by the posted Canvas assignment). **Your writing prompts need to be turned in by 11:59 pm on the assigned day. You can ignore the assignment due date on Canvas for the writing prompt paper you did not select. Please do not submit a 3rd writing prompt to grade. We will only grade 2 per person.**

Assignment. You are asked to write a one page (400-700 word) popular science article intended to inform the general audience of the significant advances and research published in the research articles selected. You will need to understand and interpret the research article so that you can clearly communicate its contents and impact to a nonscientific audience. To do this well you will need to have a solid understanding of the key findings of each paper. This is an important skill and one that scientists should do more often. You will be provided with the grading rubric beforehand (see Canvas) so that you are aware of how and what will be graded in your written piece.

You will need to be careful to not borrow language or material from the authors of the paper, other sources on the Internet, as well as past classes. Plagiarism will be assessed and monitored using Turnitin on Canvas. Be creative and speak from your own voice when writing your prompts. When you turn your writing prompt in on Canvas you will be able to see the plagiarism score created by Turnitin. Only papers with a Blue or Green plagiarism score will be graded (< 20%). papers with a yellow, orange, or red plagiarism score (> 20%) will not be graded and will receive a 0 (This score already considers the repetition of author names and institutions, as well as common agents and methods).

Writing Prompt List: Select 2 from the list of 3 to complete and turn in on or before the corresponding deadline (subject to change, please see course schedule and canvas to confirm).

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|---|---|
| 1) Whitlock et al., (2006) <i>Science</i> | Due Thursday, November 3 rd |
| 2) Nabavi et al., (2014) <i>Nature</i> | Due Thursday, November 17 th |
| 3) Bakker et al., (2008) <i>Science</i> | Due Tuesday, November 29 th |

Exams

Three in class exams will be given throughout the quarter on the dates indicated in the course schedule (also listed below). Each exam covers the material from the previous lectures. Each midterm exam will be worth 50 points each and will consist of short answer, multiple choice and true/false questions. Scantrons will be provided. Bring a number 2 pencil for testing. The final will be worth approximately 100 points and will be composed in the same format as the midterm exams.

Exam Schedule:

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|--------|------------------------------------|---------------|
| Exam 1 | Tuesday, October 18 th | Lectures 1-7 |
| Exam 2 | Tuesday, November 15 th | Lectures 8-14 |

Final Exam Thursday December 8th Lectures 15-18 and old material (cumulative)

MAKE-UP EXAMS: You are expected to take the exams when they are scheduled. To be fair to your fellow students, make-up exams can be arranged only in the following circumstances:

A) You are too ill to take the exam. In order to be excused from an exam or to take a make-up exam (The instructor decides which is most appropriate for you), you must e-mail Dr. Leutgeb and let her know that you are ill as soon as it is possible to do so (before the exam, if it is at all possible). If you do not bring written verification by a physician that you were too ill to take the exam when it was scheduled, it is at the instructor's discretion to accept or to not accept your excuse.

B) You have an extremely pressing need to be out of town at the time when the exam is scheduled (not the day before or the day after) AND you have arranged the make-up exam at least one week in advance. You cannot arrange a make-up exam after the fact. It will help in making these arrangements if you bring written confirmation of your need to miss the regularly scheduled exam when you ask to schedule a make-up exam. In any case, you will also need to bring the corroborating documents to the make-up exam. There are no make-up exams for the final because the date and time was published by the registrar prior to class registration. The instructor can also decide to excuse an exam rather than to offer a make-up exam.

Your last chance to schedule a make-up exam for the circumstances that are listed in B is by making arrangements with Dr. Leutgeb one week before the day of the exam. If you fail to talk with the instructor before or at that time, you must take the exam as scheduled (unless you are too sick to do it--see part A above).

PLEASE NOTE: Having another mid-term or final scheduled on or near the day of our exam is not a reason to take a make-up exam.

Clickers

Clickers will be used if the class becomes too large for discussion and online assessment of understanding. LCQ questions will be used after the lecture for personal assessment of key lecture concepts.

Lecture slides

Lecture slices will be available on Canvas after each lecture. Use these to review and test yourself on course content. Please do NOT post lectures or class documents on public websites like Course Hero, Chegg, or others.

Canvas Discussion Board

There will be discussion boards on Canvas where you can post your questions and answer other students' questions. IAs will monitor and answer questions daily, but I also encourage you to help each other! Please be respectful and courteous.

LETTER OF RECOMMENDATION POLICY: I only write letters of recommendation for students that I have gotten to know personally by either having worked in my laboratory, served as an instructional assistant in one of my courses, served on a committee I chaired, participated in coffee with a professor, asked questions in lecture or attended office hours regularly. If a student has performed exceptionally well in the course, but does not fit into these categories, I would only be able to provide a brief letter that provides a description of this course, and your rank within the class. These types of letters do serve a purpose in some circumstances, but may not be well suited for applications to medical school or graduate school. An agreement to write such a letter would also be contingent upon my workload obligations and the time available between the request and the deadline. Please be aware of this policy while determining your involvement in the course. You may also want to consider taking a BIPN 194 seminar course to interact closely and regularly with a Neurobiology professor in a small class size with lots of discussion. Such interactions may better facilitate the type of recommendation letter you are seeking.

GRADING:

Your final grade is based upon the following: (with % of final course grade indicated)

- 1) LCQs (1 point each, 2 per lecture, 36 points possible) = 10%
- 2) Writing Prompts (20 points each, 2 expected, 40 points possible) = 30 %
- 3) Exams (Exams 2 points each, 50 points possible + Final exam, 100 points possible) = 60%

To determine your overall grade, please use the following formula:

Total course percentage = [(% of total LCQ points) x 0.10] + [(% of total writing prompt points) x 0.30] + [(% of total exam points) x 0.60]

Grading Scale: (based on total course percentage, decimal places are rounded to the nearest whole number)

- A 93% to <100%
- A- 90% to <93%
- B+ 86% to <90%
- B 83% to <86%
- B- 80% to <83%
- C+ 76% to < 80%
- C 73% to <76%
- C- 70% to <73% (everything above this line is considered passing if grading P, NP)
- D <70% to 60% (there is no D+ or D-)
- F < 60%

STUDENTS WITH SPECIAL CIRCUMSTANCES: UCSD is committed to education for all people. Services and reasonable accommodations are available to students with temporary and permanent disabilities, to students with DACA or undocumented status, to students facing mental health issues, other personal situations, and to students with other kinds of learning needs. Please feel free to let the instructor know if there are circumstances affecting your ability to participate in class. Some resources that might be of use include:

- Office for Student with Disability, <https://students.ucsd.edu/well-being/disability-services/index.html>
- UC San Diego CAPS (Counseling & Psychological Services), <https://wellness.ucsd.edu/CAPS/Pages/default.aspx>
- UC San Diego Undocumented Student Services, <https://uss.ucsd.edu/> Note: a list of campus resources can be found here: <https://students.ucsd.edu/sponsor/undoc/resources/index.html>
- Learning Strategies Center, <https://commons.ucsd.edu/academic-support/learning-strategies/index.html>

Students requesting accommodations and services due to a disability for this course need to provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD), prior to eligibility for requests. Receipt of AFAs in advance is necessary for appropriate planning for the provision of reasonable accommodations. OSD Academic Liaisons also need to receive current AFAs. For more information, contact the OSD at (858) 534.4382 (V); (858) 534-9709 (TTY); osd@ucsd.edu, or <http://osd.ucsd.edu>. **You will need to coordinate scheduling of exams with the instructor. All of these arrangements should be made within the first two weeks of the quarter.**

ACADEMIC DISHONESTY: All suspicions of academic misconduct will be reported to the Academic Integrity Office according to university policy. Academic misconduct is not just blatant cheating (e.g., copying off another student during an exam), but what you might have thought of as "minor cheating" in high school. In particular, academic misconduct includes:

- writing an email that includes fabricated statements.
- completing another student's work or having someone complete your work.

- faking a family emergency or medical condition.
- procuring, providing, or accepting any material that contains questions or answers to any examination or assignment unless student's possession of the material has been authorized by the instructor.
- employing aids in undertaking course work or in completing any exam or assignment that are not authorized by the instructor.

The Policy on Integrity of Scholarship (academicintegrity.ucsd.edu) and this syllabus list some of the standards by which you are expected to complete your academic work, but your good ethical judgment (or asking for advice) is also expected as every behavior that is unethical or not in the spirit of academic integrity cannot be listed here.

Those students found to have committed academic misconduct will face administrative sanctions imposed by their college Dean of Student Affairs and academic sanctions imposed by the instructor. The standard administrative sanctions include: the creation of a disciplinary record (which will be checked by graduate and professional schools); disciplinary probation; and attendance at an Academic Integrity Seminar (at a cost of \$75). Students can also face suspension and dismissal from the University; those sanctions are not at the instructors' discretion. Academic sanctions can range from an F on the exam (i.e., receive zero points for that exam) to an F in the class. The appropriate sanctions are determined by the egregiousness of the Policy violation. Students who assist in or are complicit with cheating could also be in violation of the Policy. Thus, students who become aware of their peers either facilitating academic misconduct or committing it should report their suspicions to an instructor for investigation.

See <http://weber.ucsd.edu/~dkjordan/resources/cheat.html> for additional information.