Neuroscience of Learning

Course description:
This advanced undergraduate course is designed to provide you with an introduction into the neural basis of learning and memory. The course will present both human and animal research. Topics covered will include: Basic mechanisms learning; learning theories; applications of learning; biological influences of learning; cognitive control of behavior and memory processes.

Time and Location:
10:20-11:40 AM on Tuesday and Thursday throughout Spring Semester 2025 in Natural Sci Bldg 205.

Office hours on Fridays 9:00-10:00 AM: https://msu.zoom.us/j/97759330531**
Meeting ID: 977 5933 0531. Passcode: officehour

Core Textbook:
Learning 7: Principles and Applications, written by Stephen B. Klien.

Additional Reading:
Learning & Memory, written by Howard Eichenbaum

Further reading will be provided (i.e., peer-reviewed research articles and reviews) throughout the semester

Top Hat:
We will be using Top Hat Pro (www.tophat.com) for class participation and discussion. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. For instructions on how to create a Top Hat account and enroll in the Top Hat Pro course, please refer to the invitation sent to your school email address or consult Top Hat's Getting Started Guide (https://bit.ly/31TGMlw).

To connect to Top Hat complete the following:

- Go to https://app.tophat.com/register/student
- Click "Search by school" and input the name of our school
- Search for our course with the following join code: **694188**

Turn it in:
This class will use a tool called TurnItIn to compare a student's work with multiple sources. The tool compares each student's work with an extensive database of prior publications and papers, providing links to possible matches and a 'similarity score'. The tool does not determine whether plagiarism has occurred or not. Instead, Dr. Johnson must make a complete assessment and judge the

originality of the student's work. All submissions to this course might be checked using this tool. Your written paper will be checked. Students should submit papers to the TurnItIn Dropbox on D2L without identifying information included in the paper (e.g. name or student number), because viewing the submission, the information will not be retained by Turnitin. Student submissions will be retained in the global TurnItIn repository.

Grading: Grades will be determined from five sources:

(i) **Module quizzes** (35%): Three Midterm Exams: These exams will cover material dealt with during lecture periods (lectures, movies, discussion, etc) or contained in the readings. They will be multiple-choice tests administered via D2L.

(ii) **Class participation** (10%): During most classes, students will receive a minimum of four questions based on the material being discussed. The overall grade for class participation will be calculated for each correct response.

(iii) **Written paper 1** (15%): Students will write a brief review on the role of dopamine in learning and memory. You are also required to submit the final draft of your paper to analysis by Turn-It-In on our D2L site under the "Assignments" tab to verify that the content is original

(iii) **Written paper 2** (15%): Students will revise their review on the role of dopamine in learning and memory, based on comments received. You are also required to submit the final draft of your paper to analysis by Turn-It-In on our D2L site under the "Assignments" tab to verify that the content is original.

(iv) **Final exam** (20%): There will be a final exam that covers material dealt throughout the semester. It will be the same format as the midterms.

(v) **Class attendance** (5%): Attendance will be monitored throughout the semester; many classes will have overlapping themes, which are designed to help with conceptualizing the topics discussed. Students who attend less than 90% (without genuine mitigating circumstances) of the classes will receive a 5% reduction in their overall grade.

Questions and Exam Preparation
If you are having difficulty with the material, have questions or other concerns, you may come to office hours or make an appointment. You are encouraged to ask questions; I am available to help you learn!

Make-up Exams
Make-up exams will **only be given in extreme cases such as**: 1) a documented serious medical or family emergency, or 2) a documented scheduled conflict,

such as a religious holiday or required participation in a university-sanctioned event. No makeup exams will be given unless you have a valid, documented excuse (e.g., a note from the dean, a note from your doctor recommending that you not attend class). If you cannot get a note or if your excuse involves something that is personal and that you want to keep private, you must get a note from the Dean. If you cannot take the exam because of a university-scheduled event (e.g., a commitment for a sports team), a religious holiday, or some other acceptable event that you could have been foreseen, you must notify the instructor at least one week before the exam. If you cannot take the exam because of a sudden illness or because of a family emergency, you must notify Dr. Johnson **by the end of the day of the exam.** Absence from an exam for any other reason will result in a grade of 0 for that exam.

There are no make-up exams without a written valid excuse AND permission from the instructor. **Permission must be obtained immediately before or after the missed exam (within 1 day)**.

Academic Honesty

Article 2.3.3 of the Academic Freedom Report states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, the Department of Psychology adheres to the policies on academic honesty as specified in General Student Regulations 1.0, *Protection of Scholarship and Grades;* the all-University Policy on *Integrity of Scholarship and Grades*; and Ordinance 17.00, Examinations. (See *Spartan Life: Student Handbook and Resource Guide* (http://www.vps.msu.edu/SpLife/index.htm) and/or the MSU Web site: http://www.msu.edu.). At MSU, General Student Regulation 1.00 states in part that “no student shall claim or submit the academic work of another as one’s own.” (For the complete regulation, see Protection of Scholarship and Grades.) You are expected to complete all course assignments, including homework, lab work, quizzes, tests and exams, without assistance from any source. You may not assist anyone or be assisted by anyone on an exam, and you may not use the text or any notes during an exam. Your written work must be your own and you are not authorized to use the www.allmsu.com web site to complete any course work in this course. Any student caught cheating, plagiarizing or otherwise violating the MSU academic integrity policy may receive the maximum punishment, including a grade of 0.0 in the course.

Generative AI

The use of generative AI tools (such as ChatGPT, DALL-E, etc.) is not permitted in this class; therefore, any use of AI tools for work in this class may be considered a violation of Michigan State University’s policy on academic integrity, the Spartan Code of Honor Academic Pledge and Student Rights and Responsibilities, since the work is not your own. The use of unauthorized AI tools may result in a grade of 0.0 in the course.

Classroom Behavior
Although classes will be taken virtually during this semester, the same expectations apply as regular class settings. This includes: Students are expected to put away all distractions before class begins, and turn off cell phones etc. It is not appropriate to answer phone calls or text message during lecture. If you arrive late or leave early, plan to sit near the back and by an aisle to minimize the disruption to others. Please respect your instructors and fellow students by turning off unnecessary electronic communication devices during class. Distracting activities such as instant messaging, writing e-mail, social networking, or playing games is **strictly prohibited during class time.** These behaviors are disruptive and are not conducive to the learning process. This includes using social-media applications or links (e.g., class group chat) to share information that contributes to a student's class grades (including attendance links, exam questions or Tophat questions).

Accommodations for Disabilities
Students with disabilities should contact the Resource Center for Persons with Disabilities (RCPD) to establish clear and reasonable accommodations. For an appointment with a counselor, call 353-9642 (voice) or 355-1293 (TTY). If you require testing accommodations as specified from RCPD, contact your TA with the appropriate paperwork at least one week prior to the exam date.

Additional information
Reading and other material: Relevant manuscripts, commentaries, opinion articles and reviews will be made available electronically (suggested material can be found below). These readings have been purposely chosen due to their relevance to the material discussed in class. During class you will also be shown carefully selected videos on topics relevant to the study of food intake and overeating.

Week beginning	Course topic(s)	Notes & activities
1/13/25	- Course introduction - Module 1: History of Learning	- Chapters 1 & 2
1/20/25	- Module 1: History of Learning - Module 3: Habituation and sensitization	- Chapters 1, 2 & 3
1/27/25	- Module 4: Basic plasticity	- Chapter 3
2/3/25	- Module 5: Classical conditioning	- Chapter 5 **- Quiz (Modules 1,2,3 & 4): 2/4/25**
2/10/25	- Module 5: Classical conditioning	- Chapter 5 - Additional reading: Chapter 11 in L&M **- No class 2/13/25**
2/17/25	- Module 6: Neurobiological basis of Classical conditioning - Module 7: Operant conditioning	- Chapter 11 - Online material presented
2/24/25	- Module 7: Operant conditioning	- Chapter 11 **- Writing project 1 deadline: 2/28/25**
3/3/25	- Spring Break	**- No classes**
3/10/25	- Module 8: Neurobiological basis of instrumental conditioning	- Chapter 11 - Chapter 12 - Online material provided
3/17/25	- Module 9: Memory consolidation, reconsolidation and amnesia - Module 10: Cognitive control of behavior	- Chapter 12
3/24/25	- Module 11: Cognitive models	- Chapter 11 - Chapter 12 - Online material provided **- Quiz (Modules 5,6,7 & 8): 3/27/25**
3/31/25	- Module 12: Learning models	- Chapter 11 - Chapter 12 - Online reading material provided **- Writing project 2 deadline: 4/4/25**
4/7/25	- Module 13: Maladaptive learning and memory processes	- Online reading material provided
4/14/25	- Module 14: The future of memory research	- Online reading material provided **- Quiz (Modules 9, 10, 11, 12, 13 & 14): 4/17/25**
4/21/25	- Review sessions	
4/28/25	- Final exam	**- Final exam on semester material: 5/2/25 @ 7:30AM**