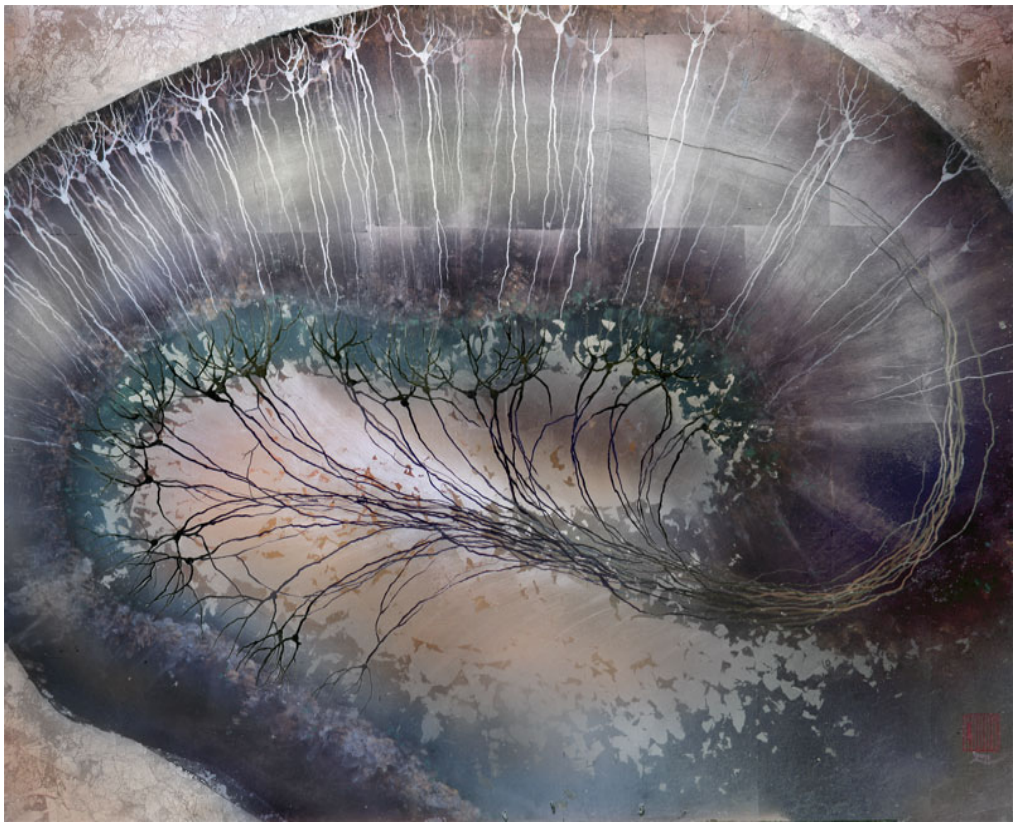


PSY 410

Memory & Amnesia

Monday|Wednesday

12:30-1:45

Moyer 008

SPRING 2017

Course Description

In this course, we will examine the neural and psychological components of memory and apply that knowledge to the solution of real world problems.

This course will provide an examination of the broad categories of memory and amnesia. Emphasis will be placed on empirical research examining the characteristics of memory and amnesia in human and animal populations. We will discuss several phenomena, including the context shift effect, state dependent retention, retrograde and anterograde amnesia, memory modulation, the malleability of memory, retrieval of "lost" memory, theories of amnesia, and "erasing" memory.

CONTACT INFORMATION

Professor	Dr. Gretchen Hanson Gotthard
Office Location	Moyer Hall 324
Phone	(484) 664-3422
Email	ggotthard@muhlenberg.edu **best way to contact me**
Want to schedule a meeting?	**Click HERE to schedule a meeting with me. If none of the available times work for you, please contact me via email and we will find a time that works.**

Course Goals

Students will work to refine their skills in:

- **Critical analysis and synthesis of empirical literature**
- **Leading discussion and presentation**
- **Collaboration with peers**
- **Formal and informal writing**

To accomplish these goals, students will work to:

- Describe and explain the major terminology, theories, and research methods used when studying memory and amnesia.
- Read, present, discuss, and reflect upon empirical memory and amnesia studies.
- Provide a critical analysis of the literature, through daily written analyses and a final oral exam that includes a synthesis of findings with concepts discussed in the literature and in class.

Requirements of the Course

EXAMS

Written Exams: The goal of written exams is to organize and synthesize the literature we are reading, not memorize citations and results.

To facilitate this goal, there will be two "open article" essay exams in this class. Exams will cover the readings and any material presented in class (including critical analyses and class discussion). Written exams will be worth 175 points total.

Oral Exam: The advantage of oral examinations is that they allow for greater elaboration and explanation from the student. Additionally, they allow the professor to explore the student's knowledge of the topic in more depth than is possible in two or three written essays on a traditional exam.

There will be one cumulative oral exam administered at the end of the semester. This exam will focus on the last section of readings, but will also include several cumulative questions that span the entire semester. Oral exams will entail a one-on-one meeting with Dr. Gotthard that will last approximately 30-45 minutes. A handout further describing oral exams is posted on Canvas and will be discussed in class. The Final Oral Exam will be worth 75 points.

LEADING DISCUSSION

Students will lead discussion on several research articles during the term. Your primary objectives when Leading Discussion include:

- Providing a **brief overview** of the article and its findings.
- Stimulating class discussion of the article by posing **several good questions** and discussion points for the class to consider.
- Being prepared to **answer questions** about your article – remember, you are the expert on that article for the day.

Keep in mind, you will not have time to cover every aspect of your article during your discussion, so try to focus on the components of the article that are most important or most interesting to you – the rest of the critical details will come out in our subsequent discussion. A handout further describing how to Lead Discussion is posted on Canvas. Leading Article Discussions will be worth **50 points total** (10 points per discussion).

CRITICAL ANALYSES

Each student will hand in a critical analysis paper for every article discussed in class. Critical Analyses should be typed and will be worth 1 point each. These analyses should include:

A brief summary of the article.

- This summary will generally be a short paragraph). It should focus on KEY points from the article (i.e., critical items that will help you

recall what was important about that particular article).

An analysis and synthesis of the article.

- This critique can be as detailed as you want, but will generally be about half a page (single-spaced).

Some points to consider when writing critical analyses include, but are not limited to:

- Discussing confounds in the study.
- Pointing out advantages and disadvantages of methods, rationales, and interpretations employed in the study.
- Discussing similarities and/or differences that exist between the current study and other papers we've read.
- Asking questions about any items that are not entirely clear.

The point of critical analyses is to allow you to delve deeper into the article and not simply accept the rationale, method, and findings at face value. One of the most important skills scientists work to refine is their ability to critically evaluate the literature in their field and work to synthesize that literature into a coherent, useful collection of information.

This writing assignment will provide numerous opportunities to hone your critical analysis/synthesis skills and help you organize and reflect upon your thoughts about the literature we are reading.

Additionally, these short critical analyses will be **very** helpful when taking exams in this class. A handout further describing Critical Analyses is posted on Canvas. Critical analyses will be worth **40 points total** (1 point each).

LEARNING OUTSIDE THE CLASSROOM (LOC)

All students taking psychology courses are required to participate in **two research studies** (LOC-R), or to complete an alternate assignment, if they do not want to participate in research. Please talk with Dr. Gotthard about the alternate assignment. Studies will be posted on the Psychology Department SONA system (online sign-up). More information about SONA will be presented in class. LOC will be worth **10 points total**. Click **here** for important information about LOC-R requirements.

READINGS

ARTICLES: All of the articles we will read are posted on Canvas. Click the icon on the right to access Canvas.

IMPORTANT: Please **have articles and critical analysis papers with you in class** (in hard copy or electronic form). We will draw heavily from the articles and analyses during our discussion, so it is important that you have copies with you.

Accommodations

If you have a documented disability, please let me know what I can do to facilitate your learning in this class. Students requiring special accommodations for this course must first contact the Office for Disability Services (Director: **Pamela Moschini, Ext. 3825**). Provide me with the appropriate documentation and I will make every effort to meet your needs.

Grading

ASSIGNMENTS	POINTS
Critical Analyses (1 point each)	40
Leading Discussion (10 points each)	50
Written Exam #1	75
Written Exam #2	100
Final Oral Exam	75
LOC (5 points each)	10
TOTAL	**350**

AN IMPORTANT NOTE ABOUT GRADING:

A grade of C is indicative of average work in this class. If you want to earn a grade in the A-range or B-range, then you need to be prepared to work hard and produce stellar work. Based on my past experiences teaching this seminar, students who earn better than average grades come to class consistently and are actively engaged, earn solid grades on their critical analyses and final exam, produce work that is well-thought-out and that involves a high level of intellectual sophistication, and consistently offer comments during class that enrich the discussion.

Grade	%	Grade	%	Grade	%	Grade	%
A	94-100	B+	87-89	C+	77-79	D+	67-69
A-	90-93	B	84-86	C	74-76	D	63-66
		B-	80-83	C-	70-73	F	0-62

The Fine Print

Be an active participant

Being an active participant in this seminar means that you will:

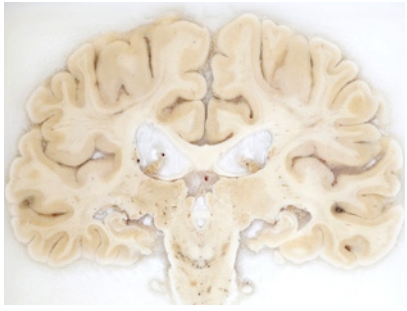
- **Come to every scheduled class and group meeting.**
- **Consistently contribute to class activities and discussions.**
- **Turn in graded and non-graded work on time.**

Active engagement in class is a key factor in learning, and therefore, your participation in this course will play an important role in grades. Failure to participate (as defined above) will result in a lower grade in this class (by as much as one letter grade). **Bottom line: Come to class prepared and be an active participant!**

Turn in assignments and take exams on time

Be sure to plan accordingly so that you can turn in all assignments on time**. Critical Analyses will not be accepted late** (please plan ahead for printing or computer problems and have copies of your analyses ready by class time). **Late exams will lose one letter grade per day**.

If you know that you will need to miss class for a legitimate reason (leaving early for break or for a vacation is NOT a legitimate excuse), please let me know early, so that we can arrange for you to turn things in before you leave.



Use your laptop for class activities only

My policy regarding electronic devices in the classroom typically involves banning them. There is ample evidence showing that **performance drops significantly when students attempt to multitask with electronic devices during class** [click **HERE** for more info].

It will be important that you have articles and critical analysis papers with you for every class. However, given the College's new policy on printing (i.e., students have a limit to their free printing), I will make an exception regarding article and critical analyses. Instead of printing every article and critical analysis paper, you **may use your laptop or tablet for classroom discussion of articles and may upload your critical analysis papers to Canvas.**

Students who use a phone or laptop during class for non-class activities will be asked to put it away; if this happens repeatedly, they will be asked to leave.

Show academic integrity in your work

All assignments in this class are pledged work under the Academic Integrity Code (click here for AIC description). I encourage you to study with other students in class and to discuss class materials with other students. However, **your tests and written assignments should be your work alone**. Students found to be breaking the AIC will receive a zero on the assignment, and depending on the circumstances, may receive a failing grade for the class. Additionally, in accordance with the AIC, please write and sign your name by the following statement on all written assignments: "I pledge that I have complied with the Academic Integrity Code in this work." If you have any questions or concerns about how the AIC applies to work in this class, I am happy to discuss this with you.

Schedule

This is an approximate guide. Material may be added or deleted throughout the semester, as time permits. If changes are made, they will be announced in class and/or via email as soon as possible.

Date	Day	Readings/Assignments	Topics
Jan 18	Wed	Introduction to the Course Practice Critical Analysis Writing: Rand & Wapner (1967)	
Jan 23	Mon	1. Godden, D. R., & Baddeley, A. D. (1975). Context-dependent memory in two natural environments: On land and underwater. *British Journal of Psychology, 66*, 325-331. **[GHG]** 2. Saufley, W.H., Otaka, S.R. & Bavaresco, J.L. (1985). Context effects: Classroom tests and context independence. *Memory & Cognition, 13*, 522-528. **[GROUP 1]**	External Context
Jan 25	Wed	3. Goodwin, D. W., Powell, B., Bremer, D., Hoine, H., & Stern, J. (1969). Alcohol and recall: State-dependent effects in man. *Science, 163*, 1358-1360. **[GROUP 2]** 4. Lisman, S. A. (1974). Alcohol "blackout": State dependent learning? *Archives of General Psychiatry, 30*, 46-53. **[GROUP 3]**	Internal Context
Jan 30	Mon	5. Eich, J. E., Weingartner, H., Stillman, R. C., & Gillin, J. C. (1975). State-dependent accessibility of retrieval cues in the retention of a categorized list. *Journal of Verbal Learning and Verbal Behavior, 14*, 408-417. **[GROUP 4]** 6. Weingartner, H., Miller, H., & Murphy, D. L. (1977). Mood state-dependent retrieval of verbal associations. *Journal of Abnormal Psychology, 86*, 276-284. **[GROUP 5]**	Internal Context
Feb 1	Wed	7. Loftus, E. F. (1975). Leading questions and the eyewitness report. *Cognitive Psychology, 7*, 560-572. **[GROUP 6]** 8. Morgan, C. A., Southwich, S., Steffian, G., Hazlett, G. A. & Loftus, E. F. (2013). Misinformation can influence memory for recently experienced, highly stressful events. *International Journal of Law and Psychiatry, 36*, 11-17. **[GROUP 7]**	Malleability of Memory

Feb 6	Mon	9. Frenda, S. J., Knowles, E. D., Saletan, W. & Loftus, E. F. (2013). False memories for fabricated political events. *Journal of Experimental Social Psychology, 49*, 280-286. **[GROUP 1]** 10. Bernstein, D. M., Pernat, N. L. M. & Loftus, E. F. (2011). The false memory diet: False memories alter food preferences. *Handbook of Behavior, Food, and Nutrition* (V. R. Preedy, R. R. Watson & C. R. Marten, Eds.), pp. 1645-1662. **[GROUP 2]**	Malleability of Memory
Feb 8	Wed	11. Gold, P.E. & Van Buskirk (1975). Facilitation of time-dependent memory processes with posttrial epinephrine injections. *Behavioral Biology, 13*, 145-153. **[GROUP 3]** 12. Segal et al. (2012). Exercise-induced noradrenergic activation enhances memory consolidation in both normal aging and patients with amnesic mild cognitive impairment. *Journal of Alzheimer's Disease, 32*, 1011-1018. **[GROUP 4]**	Modulation of Memory
Feb 13	Mon	**EXAM 1**	
Feb 15	Wed	13. Eichenbaum, H. (2017). Memory: Organization and control. *Annual Review of Psychology, 68*, 19-45. **[CLASS REVIEW]**	Neuroanatomy of Memory
Feb 20	Mon	14. Loftus, E. F., & Burns, T. E. (1982). Mental shock can produce retrograde amnesia. *Memory and Cognition, 10*, 318-323. **[GROUP 5]** 15. Schmidt, S. R. (2002). Outstanding memories: The positive and negative effects of nudes on memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 28*(2), 353-361. **[GROUP 6]**	Amnesic Agents
Feb 22	Wed	16. Bresnahan, E. E., & Routtenberg, A. (1980). Medial forebrain bundle stimulation during learning and subsequent retention disruption. *Physiological Psychology, 8*, 112-119. **[GROUP 7]** 17. Richardson, R., Riccio, D. C., & Morilak, D. (1983). Anterograde memory loss induced by hypothermia in rats. *Behavioral and Neural Biology, 37*, 76-88. **[GROUP 1]**	Amnesic Agents

Feb 27	Mon	18. Scoville, W.B. & Milner, B. (1957). Loss of recent memory after bilateral hippocampal ablation. *Journal of Neurology, Neurosurgery and Psychiatry, 20*, 11-21. **[GHG]** 19. Annese et al. (2014). Postmortem examination of patient H.M.'s brain based on histological sectioning and digital 3-D reconstruction. *Nature Communications*, 5:3122, 1-9. **[GROUP 2]**	Individuals with Amnesia
Mar 1	Wed	VIDEOS: Clive Wearing	Individuals with Amnesia
Mar 6	Mon	**SPRING BREAK: No Class**	
Mar 8	Wed	**SPRING BREAK: No Class**	
Mar 13	Mon	20. Hirano, M., Noguchi, K., Hosokawa, T., Takayama, T. (2002). I cannot remember, but I know my past events: Remembering and knowing in a patient with amnesic syndrome. *Journal of Clinical and Experimental Neuropsychology, 24*(4), 548-555. **[GROUP 3]** 21. Cowles, Beatty, Nixon, Lutz, Paulk, Paulk, & Ross (2003). Musical skill in dementia: A violinist presumed to have Alzheimer's Disease learns to play a new song. *Neurocase, 9*(6), 493-503. **[GROUP 4]**	Individuals with Amnesia
Mar 15	Wed	22. Misanin, J.R., Miller, R.R., & Lewis, D.J. (1968). Retrograde amnesia produced by electroconvulsive shock after reactivation of a consolidated memory trace. *Science, 160*, 554-555. **[GROUP 5]** 23. Nader, K., Schafe, G. E., & LeDoux, J. E. (2000). Fear memories require protein synthesis in the amygdala for reconsolidation after retrieval. *Nature, 406*, 722-726. **[GROUP 6]**	Memory (Re)Consolidation
Mar 20	Mon	24. Lynch, S., & Yarnell, P. R. (1973). Retrograde amnesia and delayed forgetting after concussion. *American Journal of Psychology, 86*, 643-645. **[GROUP 7]** 25. Land, C., Bunsey, M., & Riccio, D. C. (2000). Anomalous properties of hippocampal lesion-induced retrograde amnesia. *Psychobiology, 28*, 476-485. **[GHG]**	Retrieval Failure

Mar 22	Wed	26. Levy, R. A. (1987). A method for the recovery of mishap-related events lost to amnesia. *Aviation, Space and Environmental Medicine, 58*, 257-259. **[GROUP 1]** 27. Hanson, G. R., Bunsey, M. D., & Riccio, D. C. (2002). The effects of pretraining and reminder treatments on retrograde amnesia in rats: Comparison of lesions to the fornix or perirhinal and entorhinal cortices. *Neurobiology of Learning and Memory, 78*, 365-378. **[GROUP 2]**	Retrieval Failure
Mar 27	Mon	**EXAM 2**	
Mar 29	Wed	28. Vaiva, G., Ducrocq, F., Jezequel, K., Averland, B., Lestavel, P., Brunet, A. & Marmar, C.R. (2003). Immediate treatment with propranolol decreases posttraumatic stress disorder two months after trauma. *Biological Psychiatry, 54*, 947-949. **[GROUP 3]** 29. Brunet, A., Orr, S.P., Tremblay, J., Robertson, K., Nader, K. & Pitman, R.K. (2008). Effect of post-retrieval propranolol on psychophysiologic responding during subsequent script-driven traumatic imagery in post-traumatic stress disorder. *Journal of Psychiatric Research, 42*, 503-506. **[GROUP 4]**	Propranolol and (Re) Consolidation
Apr 3	Mon	30. Cohen, J. & Gotthard, G.H. (2011). Extinction of appetitive learning is disrupted by cycloheximide and propranolol in the sand maze in rats. *Neurobiology of Learning and Memory, 95*, 484-490. **[GROUP 5]** 31. Villain, H., et al. (2016). Effects of propranolol, a beta-noradrenergic antagonist, on memory consolidation and reconsolidation in mice. *Frontiers in Behavioral Neuroscience, 10*, 1-14. **[GROUP 6]**	Animal Models using Propranolol
Apr 5	Wed	32. Holmes, E. A., James, E. L., Coode-Bate, T. & Deeprose, C. (2009). Can playing the computer game "Tetris" reduce the build-up of flashbacks for trauma? A proposal from cognitive science. *PLoS ONE, 4*, e4153. **[GHG]** 33. James, E.L. et al. (2015). Computer game play reduces intrusive memories of experimental trauma via reconsolidation-update mechanisms. *Psychological Science*, 1-15. **[GROUP 7]**	Behavioral Applications to PTSD

Apr 10	Mon	34. Hoge, E.A. et al. (2012). Effect of acute posttrauma propranolol on PTSD outcome and physiological responses during script-driven imagery. *CNS Neuroscience & Therapeutics, 18*, 21-27. **[GROUP 1]** 35. Giustino, T.F., Fitzgerald, P.J., & Maren, S. (2016). Revisiting propranolol and PTSD: Memory erasure or extinction enhancement? *Neurobiology of Learning and Memory, 130*, 26-33. **[GROUP 2]**	
Apr 12	Wed	36. Bos, M.G.N. et al. (2014). Stress enhances reconsolidation of declarative memory. *Psychoneuroendocrinology, 46*, 102-113. **[GROUP 3]** 37. Haubrich, J. et al. (2015). Reconsolidation allows fear memory to be updated to a less aversive level through the incorporation of appetitive information. *Neuropsychopharmacology, 40*, 315-326. **[GROUP 4]**	Applications to PTSD
Apr 17	Mon	**EASTER BREAK: No Classes**	
Apr 19	Wed	38. Hernandez, P. J., & Kelley, A. E. (2004). Long-term memory for instrumental response does not undergo protein synthesis dependent reconsolidation upon retrieval. *Learning and Memory, 11*, 748-754. **[GROUP 5]** 39. Rodgriguez-Ortiz, C.J., Garcia DeLaTorre, P., Benavidez, E., Ballesteros, M. A. & Bermudez-Rattoni, F. (2008). Intrahippocampal anisomycin infusions disrupt previously consolidated spatial memory only when memory is updated. *Neurobiology of Learning and Memory, 89*, 352-359. **[GROUP 6]**	Prediction Error
Apr 24	Mon	40. Sevenster, D., Beckers, T. & Kindt, M. (2013). Prediction error governs pharmacologically induced amnesia for learned fear. *Science, 339*. 830-833. **[GHG]** 41. Sevenster, D., Beckers, T., & Kindt, M. (2014). Prediction error demarcates the transition from retrieval, to reconsolidation, to new learning. *Learning & Memory, 21*, 580-584. **[GROUP 7]**	Prediction Error
Apr 26	Wed	**MOVIE:** "Memento"	
May 1	Mon	**MOVIE:** "Memento"	
May 3	Wed	Course Wrap-Up	
		FINAL ORAL EXAM [date/time to be arranged individually]	

DISCUSSION LEADER GROUPS

GROUP 1: Joshua Lucas & Meriel Conroy

GROUP 2: Emily Strickberger & Cameron Ghassemi

GROUP 3: Corey Rozenblat & Spencer Grossinger

GROUP 4: Benjamin Levin & Zoe Homonoff

GROUP 5: Hanna Caiola

GROUP 6: Danielle Psillos & Elizabeth Vlattas

GROUP 7: Lucas Nash & Katherine Kapelsohn