

**Syllabus Learning and Thinking (Psych 320)
Spring 2019**

**Location: Morrill 2, room 222
MWF: 9:05-9:55**

INSTRUCTOR

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COURSE DESCRIPTION

Psych 320, *Learning and Thinking*, is classified as a Social & Behavioral Sciences (SB) general education course. The course will provide you with useful information to understand human and animal behavior in the real world.

The course will cover the *basic principles of learning and memory* by integrating findings from animal and human research. Given the recent developments in neuroscience over the last decade, the field of learning and memory can no longer be separated from underlying brain mechanisms. This course will therefore follow a *multidisciplinary approach* emphasizing (1) behavioral and cognitive processes; (2) brain systems involved and (3) clinical perspectives. Each topic will be divided into these three sections. For example, we will first study declarative memory from a psychological point of view (what is declarative memory in real life? How do we test declarative memory in the lab?), before learning about the brain systems that support declarative memory (the hippocampus and other areas) and the disorders associated with declarative memory deficits (amnesia).

Throughout the course, each topic will be related to real world experiences and will have direct **applications** to the understanding of human and animal behavior. For example, you will come to understand why a dog starts to whimper as soon as he smells the veterinary office (Classical Conditioning). You will learn how reward and punishment can shape behavior and understand the common mistakes that result from misusing these learning principles (Instrumental Conditioning). You will learn that memories can be easily distorted and have a dramatic impact on eyewitness testimonies (Episodic Memory). You will understand why emotional memories are special and what can be done to reduce or enhance their impact (Emotional Learning). You will learn about other animals' cognitive abilities (Observational Learning, Language Learning) and appreciate both continuity and discontinuity between the human and animal mind.

Each topic will be accompanied by a specific set of research articles (links located on Moodle). You will **think critically** about the described research by writing short reports centered on a series of fundamental questions: what was the hypothesis tested? Were the methods sound? Were the conclusions supported by the results? What were the shortcomings of the research? What would you propose in future experiments?

COURSE GOALS

This SB general education course aims at fulfilling the four basic goals listed below.

1) Content goal: The course focuses on the *fundamental principles of learning and memory, the neural substrates of learning and memory and their clinical implications*. Each topic will be divided into these three sections. The course will cover historical perspectives before describing different aspects of learning (non-associative learning, classical and instrumental conditioning, observational, emotional, language learning) and memory (declarative and non-declarative memory, working memory). Each of these topics will integrate findings from animal and human research and will be based on reading the book chapters and primary research articles, as well as analyzing videos presented in class.

2) Critical thinking goal: students taking this course will develop critical thinking by systematically investigating *the validity of the questions asked, of the methods used and of the conclusions drawn* in the research articles or video clips.

3) Communication goal: This class includes five exams. While most exam questions will be multiple choices, a number of open questions will require you to *synthesize some ideas* or to use information learned in class to *answer new problems*. We will practice such exercises in class (I>clicker). You will also get feedback on your written reports of research articles/videos to improve your ability to present well-constructed answers.

4) Connections goal: This course presents material that is highly relevant to real-life experiences and behaviors. By understanding the principles of learning and memory, their neural basis and their disorders, you will be able to *critically evaluate* the potential causes of a behavior and the consequences of a behavior. You will also be able to *apply these principles* in everyday life to optimize your own learning, as well as your parenting and animal trainer skills.

PREREQUISITES

For Psychology majors, this course is meant to be taken in the junior or senior years, after completion of Introductory Psychology (100), Statistics (240) and Methods (241) or by permission of the instructor. For non-Psychology majors, a basic background in math/algebra and science is required.

REQUIRED TEXT

Learning and Memory: From Brain to Behavior (2016), **3rd edition**. Gluck MA, Mercado E and Myers CE. Worth Publishers, New York, NY.

BOOK COMPANION SITE

<http://www.macmillanlearning.com/Catalog/studentresources/gluck3e>

Provides students with online flash cards. Students are encouraged to test their knowledge by taking the online quizzes

COURSE WEBSITE

Course-related information and material can be found on Moodle

Lectures in PowerPoint format will be posted before class. The posted lectures will contain most of the material covered in class, but will be incomplete. Students are expected to come to class to complete the missing information.

I>CLICKER2

This course requires the use of an i>Clicker2 remote. You can purchase it at the Textbook Annex. **You need to register your i>clicker 2 remote:**

- log in to Psych320 on Moodle and click the **i>clicker registration** Content Link.
- Enter the unique serial number from the back of your i>clicker2 remote and click **Register**.

READING MATERIAL

Readings are not optional! Most classes will have assigned reading material that must be completed prior to the lecture. You are responsible for downloading the articles from the links provided on Moodle.

GRADING

Grades are based on a total of 330 points that are made up of attendance (30 points) and exams (300 points). In addition, students have the opportunity to earn up to 30 extra credit points. Details are below.

- **Attendance (30 pts)**

Performance in this class is highly dependent on attending the lectures. Therefore, regular attendance is expected. Attendance will be recorded and will count towards the final grade.

- **Exams (300 pts)**

There will be a total of 6 exams. Five exams will be in-class exams and the 6th is a final exam scheduled during finals week. Your course grade will be based on your 4 highest in-class exam grades and your Final (i.e. **the Final exam cannot be dropped**). Each in-class exam will count for 50 points and the Final will be worth 100 points.

- **Make-up exams**

Students may request a makeup exam **ONLY IF** they have a legitimate reason for missing the regularly scheduled exam and can show valid documentation for that reason (e.g. doctor's note). If you do not have valid documentation, the request will be denied. If you do legitimately miss an exam, you will be allowed to make up the exam at a later date. Please contact the instructor as soon as possible if you know that you cannot attend an exam.

- **Extra credit**

You have many opportunities to earn extra credit points

1. Participating in Departmental Research (up to 6 pts + 2pts for prescreening).

SONA is open from 1/22/19 – 5/1/19. The last day to do studies this semester is 5/6/19. Students can sign up by following the instructions available at:

<http://www.umass.edu/pbs/undergraduate/sona-and-human-subjects-research>

Prescreen will be posted from 1/22/19 – 2/13/19. You will get 2 credits for completing the survey during that time. A SONA credit is worth a 1/2 of a percentage point on the final grade. 3 no-shows per semester will result in a lock out of the system.

2. Writing short reports on assigned readings, special lectures or in-class activities (1 or 2 pts each, up to 22 points).

- **Final grades will be based on the following percentage distribution:**

94-100%	A
< 94-90%	A-
< 90-87%	B+
< 87-84%	B
< 84-80%	B-
< 80-77%	C+
< 77-74%	C
< 74-70%	C-
< 70-67%	D+
< 67-64%	D
< 64-60%	D-
< 60%	F

ACADEMIC HONESTY

All students are expected to adhere scrupulously to the University policy concerning academic honesty. **All written work must be your very own! Cheating on exams, copying someone's work, or letting someone copy your work constitute violations** that will be pursued. For more information check this web site: <http://www.umass.edu/honesty/>

Date	Topic	Book readings	Readings/Online Material
Wed 1/23	Overview		
Fri 1/25	History	Chapter 1, 13-27	See online links Moodle
Mon 1/28	History	Chapter 1 27-33	See online links Moodle
Wed 1/30	Neuroscience bases	Chapter 2, 35-51	See online links Moodle
Fri 2/1	Neuroscience bases	Chapter 2, 51-69	See online links Moodle
Mon 2/4	Non Associative Learning	Chapter 3, 71-95	Schacter et al (1993)
Wed 2/6	Non Associative Learning	Chapter 3, 95-113	Harris et al (2009)
Fri 2/8	Review	Chapters 1-3	
Mon 2/11	NO CLASS	Watch How does your Memory work	Write 1 page report
Wed 2/13	Exam in class # 1	Chapters 1-3	
Fri 2/15	Classical Conditioning	Chapter 4, 115-147	Watson & Rayner (1920)
Tues 2/19	Classical Conditioning	Chapter 4, 130-165	Domjan (2005)- Garcia (
Wed 2/20	Review	Chapters 3,4	
Fri 2/22	Exam in class #2	Chapters 3,4	
Mon 2/25	Operant Conditioning	Chapter 5, 167-182	Manteuffel et al (2009)
Wed 2/27	Operant Conditioning	Chapter 5, 182-193	Volkow and Li (2004)
Fri 3/1	Operant Conditioning	Chapter 5, 193-211	Crowell-Davis (2008)
Mon 3/4	Declarative Memory	Chapter 7 267-289	Loftus (2003) + Moodle Links
Wed 3/6	Declarative Memory	Chapter 7 289-309	Schacter & Loftus (2013)
Fri 3/8	Review	Chapter 5,7	
Mon 3/18	Exam in class #3	Chapters 5,7	
Wed 3/20	Skill Memory	Chapter 8 311-331	Wolpert and Flanagan (2010)
Fri 3/22	Skill Memory	Chapter 8 331-349	Constantino & Honig (2001)
Mon 3/25	Working Memory	Chapter 9 351-371	
Wed 3/27	Working Memory	Chapter 9 371-393	Baddeley (2010)
Fri 3/29	Review	Chapters 8-9	

Mon 4/1	Exam in class #4	Chapters 8-9	
Wed 4/3	Emotional Learning	Chapter 10, 395-415	Carstensen (2006)
Fri 4/5	Emotional Learning	Chapter 10, 415-437	Feinstein (2011) Quirk & Milad (2010)
Mon 4/8	Social Learning	Chapter 11, 439-459	
Wed 4/10	Social Learning	Chapter 11, 459-471	Horner and Whiten (2005)
Fri 4/12	Review	Chapters 10-11	
Wed 4/17	Exam in class # 5	Chapters 10-11	
Fri 4/19	Development and Aging	Chapter 12, 459-471	Basak et al (2008) Mucke (2009)
Mon 4/22	Development and Aging	Chapter 12, 471-497	Steinberg (2013)
Wed 4/24	Review	Chapter 12	
Friday 4/26	Overall Review	Chapters 1-7	
Mon 4/29	Overall Review	Chapters 8-12	
Wed 5/1	Review Q & A		

Schedule is subject to change

READINGS AND ONLINE MATERIAL

- **Overview-History**
- **Neuroscience**
- **Non Associative Learning**

Schacter DL, Chiu CY, Ochsner KN. (1993). Implicit memory: a selective review. *Annu Rev Neurosci*; 16,159-82.

Harris JL, Bargh JA, and Brownell KD. (2009). Priming effects of television food advertising on eating behavior. *Health Psychology* 28(4):404-413.

- **Classical Conditioning**

Domjan (2005) Pavlovian conditioning: a functional perspective. *Ann Rev Psychol*; 56, 179 -206

Watson, JB and Rayner, R. (1920). Conditioned emotional reactions. *J Exp Psychol*; 3, 1-14.

<http://psychclassics.yorku.ca/Watson/emotion.htm>

Garcia, J., Rusiniak, K. W., & Brett, L. P. (1977). Conditioning food-illness aversions in wild animals: Caveant canonici. H. Davis, Hurowitz (eds): *Operant Pavlovian Interactions*. Lawrence Erlbaum, Hillsdale, NJ, 273-316.

- **Operant Conditioning**

Manteuffel G, Langbein J, and Puppe B.(2009). Increasing farm animal welfare by positively motivated instrumental behaviour. *Applied Anim Behav Sci*; 118, 191-198.

Volkow ND, Li TK. (2004). Drug addiction: the neurobiology of behaviour gone awry. *Nat Rev Neurosci*; 5, 963-970.

Crowell-Davis, S. L. (2008). Use of operant conditioning to facilitate examination of zoo animals. *Compend Contin Educ Vet*, 30(4), 218-9.

- **Declarative Memory**

HM's brain <http://www.nature.com/news/2009/091125/full/462403a.html>

H.M- New York Times http://www.nytimes.com/2008/12/05/us/05hm.html?_r=3&ref=science

Video Larry Squire <http://www.ucsd.tv/search-details.aspx?showID=9457>

Loftus, E.(2003) Our changeable memories: legal and practical applications. *Nat Rev Neurosci*; 4, 231-233.

Schacter, D. L., & Loftus, E. F. (2013). Memory and law: what can cognitive neuroscience contribute? *Nat Neurosci*, 16(2), 119-123.

- **Skill Memory**

Constantino AE, Honig LS. (2001). Parkinson's disease. *Sci Aging Knowledge Environ.*; 7 dn4 (Video Clip)

Wolpert DM, and Flanagan JR. (2010). Motor learning. *Curr Biol*; 20, R467-472.

- **Working Memory**

Baddeley A (2010). Working memory. *Curr Biol*; 20, R136-140.

- **Emotional Learning**

Carstensen, L. (2006) The influence of a sense of time on human development. *Science*; 30, 1913-1915.

NY Times (2009). Understanding the anxious mind

http://www.nytimes.com/2009/10/04/magazine/04anxiety-t.html?_r=2&pagewanted=1&ref=health

Quirk, G. J., Milad, M. R., (2010): Editing out fear. *Nature*. 463, 36-37.

Feinstein JS, Adolphs R, Damasio A, and Tranel D. (2011). The Human amygdala and the induction and experience of fear. *Curr Biol: CB* 21, 34-38.

- **Social Learning**

Horner, V., Whiten, A., (2005). Causal knowledge and imitation/emulation switching in chimpanzees (*Pan troglodytes*) and children (*Homo sapiens*). *Anim Cogn*; 8, 164-81.

- **Development and Aging**

Basak, C., Boot, W. R., Voss, M. W., Kramer, A. F. (2008). Can training in a real-time strategy video game attenuate cognitive decline in older adults?. *Psychol Aging*; 23, 765-777.

Mucke, L. (2009). Neuroscience: Alzheimer's disease. *Nature*. 461, 895-897.

Steinberg, L. (2013). The influence of neuroscience on US Supreme Court decisions about adolescents' criminal culpability. *Nature Rev Neurosci.*, 14, 513-518

- **Movie**

"How does your memory work", BBC, 2008

Additional material may be added on Moodle