

# SCIENCE <sup>O</sup> <sub>F</sub> FORGETTING

Class Times: W 1:30-3:50pm in Olin 303 | Office Hours: Tu 5-6pm/F 3-4pm/by appointment

## Instructor

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(preferred contact)

## Course Materials

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

## Prerequisites

This course is open to moderated students who have completed at least one of the following prerequisites: Cognitive Psychology (PSY 230), Human Memory (PSY 243), Neuroscience (PSY 231), or the instructor's permission.

## Assessment

- Moodle posts: **130pts**
- Class participation: **140pts**
- Article presentation: **130pts**
- Forgetting project: **200pts**
- Research proposal: **350pts**
- Digital poster: **50pts**

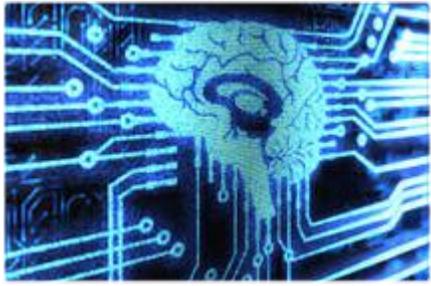


## Course Overview

Forget something? Of course, we all have. From annoying tip-of-the-tongue moments to more embarrassing (or worse) memory lapses, forgetting is a regular—and sometimes even advantageous—occurrence. But we still have a lot to learn about exactly how and why these episodes occur. In this seminar, we will consider leading psychological and neuroscientific theories of forgetting, as well as the empirical evidence for them. Do memories simply decay over time or is interference to blame? Can memories be repressed only later to be recovered? How do drugs, alcohol, and traumatic head injuries affect memory consolidation? By the end of the course, you will have acquired the scientific background necessary to address these questions in relation to forgetting in your own life, as well as notorious cases of memory failures in the public sphere.

## 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.



## Learning Objectives

Coming out of this course, you should have:

- The ability to talk competently about the cognitive processes and neural underpinnings of forgetting, as it occurs in everyday life, under the influence, in patients, and following trauma.
  - Developed an appreciation for the primary research methods and theories used to understand forgetting, as well as their limitations.
  - Come to recognize the adaptive benefits of forgetting, along with the ways in which forgetting processes can be altered overnight and across the lifespan.
  - The capacity to critically evaluate evidence related to fundamental debates pertaining to forgetting in the public sphere (e.g., whether memories can be suppressed and later recovered).
- **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 environment.
    - d) Provide adequate time to complete assignments, minimize changes to the published schedule/ assignments, and immediately notify students about any such changes.
    - e) Provide comprehensive and fair assessments of materials presented or assigned. Assignments, with a level of feedback commensurate with the nature and aims of the task, will be returned to students in a timely fashion.
    - f) Create and welcome opportunities for students to provide feedback on the course/teaching throughout the semester.
  - **You are responsible for...**
    - a) Showing up to class regularly, on time, and prepared. Please bring a printed or digital copy of your annotated readings to class meetings.
    - b) Checking your college email regularly for important messages about the course.
    - c) Keeping up with the assignments and readings. You should aim to complete the readings well in advance of class meetings, allowing yourself adequate time to wrestle with the content, coming at it from different perspectives. It may take multiple readings (and independent research online or in the library) to get a firm grasp on the material.



## Best Practices

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

- Avoid waiting until the last minute (before a due date) to attend. Seeking extra help or clarification well in advance of deadlines will leave plenty of time to act on advice.
- Email the faculty moderator 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 faculty moderator, keep in mind that:

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

Writing/other academic help is available through [Bard Learning Commons](http://www.bard.edu/dosa/handbook/index.php?aid=1201&sid=705) ([lc@bard.edu](mailto:lc@bard.edu)).

- d) Substantively participating in class discussions. It is important that you speak up if there's anything in the readings you don't understand (chances are, others have the same question). Note that a top-notch level of participation *does not necessitate responding to every question* raised in class or online; active or passive efforts to welcome contributions from everyone in the class are also looked upon favorably.
- e) Keeping distractions to a minimum in class. Phones should be turned off or set on vibrate (and kept out of sight unless explicitly required for a class activity).
- f) Submitting assignments on time, digitally via Moodle (unless prior arrangements have been made with the faculty moderator). *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 alternative testing or course accommodations (e.g., due to disability) should contact the faculty moderator 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 faculty moderator 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

- Moodle posts** (10 points per week, together accounting for 130 points) Everyone is expected to generate and post to Moodle a Twitter-style headline (140 characters max—the original character limit) encapsulating a main point from one (or more) of the assigned readings for the week. Under the headline, you are also required to post at least one thought-provoking discussion question about that reading. The headline and question must be posted by 8pm the Tuesday before the reading is to be discussed. These questions are intended to help you think deeply about the articles as well as to help organize the in-class discussion. Some weeks, students may be asked to randomly draw a discussion question out of a hat and spend some time working with the assigned material and outside resources to begin to address the question in class. Submissions will be graded on a scale from  $\sqrt{-}$  to  $\sqrt{+}$  (the high end of the scale is reserved for truly exceptional submissions). If, however, you fail to submit a post on time (even if it's only a few minutes late according to the timestamp on Moodle), it will receive a 0.

  - You are encouraged (though not required) to respond to each others' posts on Moodle before and after class. The more you engage with each other and the material, the more you'll get out of the course.
- Class participation & preparation** (roughly 10 points per week, together accounting for 140 points) are critical for enabling quality class discussions and learning throughout the semester. What's more, your thoughts, questions, and responses may simultaneously benefit your peers' understanding and the instructor's ability to identify topics that require additional attention. These are just some of the reasons why it is so important that you to regularly attend class, eager and ready to participate, having done all of the readings and assignments with due care and consideration. You should aim to contribute every class meeting. Your contributions to class discussions will be evaluated in terms of both quality and quantity (remember: all students should be given both the opportunity to contribute and respectful consideration of their questions/comments). You should plan to bring either a digital or physical printout (color, if possible) of the required readings to each class, as we will be scrutinizing figures and text. Throughout the semester, the instructor reserves the right to assign in-class exercises and short take-home assignments to facilitate your understanding of course content. Successful completion of these tasks will count towards your participation grade.
- Presenting an empirical article** (130 points) affords you an excellent opportunity to practice effectively summarizing and critiquing published experimental work. To this end, you will first be



assigned one of the designated assigned articles and then prepare a ~15-minute PowerPoint/Keynote/Google Slides presentation. This should include a brief overview of the relevant background and aims of the research, a concise description of the methods, the main findings, and the important conclusions. You should plan on explaining the main figure(s) thoroughly. Importantly, you must also provide your own critical evaluation of the research. Note that adequate preparation for your presentation may mean identifying and reading an additional article or two, so as to ensure that you have the relevant conceptual grounding. After your formal presentation, you are expected to take questions from your audience. Audience members could (and should) ask you anything from questions of clarification to deep conceptual ones. To the extent possible, you should first attempt to answer these questions from a position of authority. After that, you are welcome to open up the floor so that we can work through some of the thornier issues together.

- Presenters should upload their presentations to Moodle (in PowerPoint, Keynote, or .pdf form—convert to one of these formats if you created your presentation using GoogleSlides) by the beginning of the relevant class meeting.
- All non-presenting students will be asked to do a **5-minute free write** in which they summarize the presenter's main points, make connections to topics of interest, consider how compelling the findings/arguments are, and offer constructive criticism of the presentation. These free writes will be turned in and count towards participation, using a scale from  $\sqrt{-}$  to  $\sqrt{+}$  (the high end of the scale is reserved for truly exceptional submissions). Missing free writes will receive a 0.
- **Forgetting project (200 points)** first requires you to document your own memory failures over a two-week period of your choosing in a forgetting journal you design. You will then write a paper examining the underlying causes of forgetting that you documented. The project aims are to: (a) focus your attention on the frequency and diversity of memory lapses that you experience in everyday life, (b) emphasize the costs and benefits associated with those lapses, and (c) help relate the concepts and theories presented in this class to real life. The resulting paper should run about 6 double-spaced pages (not including your forgetting journal/any other appendices you choose to attach) that:
  - Characterize the pervasiveness and variety of forgetting that you logged over the self-observation period.
  - Clearly describe the methodology employed to catalog the aforementioned episodes and quantify their costs/benefits, while being sure to highlight the limitations of these procedures with suggested improvements. Consider the costs/benefits in terms of time, money, emotions, interpersonal relationships, etc.
  - Identify the likely genesis of a target episode (e.g., the most costly or surprising documented instance of forgetting), ideally touching on everything from (a) higher-level

situational factors and habits to (b) relevant cognitive mechanisms to (c) lower-level neurobiological influences covered in class discussions/readings.

- Situate these claims in the broader literature (from an independent literature search), considering how that type of forgetting could play out in other situations (for you personally or at the societal level).
- Follow APA style with a reference section and page numbers, use a 10- or 12-point font with reasonable margins, and are carefully checked for proper spelling and grammar.
- **Research proposal** (350 points) should aim to experimentally address (i.e., make use of random assignment and a manipulation) the explanatory power of one or more forgetting mechanism discussed in class (you are encouraged to look ahead at topics covered later in the semester). The experiment should be fully developed and free of major confounds (that are not otherwise thoroughly addressed in the discussion). The experiment may use any of the methods of cognitive neuroscience, including (but not necessarily limited to) neuroimaging, animal experimentation, or human behavioral research. You are welcome to base your design on one of those from an assigned reading; however, direct/exact replications are not appropriate for this assignment. At a minimum you would have to propose a reasonable extension and justify its theoretical value based on the full body of existing literature. The final paper should be around 10 double-spaced pages (excluding your reference list and title page) and follow APA style (see Moodle for formatting tips). Please use a 10- or 12-point font with reasonable margins. Below you'll find a suggested outline for your paper.
  - **Abstract**
  - **Introduction** (3 pages): What is your research question? What does the existing literature have to say on the subject? Summarize your hypotheses.
  - **Methods** (3 pages): What is the design of your experiment? What materials (e.g., stimuli) would you use? How are you proposing to collect and analyze the data? Be sure to justify why you are proposing these specific methods and include a statement about informed consent (should you plan to use human participants).
  - **Predicted results** (1 page): What do you expect to observe, given your hypotheses and your literature search? Include one or more figures depicting your predicted results. Incorporate commentary on potential challenges/limitations that may obscure the predicted results and how they may be overcome in future work.
  - **Discussion** (3 pages): Summarize your predicted findings with respect to your hypotheses and previous work. How do your predicted results advance the scientific field and/or benefit the wider community? Be sure to end with an overall concluding paragraph.
  - **References** (no page limit; 1-2 pages should suffice): Use APA style. Only cite articles you've read in their entirety. Otherwise, use a construction like: "Newton tried comparing apples to oranges (as cited in Hulbert, 2018)."

- **Digital poster** (50 points) will be presented on the final day of class. Each student will have 3 minutes to explain the overview of their experiment proposal (the most pertinent background information, rationale, basic design/methodology, and predicted results) using a single .pdf slide that will be projected to the class in the style of a conference presentation. Because of the strict time limit, you are expected to have rehearsed the timing of your poster spiel.
  - Students are expected to complete a critical peer review of each poster/presenter (aside from their own, of course). Additionally, everyone is encouraged to ask thoughtful questions of the presenters during the Q&A following each poster presentation.
- **Extra credit** (for up to 25 additional course points) will be offered. For credit, you are expected to read a short paper on how amnesia is represented in the movies (Baxendale, 2004), as well as a case study on a unique form of human amnesia (Smith et al., 2010)—both articles are available on Moodle (see the folder at the top of the page). With this background, you are then to choose a film or television show that prominently features a type of forgetting we discussed in class. After watching that film/TV show, you will be required to write a 4-page (double-spaced) paper (with references to peer-reviewed literature, including at least one paper not assigned for class) describing the ways in which that piece of media does/does not accurately portray forgetting processes as we currently understand them. The paper must be uploaded to Moodle (find the submission link at the top of the page) by 6pm on Friday 5/18 (the same time/date as your research proposal is due). No late extra credit submissions will be accepted. Below you will find a partial list of suitable film/TV selections:
  - ★ *Memento*
  - ★ *Eternal Sunshine of the Spotless Mind*
  - ★ *Before I Go To Sleep*
  - ★ *50 First Dates*
  - ★ *Total Recall*
  - ★ *Still Alice*
  - ★ *Sybil*
  - ★ Gilligan's Island (Season 1, Episode 30: *Forget Me Not*)
  - ★ For some additional ideas, see: <http://socrates.berkeley.edu/~kihlstrm/movies.htm>
  - ★ See also: <http://neurocritic.blogspot.com>

## Tentative Course Schedule

Date (day)	#	Topics for Class   Assignments
1/31 (w)	<b>1</b>	<b>INTRODUCTION</b> <ul style="list-style-type: none"> <li>▶ <i>Myths, Perils, &amp; Compensations</i> (Draaisma, 2015), Questions About Forgetting</li> <li>▶ Pick your poison (for presentations next week): Schacter's "Seven Sins of Memory"</li> <li>▶ Overview of structure of the course</li> <li>▶ Forgetting project, explained (with forgetting journal examples)</li> <li>▶ <a href="#">Video</a> – "Jill Price: The Woman Who Never Forgets" (7m 44s)</li> </ul>
2/7 (w)	<b>2</b>	<b>A WORLD WITHOUT FORGETTING</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Case Study: Parker, Cahill, &amp; McGaugh (2006, Neurocase)</li> <li>- Schacter (1999, American Psychologist)</li> <li>- Schacter, Guerin, &amp; St. Jacques (2011, Trends in Cognitive Sciences)</li> <li>- <i>Successful Remembering &amp; Successful Forgetting</i> (Bjork, 2011), Chapter 1</li> </ul> </li> <li>▶ Breakfast Club: Don't you (forget about me) activity</li> </ul>
2/14 (w)	<b>3</b>	<b>DÉJÀ VU ALL OVER AGAIN (RECOLLECTION VS. FAMILIARITY)</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Bahrick, Hall, &amp; Berger (1996, Psychological Science)</li> <li>- Moulin et al. (2005, Neuropsychologia)</li> <li>- <i>Controversies in Cognitive Neuroscience</i> (Slotnick, 2013), Chapter 4</li> </ul> </li> <li>▶ Debate: MTL subregions' role in recollection &amp; familiarity</li> </ul>
2/21 (w)	<b>4</b>	<b>INCIDENTAL FORGETTING: DECAY OR INTERFERENCE? A PARTIAL RESOLUTION</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- <i>Forgetting</i> (Della Sala, 2010), Chapters 1-2</li> <li>- Dewar, Cowan, &amp; Della Sala (2007, Cortex)</li> <li>- Sadeh et al. (2016, Psychological Science)</li> </ul> </li> <li>▶ Overview of signal detection theory &amp; process dissociation</li> </ul>
2/28 (w)	<b>5</b>	<b>INCIDENTAL FORGETTING: WHEN DOES RETRIEVAL INDUCE FORGETTING?</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- MacLeod &amp; Macrae (2001, Psychological Science)</li> <li>- Abel &amp; Bäuml (2015, Psychological Science)</li> <li>- Little et al. (2012, Psychological Science)</li> </ul> </li> <li>▶ Assign discussion leaders for future classes (what makes a good presentation?)</li> </ul>
3/7 (w)	<b>6</b>	<b>DON'T BE SO NEGATIVE: FROM INCIDENTAL TO MOTIVATED FORGETTING</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Charles, Mather, Carstensen (2003, Journal of Experimental Psychology: General)</li> <li>- Storm &amp; Jobe (2012, Psychological Science)</li> </ul> </li> <li>★Presenter(s): _____</li> <li>- Anderson &amp; Hanslmayr (2014, Trends in Cognitive Sciences)</li> <li>▶ <a href="#">After class: course feedback survey (online, anonymous)</a></li> </ul>

Date (day)	#	Topics for Class   Assignments
3/14 (w)	7	<b>DIRECTED FORGETTING</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Sahakyan &amp; Kelley (2002, JEP: Learning, Memory, and Cognition)</li> <li>- Manning et al. (2016, Psychonomic Bulletin and Review)</li> <li>- Dreisbach &amp; Bäuml (2014, Psychological Science)</li> </ul> </li> <li>★Presenter(s): _____</li> <li>▶ Overview of rate-your-instructor survey results</li> <li>▶ Forgetting project paper due Friday 3/16 (by 6pm via Moodle)</li> </ul>
3/21 (w)	--	NO CLASS - SPRING BREAK
3/28 (w)	8	<b>TO THINK OR NOT TO THINK: THAT IS THE PARADIGM</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Anderson &amp; Green (2001, Nature)</li> <li>- Catarino et al. (2015, Psychological Science)</li> <li>- Hulbert, Henson, &amp; Anderson (2016, Nature Communications)</li> </ul> </li> <li>★Presenter(s): _____</li> <li>▶ Experiment proposal paper, explained</li> </ul>
4/4 (w)	9	<b>FALSE MEMORY</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Defeldre (2005, Applied Cognitive Psychology)</li> <li>- Principe et al. (2006, Psychological Science)</li> <li>- Gonsalves et al. (2004, Psychological Science)</li> </ul> </li> <li>★Presenter(s): _____</li> </ul>
4/11 (w)	10	<b>RECOVERED MEMORIES</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Clancy et al., (2002, Journal of Abnormal Psychology)</li> <li>- Geraerts et al. (2009, Psychological Science)</li> <li>- Patihis et al. (2014, Psychological Science)</li> </ul> </li> <li>★Presenter(s): _____</li> </ul>
4/18 (w)	11	<b>A CURE TO FORGET</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Schiller et al. (2009, Nature)</li> <li>- Frank, O'Reilly, &amp; Curran (2006, Psychological Science)</li> <li>- Assefi &amp; Garry (2003, Psychological Science)</li> </ul> </li> <li>★Presenter(s): _____</li> </ul>
4/25 (w)	12	<b>TO DREAM THE FORGOTTEN DREAM</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Frenda et al. (2014, Psychological Science)</li> <li>- Ellenbogen et al. (2006, Current Biology)</li> <li>- Delaney et al. (2010, Psychological Science)</li> </ul> </li> <li>★Presenter(s): _____</li> </ul>

Date (day)	#	Topics for Class   Assignments
5/2 (w)	<b>13</b>	<b>ORGANIC AMNESIA</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Ryan et al. (2000, Psychological Science)</li> <li>- Higgs (2008, Psychological Science)</li> <li>- Nadel (1997, Current Opinion in Neurobiology)</li> </ul> </li> <li>★Presenter(s): _____</li> <li>• Optional reading: <ul style="list-style-type: none"> <li>- Kopelman's (2002, Brain) review of disorders of memory</li> </ul> </li> <li>▶ Preview peer-review guidance for poster session</li> <li>▶ In-class reading: Squire (2009, Neuron) on Patient H.M.'s legacy</li> </ul>
5/9 (w)	--	NO CLASS - PSYCHOLOGY BOARD DAYS
5/16 (w)	<b>14</b>	<b>INFANTILE AMNESIA &amp; AGING</b> <ul style="list-style-type: none"> <li>• Be prepared to discuss: <ul style="list-style-type: none"> <li>- Josselyn &amp; Frankland (2012, Learning &amp; Memory)</li> <li>- Akers et al. (2014, Science)</li> <li>- Anderson et al. (2011, Psychology and Aging)</li> </ul> </li> <li>★Presenter(s): _____</li> <li>• Optional reading: <ul style="list-style-type: none"> <li>- Frankland, Köhler, &amp; Josselyn (2013, Trends in Neurosciences) neurogenesis review</li> </ul> </li> <li>▶ In-class digital poster session for research proposals: 1 slide, 3 minutes</li> <li>- Be sure to turn in your peer-review forms after the poster session</li> </ul>
5/18 (f)	--	▶ Research proposal paper due today (by 6:00pm via Moodle)

*Schedule is subject to change to improve pacing and/or accommodate unforeseen events (e.g., severe weather). However, for planning purposes, every effort will be made to maintain scheduled due dates.*