

AMST 089/PSYC 089

**Methods of Detection:**

Understanding the Process of Discovery  
Through Detective Fiction and Behavioral Neuroscience  
Spring Semester 2019 MWF 1:25-2:15  
Location/Classroom TBD

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**Contacting us:** Please use the message tool on the course Sakai site.

### COURSE DESCRIPTION

In this interdisciplinary course, students learn the fundamentals of behavioral neuroscience, focusing on the ways brains perceive and construct concepts and ideas, and store information and experiences for future use. Simultaneously, they employ this knowledge to interpret and evaluate the mental exertions of fictional detectives, even as they take stock of their own behavioral habits when they engage as active readers of puzzle mysteries. Students will integrate neuroscience and detective fiction by building and beta testing an “Escape Room,” a popular entertainment whose literary derivation is the locked-room mystery and whose completion depends on individual and collaborative neuroscientific activity. These “Escape Rooms” will engage local audiences in puzzle-solving and teach non-specialists core concepts about behavioral neuroscience.

### COURSE OBJECTIVES

- This class will give students grounding in fundamental concepts related to behavioral neuroscience (i.e., the ways the brain perceives and constructs concepts and ideas, and stores experiences to be used in the future). Students will use these to evaluate the behavior of detectives and scientists as well as their own behavioral habits when they engage as active readers of puzzle mysteries and as puzzle solvers.
- This class will unpack the narrative structures associated with detection texts and scientific articles; student writing assignments will experiment with the modalities of detective fiction to communicate neuroscientists’ puzzle-solving processes to a broad audience.
- This class will require students to integrate their knowledge of behavioral neuroscience and the construction of puzzle mysteries to build an “escape room in a box” that engages audiences in the puzzle-solving process and communicates to non-specialists core concepts about behavioral neuroscience.

### TARGET AUDIENCE

This class is intended for undergraduate students interested in learning about, contrasting, and integrating the creative work of detective fiction with innovations in behavioral neuroscience. We will assume the role of literary detectives when engaging with fiction, and adopt the part of scientific detectives in the neuroscience laboratory, in order to gain a deeper understanding of how our brains confront puzzles and create solutions that ultimately lead us to an “Aha!” moment.

## REQUIRED BOOKS, MATERIALS, AND EVENTS

Required books are available at the UNC Bookstore, but feel free to purchase a different edition or used copy if it is more convenient. All other readings and sources will be made available on the Sakai website or through UNC library reserves.

→Passingham, Richard. *Cognitive Neuroscience: A Very Short Introduction*. New York: Oxford University Press, 2016.

→Sacks, Oliver. *The Man Who Mistook His Wife For a Hat*. New York: Simon and Schuster, 1998.

→McManus, Karen M. *One of Us is Lying*. New York: Delacourt Press, 2017.

→ Lab notebook (Purchase a notebook of choice; there are variety available at UNC Student Stores)

You will also be expected to visit the Bull City Escape (<https://www.bullcityescape.com/>; tickets \$25) and Cipher Escape (<http://www.cipherescape.com/>; tickets \$25) as an initial step toward the production of your own “Escape Room” later in the semester.

## COURSE RESOURCES

We will utilize a Sakai site to provide readings and other resources for the course.

## COURSE REQUIREMENTS

There will be two major assignments that you will work on this semester, as well as several smaller writing assignments. Each of these assignments is broken down into smaller pieces due throughout the semester. This ensures that you will be able to stay on track to complete your assignments, and gives us ample opportunities to provide you with feedback.

Please note the due dates for each assignment, noted on the course schedule.

- 1. Preparation and In-Class Exercises 15%:** We will use a variety of puzzles and simulations as in-class activities that facilitate active learning. These will allow us to engage more closely with the neuroscientific concepts, to test our own inductive and deductive powers, to consider the plausibility of literary and cinematic representations of detection, etc. In order to perform well on these activities, it is essential that you attend class (more than 2 unexcused absences will result in a 5% deduction from your total grade for the course) and that you have completed required readings. Additionally, you will need to contribute to small and large group discussion and remain attentive during class. READINGS ARE DUE ON THE DATE THEY ARE LISTED.
- 2. “Lab Notebook” Assignment 15%:** Purchase a notebook of choice (there are variety available at UNC Student Stores). During the first weeks of class you will receive specific instructions for entries that are tied to course materials, readings, and activities that we have or will perform in class. Later, you will also use your notebook to log and assess 4-5 games, respond to prompts, write short reviews of films and readings, etc. You will submit your lab notebook for review on January 16 and February 11, and we will periodically review the notebook over the course of the semester.
- 3. “The Neuroscientist as Detective” Assignment 30%:** This is a four-part assignment. First, you will use the software SIMPLE WRITER to demonstrate your ability to summarize and translate one of the scientific articles we provide in terms that make it accessible to the layperson. (You have the option of including illustrations or diagrams to explain the article, but this is not required.) Once your summary is approved, your second assignment is to reimagine the scientific hypothesis, experimental design, findings, and other aspects of the scholarly article as a detective story, 6-10 double-spaced pages in length. There will be time to workshop the structure of your story in class. As you work on your detective story, you will complete a third assignment: write a 1-paragraph, compressed summary of the story, designed to attract readers to your work. (A class visit to the Wilson Library to examine books in their Mystery-Detective Collection will generate a list of tips for preparing this “blurb”--and may give you design ideas for future course projects.) Finally, your fourth assignment is to create “notes for an escape room”: a 1-2 page sketch of ideas for transforming your story into an escape room. This fourth

element of the assignment should include at least 3 specific puzzles you might ask participants to perform as part of a larger immersive activity. Include the information that you would provide for them to solve each puzzle element, and how the solution to the puzzle would translate into the basic units of an escape room (a password, numeric code, etc.) You will submit all 4 assignments in a single portfolio. Due March 6.

4. **“Escape Room in a Box” 40%:** For this assignment, you will work in small groups to design and beta test an escape room. We will visit at least two escape rooms in the Triangle area to gain some experience, and will solve several ‘escape room in a box’ examples during class time. In your groups, you will identify a few core concepts in neuroscience that you will use as starting points to construct your own escape room experiences. In-class exercises will include constructing concept maps to guide your puzzle building, creating practice puzzles and presenting them to the rest of the class for feedback. We will also complete assignments on collaborative thinking and consider how multiple perspectives contribute to problem and puzzle solving. Your final product will be a complete escape room in a box that can be used by the public library or high-school curriculum, accompanied by a video (or written) debrief that unpacks the neuroscientific capacities and cognitive strengths that were activated to succeed at the escape room activity. Rubrics for each step will be posted to Sakai.

### GRADES AND GRADING SCALE

To learn more about the grading system as defined by the Office of the Registrar at UNC-Chapel Hill, see <http://registrar.unc.edu/academic-services/grades/explanation-of-grading-system/>. Keep in mind that an “A” grade represents “outstanding promise” in the discipline and “Mastery of course content at the highest level of attainment that can reasonably be expected of students at a given stage of development,” while a “C” grade indicates, “A totally acceptable performance demonstrating an adequate level of attainment for a student at a given stage of development.” At the same time, you will notice that the Graded Course Requirements reward students for their preparedness and participation in the course as well as the quality of the assignments they submit. The grading scale for this course is as follows: A (100-92.0); A- (90.0-91.9); B+ (88.0-89.9); B (82.0-87.9); B- (80.0-81.9); C+ (78.0-79.9); C (72.0-77.9); C- (70.0-71.9); D+ (68.0-69.9); D (62.0-67.9); D- (60.0-61.9); F (0-59.9)

### ACADEMIC INTEGRITY

Plagiarism and other acts of Academic Dishonesty listed in the honor code will not be tolerated. The UNC Honor Code defines plagiarism as the “deliberate or reckless representation of another’s words, thoughts, or ideas as one’s own without attribution in connection with submission of academic work, whether graded or otherwise.” It is crucial for our environment to reflect individual responsibility and mutual respect for academic goals. If you have concerns about accidentally plagiarizing the work of others or citing texts correctly, please speak to your recitation instructor or other on-campus resources. Information on proper citation procedures is available at [www.lib.unc.edu/copyright](http://www.lib.unc.edu/copyright).

Additionally, UNC’s Copyright Policy clearly prohibits students from making commercial use of notes taken in class or labs; you may not sell or otherwise acquire financial or commercial gain from notes you take in this class. Students found to have violated this prohibition are in violation of the Honor Code and are subject to Honor Court proceedings.

### ACCOMMODATIONS

This class strives to be in compliance with ADA concerns and to facilitate students with special needs. If you believe you have special needs, please address them with the instructor no later than the second week of classes so that you can be accommodated. If you have not done so already, schedule an intake interview with the Academic Success Program (ASP) at 962-7227 no later than the second week of classes. Visit <http://learningcenter.unc.edu> for more information.

## COURSE SCHEDULE

The Course Schedule and Required Readings are subject to change based on our interests, as well as predictable and unpredictable developments.

<b>Date</b>	<b>Topic</b>	<b>Readings and other activities to do before class.</b>
01-09		Introduction to the Course
01-11	Introduction: Overview and Major Issues	<p>*"Your Brain on Fiction" by Annie Murphy Paul. <i>New York Times</i> (March 17, 2012).  <a href="https://www.nytimes.com/2012/03/18/opinion/sunday/the-neuroscience-of-your-brain-on-fiction.html">https://www.nytimes.com/2012/03/18/opinion/sunday/the-neuroscience-of-your-brain-on-fiction.html</a></p> <p>*"The Adventure of the Musgrave Ritual" by Arthur Conan Doyle. <i>The Strand Magazine</i> Vol. 5(1893): 479-489.  <a href="http://etext.lib.virginia.edu:80/toc/modeng/public/DoyMusg.html">http://etext.lib.virginia.edu:80/toc/modeng/public/DoyMusg.html</a></p>
01-14	Introduction to Detective Fiction: Clues, Puzzles, and Ratiocination	<p>*"Introduction" and "Beginner's Traps" by Santiago Ramón y Cajal. <i>Advice for a Young Investigator</i>. Cambridge: MIT Press, 1999.</p> <p>*"Murders in the Rue Morgue" and excerpts from "The Purloined Letter" by Edgar Allan Poe (1850). <i>Tales of Mystery and Imagination</i>. Edited by J. M. Dent &amp; Sons, London, 1912.  <a href="http://xroads.virginia.edu/~hyper/poe/murders.html">http://xroads.virginia.edu/~hyper/poe/murders.html</a>;  <a href="http://xroads.virginia.edu/~hyper/poe/purloine.html">http://xroads.virginia.edu/~hyper/poe/purloine.html</a></p>
01-16 Ackland	Introduction to Detective Fiction: Clues, Puzzles, and Ratiocination; Key Terms and the Neuroscientific Connection	<p>*"Perceiving" and "Attending" in <i>Cognitive Neuroscience: A Very Short Introduction</i> by Richard Passingham.</p> <p>*"The Cognitive Benefits of Doodling" by Steven Heller. <i>The Atlantic</i> (2015).  <a href="https://www.theatlantic.com/entertainment/archive/2015/07/doodling-for-cognitive-benefits/398027/">https://www.theatlantic.com/entertainment/archive/2015/07/doodling-for-cognitive-benefits/398027/</a></p> <p>*(How Drawing Can Help Improve Your Memory, According to Research by Kristin Wong (2016). <i>Lifehacker</i>.  <a href="https://lifehacker.com/how-drawing-can-help-improve-your-memory-according-to-1772702367">https://lifehacker.com/how-drawing-can-help-improve-your-memory-according-to-1772702367</a></p> <p style="text-align: center;"><b>SUBMIT LAB JOURNAL FOR REVIEW</b></p>
01-18	Introduction to Key Concepts and Terminology in Neuroscience; Generating Theories and Models; and the Scientist as Detective	<p>*"A Recent Field" in <i>Cognitive Neuroscience: A Very Short Introduction</i> by Richard Passingham.</p> <p>*"10 Unsolved Mysteries Of The Brain: What we know—and don't know—about how we think." by David Eagleman. <i>Discovery Magazine</i> (July 31, 2007)  <a href="http://discovermagazine.com/2007/aug/unsolved-brain-mysteries">http://discovermagazine.com/2007/aug/unsolved-brain-mysteries</a></p> <p>*"What Can Novelists Learn from Neuroscientists" by Jonah Lehrer. <i>Science</i> (March 2012).  <a href="https://www.wired.com/2012/03/what-can-novelists-learn-from-neuroscience/">https://www.wired.com/2012/03/what-can-novelists-learn-from-neuroscience/</a></p>
01-21		No Classes

01-23	Introduction to Key Concepts and Terminology in Neuroscience; Generating Theories and Models; and the Scientist as Detective	*"Reasoning" and "Deciding" in <i>Cognitive Neuroscience: A Very Short Introduction</i> by Richard Passingham. * <i>"Sherlock Holmes: Scientific Detective"</i> by L. J. Snyder. <i>Endeavour</i> 28.3(September 2004): 104-108. <a href="https://www.ncbi.nlm.nih.gov/pubmed/15350761">https://www.ncbi.nlm.nih.gov/pubmed/15350761</a>
01-25	Introduction to Key Concepts and Terminology in Neuroscience	*"Remembering" in <i>Cognitive Neuroscience: A Very Short Introduction</i> by Richard Passingham. <b>QUIZ on Detection and Neuroscience Concepts</b>
01-28	Generating Theories and Models; and the Scientist as Detective	"Reminiscence," "Incontinent Nostalgia," "A Passage to India," in <i>The Man Who Mistook His Wife for a Hat and Other Clinical Tales</i> by Oliver Sacks

01-30	Ramon y Cajal and the Mystery of the Neuron	Field trip to "The Beautiful Brain" exhibit at the Ackland Art Museum
02-01	"Fair Play," Puzzle Mysteries and the Locked Room	<b>Field trip to NC Escape</b> , 119 Orange St, Ste 101, Durham NC 27701
02-04	"Fair Play," Puzzle Mysteries and the Locked Room	*"The Detective Novel as Game" by Roger Caillois. <i>The Poetics of Murder: Detective Fiction and Literary Theory</i> . Ed. Glenn W. Most and William W. Stowe. New York: Harcourt Brace, 1983. 1-12. * <i>"The Typology of Detective Fiction"</i> by Tzvetan Todorov. <i>The Poetics of Prose</i> . Ithaca, NY: Cornell University Press, 1977. 42-52 * <i>"Father Knox's Decalogue: The Ten Rules of (Golden Age) Detective Fiction"</i> (1928) by Ronald A. Knox. <a href="http://www.thrillingdetective.com/trivia/triv186.html">http://www.thrillingdetective.com/trivia/triv186.html</a>
02-06	"Fair Play," Puzzle Mysteries and the Locked Room; The	* <i>"Twenty Rules for Writing Detective Stories"</i> (1928) by S.S. Van Dine <a href="http://www.thrillingdetective.com/trivia/triv288.html">http://www.thrillingdetective.com/trivia/triv288.html</a> * <i>"The Guilty Vicarage: Notes on the Detective Story, by an Addict"</i> by W. H. Auden. Harpers (May 1948). <a href="http://harpers.org/archive/1948/05/0033206">http://harpers.org/archive/1948/05/0033206</a> *Guidelines for Ethical Practices in Research (pdf on Sakai)
02-08	"Fair Play," Puzzle Mysteries and the Locked Room	<b>Field trip to Bull City Escape</b> , 711 Iredell St, Durham, NC 27705
02-11	How to Build Puzzles and How to Solve Them; Finding Analytical Solutions	<b>SUBMIT LAB JOURNAL FOR REVIEW</b>
02-13	How to Build Puzzles and How to Solve Them; Finding Analytical Solutions	"The Fine Art of Baloney Detection" by Carl Sagan. <a href="http://www.inf.fu-berlin.de/lehre/pmo/eng/Sagan-Baloney.pdf">http://www.inf.fu-berlin.de/lehre/pmo/eng/Sagan-Baloney.pdf</a> * <i>"The Bloodstained Pavement,"</i> and <i>"Motive v. Opportunity"</i> by Agatha Christie. <i>The Tuesday Club Murders</i> . New York: Dodd, Mead & Company, 1973.

02-15	The Locked Room and the Laboratory: Escape Rooms and the Scientific Method	*Using the Scientific Method to Solve Mysteries: <a href="https://askabiologist.asu.edu/explore/scientific-method">https://askabiologist.asu.edu/explore/scientific-method</a>
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02-18	The Locked Room and the Laboratory: Escape Rooms and the Scientific Method	
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02-20	How to Read Scientific Articles and How (not?) to Write Them	*Smith AM, Floerke VA, Thomas AK (2016). Retrieval practice protects memory against acute stress. Science. 354(6315):1046-1048. <a href="http://science.sciencemag.org/content/354/6315/1046">http://science.sciencemag.org/content/354/6315/1046</a>
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02-22	How to Read Scientific Articles and How (not?) to Write Them	
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02-25	How to Read Scientific Articles and How (not?) to Write Them	<p style="text-align: center;"><i>Select one of the following articles.</i> <i>Bring Simpler Writer tool translation to class.</i></p> <p>1. Braun EK, Wimmer GE, Shohamy D. (2018). Retroactive and graded prioritization of memory by reward. Nature Communications 9:4886. <a href="https://www.nature.com/articles/s41467-018-07280-0">https://www.nature.com/articles/s41467-018-07280-0</a></p> <p>2. Andrillon T, Pressnitzer D, Léger D, Kouider S. (2017) Formation and suppression of acoustic memories during human sleep. Nature Communications. 8:179. <a href="https://www.nature.com/articles/s41467-017-00071-z">https://www.nature.com/articles/s41467-017-00071-z</a></p> <p>3. Allen TA, Morris AM, Stark SM, Fortin NJ, Stark CE. (2015) Memory for sequences of events impaired in typical aging. Learning and Memory. 22:138-48.</p> <p>4. Patihis L, Frenda SJ, LePort AK, Petersen N, Nichols RM, Stark CE, McGaugh JL, Loftus EF. (2013) False memories in highly superior autobiographical memory individuals. Proceedings of the National Academy of Sciences U S A. 110:20947-52. <a href="https://www.pnas.org/content/110/52/20947.long">https://www.pnas.org/content/110/52/20947.long</a></p>
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02-27	Wilson Library Field Trip: Mystery/Detective Fiction collection	
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03-01	Writing workshops I	
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03-04	Writing workshops II	
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03-06	<b>“The Neuroscientist as Detective” Assignment Due</b>	
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03-08	Reading for the Plot	* <i>One of Us is Lying</i> by Karen M. McManus
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03-11	Spring Break!	
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03-13	Spring Break!	
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03-15	Spring Break!	
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03-18	Reading for the Plot	* <i>One of Us is Lying</i> by Karen M. McManus
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03-20	Reading for the Plot	* <i>One of Us is Lying</i> by Karen M. McManus
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03-22	Reading for the Plot	* <i>One of Us is Lying</i> by Karen M. McManus
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03-25	Neuroscience as Plot Device: How does the Brain Responds to Suspense?	*Film: <i>Se7en</i> (Dir. David Fincher, 1995) *“Neural evidence that suspense narrows attentional focus.” <i>Neuroscience</i> 303(Sept 2015): 338-345. *Podcast: Hidden Brain: “Spoiler Alert!” <a href="https://www.npr.org/2018/10/29/661878959/spoiler-alert-the-psychology-of-surprise-endings">https://www.npr.org/2018/10/29/661878959/spoiler-alert-the-psychology-of-surprise-endings</a>
03-27	Neuroscience as Plot Device (Again); What are the Plots that Memory Makes?	*Baxendale, Sallie. “Memories aren’t made of this.” <i>BMJ</i> . 329(7480): 1480–1483. <a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC535990/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC535990/</a> *Selections from <i>The Man Who Mistook His Wife for a Hat and Other Clinical Tales</i> by Oliver Sacks (tbd)
03-29	Neuroscience as Plot Device (Again); Does Amnesia Fracture the Detective Plot?	*Film: <i>Memento</i> (dir. Christopher Nolan, 2001) *Selections from <i>The Man Who Mistook His Wife for a Hat and Other Clinical Tales</i> by Oliver Sacks (tbd)
04-01	Guest Speaker: Lisa Woodley, MSN, RN School of Nursing	
04-03	Neuroscience as Plot Device (Again); Does Dementia Fracture the Detective Plot?	*Film: <i>Still Alice</i> (Dir. Wash Westmoreland, Richard Glatzer, 2014) *Podcast: This American Life “It’ll Make Sense When You’re Older: Old Age” <a href="https://www.thisamericanlife.org/583/itll-make-sense-when-youre-older/act-four-0">https://www.thisamericanlife.org/583/itll-make-sense-when-youre-older/act-four-0</a> *Podcast: Radio Lab: “Vanishing Words.” <a href="https://www.wnycstudios.org/story/91960-vanishing-words">https://www.wnycstudios.org/story/91960-vanishing-words</a>
04-05	Plot Devices: Guest Speaker TBA	
04-08	Introduction to Escape Room Assignment; Objectives and Best Practices	Jung-Beeman M., Bowden E.M., Haberman J., Frymiare J.L., Arambel-Liu S., Greenblatt R., (2004). “A study using EEG and fMRI to isolate the main neural correlate of the “Aha! moment.”” <i>The Cognitive Neuroscience of Insight</i> 18(4): 210-216.
04-10	Did Too Many Concussions Make Nancy Drew a Bigot?; The Limits of Imagination and Cognitive Work in Detective Fiction	Nancy Drew book of your choice.
04-12	Escape Room Teamwork, Neuroscience Analytics and Group Workshop with Instructor Feedback	
04-15	Escape Room Group Mini Presentations and Class/Instructor Feedback (split class)	
04-17	Escape Room Beta-Testing and Recommendations for Revisions (split class)	
04-19	No classes	
04-22	Escape Room Event – Finishing Touches	
04-24	Escape Room Event – Chapel Hill Public Library and UNC- Chapel Hill Campus	
04-26	Escape Room Evaluations, Reflections and Course Evaluations	