



# Psychology 461 Cognitive Neuroscience of Memory

Fall 2015

**Class Time:** Tuesdays 2:30-4:20pm **Location:** HH150



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**Instructor:** Dr. Myra Fernandes [mafernan@uwaterloo.ca](mailto:mafernan@uwaterloo.ca)  
**Office Hours:** Fridays 1:30pm-2:20pm or by appointment **Office:** PAS 4054

## Required Course Text

*The Oxford Handbook of Memory.* Endel Tulving and Fergus I.M. Craik (Eds.). New York, NY: Oxford University Press. 2005.

## Course Description

This course considers the cognitive and neural organization of memory. We will examine why some memories are better remembered than others, the nature of true and false memories, the effects of drugs on studying, remembering, and forgetting, and the consequences of brain injury and normal aging on memory function.

The biological basis of human memory has been examined with four methods: analyses of neurological patients, investigations using neuroimaging, experiments with animals, and basic theoretical cognitive research. By reviewing and discussing classic and current research using these methods, and their findings, students will develop an understanding of how cognitive neuroscience informs current theories of memory function.

I encourage discussion between students. You will learn and retain more of the course material by asking, and answering, questions! It is important to read the assigned material as well as to attend all lectures and presentation.

## Overview of Evaluation

<b>Memory Research Presentation and Group 'podcast'</b>	<b>30%</b>
<b>Participation/Contribution to classroom discussions</b>	<b>10%</b>
<b>Take-Home Test</b>	<b>30%</b>
<b>Developing Future Research - Individual Oral Presentation</b>	<b>15%</b>
<b>Developing Future Research - Background and Justification paper</b>	<b>15%</b>

## Details on each Evaluation

### *Memory Research – Group 'podcast' – VARIOUS DUE DATES*

**Each student will prepare a 10 minute individual presentation** that reviews a topic explained in their assigned reading. During the presentation students should highlight key findings from classic studies, based on the assigned reading for that topic. **A copy of your whole group's Power Point presentation must be emailed to the Instructor by 4pm the day prior to your presentation.**

Then, as a group, students must select 1 recent study on their topic (published post 2012) and conduct a 5-minute 'podcast interview' in which 1 student acts as the interviewer, and the others as the interviewee. Interview questions and answers need to convey the following: What was the study about, How was it conducted, and Why is the study interesting to the general public.

Following your group's presentations, you will then **lead an informal Discussion session, for 15 minutes**. You should prepare 2 "Questions" on your topic for your classmates to answer. Your job during the Discussion is to guide students, bring up relevant experiments, and jump in with an opinion on the topic. You can bring in extra materials (newspaper clippings) or prepare demos related to your prepared Questions. During this time, your classmates will provide answers to your Questions, and will participate in the Discussion that you will lead.

### Participation/Contribution to classroom discussion – THROUGHOUT COURSE

During **Group presentations and 'podcast' Interviews** as well as the **Developing Future Research - Individual Oral Presentations** (except your own), you will be expected to participate in Discussions and to make Contributions based on other articles you have read, material in the assigned reading, or your opinions. For each of the presentations you can earn 1% up to a maximum of 10% for the course.

### Take-Home Test –VARIOUS DUE DATES

This test is worth 30% of your grade, and will consist of several short answer questions, and a few longer, essay-style, questions based on material covered in lectures, and in the relevant chapters in the text.

### Developing Future Research – Individual Oral Presentation – CHOOSE A DATE

Each student will prepare a short presentation (9-10 minutes in length) in which a possible future research question, on one of the topics from this course, is proposed. You will present your question, the approach to be taken, and potential implications of the study. A copy of your Power Point presentation must be **emailed to the Instructor by 4pm the day prior to your presentation**.

### Developing Future Research – Background and Justification Paper - DUE DECEMBER 1st

Prepare a 4-page written version of your 'idea for future research': You must highlight two to three previously published papers in your chosen area, and explain how these led to your proposed study (2 pages maximum). A short summary of the methods (1 page maximum) must be included. You will also need to highlight the theoretical and real-world implication of your proposed study (1 page maximum).

## **Course Web page and Course Information**

**I will post lecture notes online**, along with the course syllabus and course announcements. I will also post marks to the grade-book, and track student progress.

## Academic Integrity

**Academic Integrity:** In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility.

**Discipline:** A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to [Policy 71 - Student Discipline](#).

**Grievance:** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70 - Student Petitions and Grievances](#), Section 4.

**Appeals:** A student may appeal the finding and/or penalty in a decision made under Policy 70 - Student Petitions and Grievances (other than regarding a petition) or Policy 71 - Student Discipline if a ground for an appeal can be established. Read [Policy 72 - Student Appeals](#).

**Other sources of information for students:**

[Academic Integrity website \(Arts\)](#)

[Academic Integrity Office \(UWaterloo\)](#)

## Accommodation for Students with Disabilities

**Note for students with disabilities:** The [AccessAbility Services](#) office, located on the first floor of the Needles Hall extension, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AS office at the beginning of each academic term.

## Concerns About the Course or Instructor (Informal Stage)

We in the Psychology Department take great pride in the high quality of our program and our instructors. Though infrequent, we know that students occasionally find themselves in situations of conflict with their instructors over course policies or grade assessments. If such a conflict arises, the Associate Chair for Undergraduate Studies (Richard Eibach from July 1, 2015 through June 30, 2016) is available for consultation and to mediate a resolution between the student and instructor. Contact information is as follows:

Richard Eibach Email: [reibach@uwaterloo.ca](mailto:reibach@uwaterloo.ca); Ph 519-888-4567 ext 38790

A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. See Policy 70 and 71 below for further details.

If you feel that you have a medical or personal problem that is interfering with your work, you should contact your instructor and the Academic Counselling Office as soon as possible. Problems may then be documented and possible arrangements to assist you can be discussed at the time of occurrence rather than on a retroactive basis.

**If you fail to hand in a test on time, miss your scheduled presentation during the term, or miss one of your class-mates presentations see Policies below.**

**Students requesting accommodation for course requirements (assignments, midterm tests, final exams, etc.) due to illness** should do the following:

- seek medical treatment as soon as possible and obtain a completed uWaterloo Verification of Illness Form: <https://uwaterloo.ca/health-services/student-medical-clinic/services/verification-illness>
- submit that form to the instructor within 48 hours.
- inform the instructor by the due date for the course requirement that you will be unable to meet the deadline and that documentation will be forthcoming.

In the case of a missed assignment deadline or midterm test, the instructor will either:

1. waive the course component and re-weight remaining term work as he/she deems fit according to circumstances and the goals of the course, or
2. provide an extension.

**In the case of bereavement**, the instructor will provide similar accommodations to those for illness. Appropriate documentation to support the request will be required.

Students who are experiencing extenuating circumstances should also inform their academic advisors regarding their personal difficulties.

**PSYCH 461 Policy for late Test or Paper for non-illness or bereavement reasons**

**It is the student's responsibility to hand in a late test or paper directly to me, in person, or via email. These will be subject to a late penalty of -5% of the assigned grade, per day, including weekends.**

### **Official version of the course outline**

If there is a discrepancy between the hard copy outline (i.e., if students were provided with a hard copy at the first class) and the outline posted on LEARN, the outline on LEARN will be deemed the official version. Outlines on LEARN may change as instructors develop a course, but they become final as of the first class meeting for the term.

### ***About Your Instructor***

In my research I aim to understand the processes involved in higher cognitive functions such as memory, attention and language. I use a combination of behavioural tests and neuro-imaging to identify the brain basis of these functions. In addition I study how the normal aging process affects cognition, particularly one's ability to carry out memory tasks concurrently with other tasks (dual-tasking). This work is used to test and refine current models of how memory encoding and retrieval operate.

**The following pages contain the Tentative Schedule for classes:**

Topic	Readings and Assignments	Date
<p>Syllabus</p> <p>History of Memory Research</p> <p>Introduction to Memory Research</p>	<p>Form Group for Presentations &amp; Podcasts</p>	<p>Sept. 15<sup>th</sup></p>
<p>Methods of studying brain function</p>	<p>Chapter 3</p> <p>In-Class demonstrations</p>	<p>Sept. 22<sup>nd</sup></p>
<p>Short-term and Working Memory</p> <p>Encoding and Retrieval in Long-Term Memory</p>	<p>Chapter 5</p> <p>Chapter 6</p>	<p>Sept, 29<sup>th</sup></p>
<p>Memory for Actions and Words</p> <p>Recollection and Familiarity</p>	<p>Chapter 9</p> <p>Article: Skinner, E., &amp; Fernandes, M.A. (2007). Neural correlates of recollection and familiarity: a Review of Neuroimaging and Patient Data. <i>Neuropsychologia</i>, 45, 2163-2179</p>	<p>Oct. 6<sup>th</sup></p>
<p>Contributions from Neuroscience</p>	<p>Article: Moscovitch et al., 2006. The cognitive neuroscience of remote episodic, semantic and spatial memory. <i>Current Opinion in Neurobiology</i>, 16 179-190.</p> <p>Article: Squire, L. R. &amp; Wixted, J. T. (2011). The cognitive neuroscience of human memory since H.M. <i>Annual Review of Neuroscience</i>, 34, 259-288</p> <p><b>*Take-Home Test handed out</b></p>	<p>Oct. 13<sup>th</sup></p>
<p><b>'Is the brain fallible?'</b> <b>Distortions of Memory</b> Podcast Group 1</p> <p><b>"Who told me that?"</b> <b>Source Monitoring</b> Podcast Group 2</p>	<p>Chapter 10</p> <p>Chapter 12</p> <p><b>*Take-Home Test due for Groups 3-9</b></p>	<p>Oct. 20<sup>th</sup></p>

Topics	Readings and Assignments	Dates
<p><b>“Is the brain ready yet?” Memory in Infancy and Early Childhood</b> Podcast Group 3</p> <p><b>“Growing old” Memory changes in healthy older adults</b> Podcast Group 4</p>	<p>Chapter 17</p> <p>Chapter 25</p> <p><b>*Take-Home Test due for Groups 1-2</b></p>	<p>Oct. 27<sup>th</sup></p>
<p><b>“I remember it like it was yesterday...” Memory for Emotional Events</b> Podcast Group 5</p> <p><b>‘Does your cat remember?’ Episodic Memory in Non- Humans</b> Podcast Group 6</p>	<p>Chapter 24</p> <p>Article: Clayton NS, Bussey TJ, Dickinson A (2003). Can animals recall the past and plan for the future? <i>Nature Reviews Neuroscience</i> 4:685-691</p>	<p>Nov. 3<sup>rd</sup></p>
<p><b>‘He said she said...’ Memory and Theory of Mind</b> Podcast Group 7(2 students)</p> <p><b>‘Can you see it?’ Brain Imaging of Memory</b> Podcast Group 8 (2 students)</p>	<p>Chapter 19</p> <p>Chapter 31</p> <p>Discussion of Careers in Neuroscience</p>	<p>Nov. 10<sup>th</sup></p>
<p><b>‘Pharmaceuticals and beyond’ Drugs and Memory</b> Podcast Group 9 (2 students)</p> <p><b>Ideas for Future Research (6 presentations)</b></p>	<p>Chapter 33</p>	<p>Nov. 17<sup>th</sup></p>
<p><b>Ideas for Future Research (10 presentations)</b></p>	<p>Discussion of Careers in Neuroscience</p>	<p>Nov. 24<sup>th</sup></p>
<p><b>Ideas for Future Research (8 presentations)</b></p>	<p>Discussion of Careers in Neuroscience</p> <p>Course Evaluations</p>	<p>Dec. 1<sup>st</sup></p>

