

## 307 Human Neuropsychology – Fall 2019

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Office Hours: By appointment. The hour after class is typically good.

\*\*\* Tuesdays and Thursdays 8:30 – 9:50 p.m. PAS 1229 \*\*\*

### Teaching Assistants

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**Course Web Page:** Lectures will be available on LEARN.

### Course Description and Aims

The focus of this course is to develop broad based knowledge concerning human behaviour from a neuropsychological perspective: primarily, this means viewing behaviour through the lens of neuro, Dementias and logical damage. Basic research and clinical examples will be used to explore the brain-behaviour relationships inherent in vision and attention, memory, executive control, and beyond.

### Assessment

#### Exams

The course will be divided into three sections with each section examined independently (i.e., exams will not be cumulative). Each section's exam will be a mixture of multiple choice, fill-in-the-blanks, diagrams and short answer questions. Together, the first two exams account for 57% of the final grade. The best result of the first two midterms will be given a higher weighting (see below for full breakdown). The final exam will be worth 20% of the final grade. Thus, the three midterms make up 77% of the final grade.

#### Written Assignment

The final 23% of your grade will come from the following written assignment.

Choose a journal article relevant to one of the topics covered in the course. PubMed is a good search engine for this kind of thing (<http://www.ncbi.nlm.nih.gov/pubmed>). Critique the article with the following components to your paper:

1. Summarize the paper's main findings (~500 words)
2. Propose an alternate hypothesis to account for those findings (~500 words)
3. Design a follow-up experiment to test your hypothesis (~1,000 words)
4. Explain how data from your experiment would advance our understanding in a broader sense (~500 words)

You should submit the journal article you chose to critique as part of your assignment. Step 1 should only include any description of methodology insofar as it pertains to explaining the main findings. Step 2 should have clear directional hypotheses that support your alternate account. Step 3 should include enough detail to make it possible to critique your proposed design – that is, I am not expecting the level of detail required by an actual study – instead, think of this as a discussion you might have with a collaborator expecting your design to be modified to suit the goals of your study. Step 4 should be clear and direct – no vague statements about saving the world and curing cancer are allowed!

The goals of this assignment are threefold:

1. Develop your critical thinking skills when reading science. Sometimes it can feel like a study represents the final say on a matter when in fact this is rarely, if ever, the case.
2. Develop creative ways to address questions of brain-behaviour relationships in humans. People often view science as rigid and formulaic, but the best science depends a great deal on creatively addressing a problem.
3. Think clearly and carefully about the relevance of blue sky research. Seeing utility in applied research is easy – it is directed fairly narrowly at addressing one specific problem. Seeing how so-called “blue sky” research is relevant to the “real world” can be more challenging but is absolutely worth doing.

I have never cared about formalities in assignments. Don't ask me how many references you need – ask yourself that. References are required when claims of fact are being made – so if you make a claim of fact, reference it. Be careful not to reference web sites as your only source – that's not science. And don't under any circumstance reference my lectures – it's not a verifiable source. Don't ask me what style I would like this to be in. The style I like most is “Comprehensible” – the APA may think they have cornered the market on the most appropriate way to write science but I beg to differ. So long as your work is clear and comprehensible I don't care how you lay it out. Beyond that, come and see me to ask anything you want!

**The due date for the written assignment is Thursday November 5<sup>th</sup>.**

#### Participation in Experiments

You can earn four percent (4%) in **bonus marks** from participation in experiments through the Research Experiences Group (see details below under **Research Experiences Group (REG) Participation in Psychology Research**). In this instance .5% can be earned by participating in one half hour experiment, so to get the full 4% you will need to complete 4 full hours of experiments (see details below). If you decide you do not want to participate in experiments you can complete an alternate assignment to be determined by Dr. Danckert (alternate assignments will each be worth 1% and typically consist of one page summaries of journal articles).

Experimental credits must all be finalised by December 4<sup>th</sup>.

#### **Alternate Exams**

Students unable to take the midterm exams on the scheduled dates for any reason will be able to take make up exams scheduled with the instructor/TAs. Note, make up exams will not necessarily be in the same format as the original exam. The format chosen will be at the discretion of the instructor and could be in essay format, oral exam or in a standard (e.g., multiple choice) format.

## Summary of Assessment for Grade

Mid term 1	22 or 35% (higher weighting for better grade compared to MT2)
Mid term 2	22 or 35% (higher weighting for better grade compared to MT1)
Mid term 3	20%
Assignment	23%

## Bonus marks

REG participation	4%
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## Exam dates are as follows:

**\*\*\* SECTION 1 EXAM – Thursday Oct 3<sup>rd</sup> \*\*\***

**\*\*\* SECTION 2 EXAM – Thursday Nov 7<sup>th</sup> \*\*\***

**\*\*\* SECTION 3 EXAM – Tuesday Dec 3<sup>rd</sup> \*\*\***

**The exams will include all the topics we have covered up to the date of the lecture prior to the exam and will not be cumulative.**

## Recommended Reading

I will not be setting a specific text book for this course. I will place multiple copies (3) of the following two text books on reserve in the library for those who want to delve deeper into each topic we cover. Exams will be based on lecture material, but it is worth noting that my lectures are derived in large part from these (and other) texts.

Banich, M. T. *Cognitive Neuroscience and Neuropsychology*, (2003) Houghton Mifflin Co. New York.

Gazzaniga, Ivry, & Mangun. *Cognitive Neuroscience: The biology of the Mind, 4<sup>th</sup> Edition*, (2014). W.W. Norton

To be clear – these two text books are on reserve as *recommended reading only* – if you read the relevant chapters you will solidify your knowledge of the material. But if you attend classes you will be exposed to all you need to be able to perform well on the exams.

## Topic Relevant Journal Articles

Instead of a text book I will set aside 15 minutes at the end of each topic to discuss a relevant journal article from the recent past. The lecture is intended to give you the base knowledge we have gained over decades or longer, whereas the journal article is intended to show you a little of the “leading edge” work. I will make the papers available for download on LEARN. There will be one exam question based on each journal article covered.

## Lecture Topics (note: I don't provide dates as these may change throughout the term)

Topic 1	History of Neuropsychology <a href="#">Article: Eling &amp; Finger (2015) <i>Cortex</i>, 71, 102–115</a>
Topic 2	Methodology (Banich Ch 3) <a href="#">Article: Sandrone et al., (2014) <i>Brain</i>, 137, 621–633</a>

- Topic 3      Neuroanatomy      (Banich Ch 1 & 2)  
No Journal Article
- Topic 4      Hemispheric Specialisation      (Banich Ch 4)  
Article: Miller et al., (2010) *Neuropsychologia*, 48, 2215–2220  
Comparative biology article: Yosef et al., (2019) *Behavioural Processes*, 158, 113–116.
- Topic 5      Duplex Model of Vision  
Article: Whitwell et al, (in press) *Psychonomic Bulletin & Review*. 1–7  
Comparative biology article: Shadlen & Newsome (2001) *Journal of Neurophysiology*, 86, 1916–1936.
- Topic 6      Object Recognition      (Banich Ch 7)  
Article: Konkle & Carramazza (2013) *The Journal of Neuroscience*, 33, 10235–10242  
Comparative biology article: Marzluff et al., (2010) *Animal Behaviour*, 79, 699–707.
- Topic 7      Spatial Perception      (Banich Ch 8)  
Article: Saj et al., (2014) *Clinical Neurophysiology*, 44, 33–40  
Comparative biology article: Séguinot et al., (1993) *Journal of Comparative Physiology*, 173, 103–113.
- Topic 8      Attention      (Banich Ch 11)  
Article: Hayden et al., (2011) *Nature Neuroscience*, 14, 933–939  
Comparative biology article: Morawetz & Spaethe (2012) *The Journal of Experimental Biology*, 215, 2515–2523.
- Topic 9      Unilateral Neglect  
Article: Saj et al., (2014) *Psychological Science*, 25, 207–214  
Comparative biology article: Gaffan & Hornak (1997) *Brain*, 120, 1647–1657.
- Topic 10      Memory      (Banich Ch 10)  
Article: Oflaz et al., (in press) *Journal of Psychiatric Research*, 1–7  
Comparative biology article: Abrahms et al., (2019) *Proceedings of the National Academy of Sciences*, 116, 5582–5587.
- Topic 11      Emotion      (Banich Ch 13)  
Article: Decety et al., (2014) *Social Neuroscience*, 9, 36–49  
Comparative biology article: Meagher & Mason (2012) *PLoS ONE*, 7, 1–10.
- Topic 12      Executive Functions      (Banich Ch 12)  
Article: Hummer et al., (2014) *Brain and Cognition*, 88, 26–34.  
Comparative biology article: Pellis et al., (2014). *American Journal of Play*, 7, 73–98.
- Topic 13      The Default Mode of the Human Brain  
Article: Raichle & Snyder (2007) *NeuroImage*, 37, 1083–1090  
Comparative biology article: Lu et al (2012) *Proceedings of the National Academy of Sciences*, 109, 3979–3984.



## On Campus

- Counselling Services: [counselling.services@uwaterloo.ca](mailto:counselling.services@uwaterloo.ca) / 519-888-4567 ext. 32655
- [MATES](#): one-to-one peer support program offered by Federation of Students (FEDS) and Counselling Services
- Health Services Emergency service: located across the creek from Student Life Centre

## Off campus, 24/7

- [Good2Talk](#): Free confidential help line for post-secondary students. Phone: 1-866-925-5454
- Grand River Hospital: Emergency care for mental health crisis. Phone: 519-749-4300 ext. 6880
- [Here 24/7](#): Mental Health and Crisis Service Team. Phone: 1-844-437-3247
- [OK2BME](#): set of support services for lesbian, gay, bisexual, transgender or questioning teens in Waterloo. Phone: 519-884-0000 extension 213

Full details can be found online on the Faculty of Arts [website](#)

Download [UWaterloo and regional mental health resources \(PDF\)](#)

Download the [WatSafe app](#) to your phone to quickly access mental health support information

## Territorial Acknowledgement

We acknowledge that we are living and working on the traditional territory of the Attawandaron (also known as Neutral), Anishinaabe and Haudenosaunee peoples. The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes ten kilometres on each side of the Grand River.

For more information about the purpose of territorial acknowledgements, please see the [CAUT Guide to Acknowledging Traditional Territory \(PDF\)](#).

## Academic freedom at the University of Waterloo

[Policy 33, Ethical Behaviour](#) states, as one of its general principles (Section 1), “The University supports academic freedom for all members of the University community. Academic freedom carries with it the duty to use that freedom in a manner consistent with the scholarly obligation to base teaching and research on an honest and ethical quest for knowledge. In the context of this policy, 'academic freedom' refers to academic activities, including teaching and scholarship, as is articulated in the principles set out in the Memorandum of Agreement between the FAUW and the University of Waterloo, 1998 (Article 6). The academic environment which fosters free debate may from time to time include the presentation or discussion of unpopular opinions or controversial material. Such material shall be dealt with as openly, respectfully and sensitively as possible.” This definition is repeated in Policies 70 and 71, and in the Memorandum of Agreement, Section 6.

## **Research Experience Marks Information and Guidelines**

Experiential learning is considered an integral part of the undergraduate program in Psychology. Research participation is one example of this, article review is another. A number of undergraduate courses have been expanded to include opportunities for Psychology students to earn grades while gaining research experience.

Since experiential learning is highly valued in the Department of Psychology, students may earn a **"bonus" grade of up to 4%** in this course through research experience. Course work will make up 100% of the final mark and a "bonus" of up to 4% may be earned and will be added to the final grade if/as needed to bring your final grade up to 100%.

The two options for earning research experience grades (participation in research and article review) are described below. Students may complete any combination of these options to earn research experience grades.

### **Option 1: Participation in Psychology Research**

Research participation is coordinated by the Research Experiences Group (REG). Psychology students may volunteer as research participants in lab and/or online (web-based) studies conducted by students and faculty in the Department of Psychology. Participation enables students to learn first-hand about psychology research and related concepts. Many students report that participation in research is both an educational and interesting experience. Please be assured that all Psychology studies have undergone prior ethics review and clearance through the Office of Research Ethics.

#### ***Educational focus of participation in research***

To maximize the educational benefits of participating in research, students will receive feedback information following their participation in each study detailing the following elements:

- Purpose or objectives of the study
- Dependent and independent variables
- Expected results
- References for at least two related research articles
- Provisions to ensure confidentiality of data
- Contact information of the researcher should the student have further questions about the study

- Contact information for the Director of the Office of Research Ethics should the student wish to learn more about the general ethical issues surrounding research with human participants, or specific questions or concerns about the study in which s/he participated.

Participation in LAB studies is worth 0.5 participation credits (grade percentage points) for each 30-minutes of participation. Participation in ONLINE studies is worth .25 credits for each 15-minutes of participation. Researchers will record student's participation and will advise the course instructor of the total credits earned by each student at the end of the term.

### ***How to participate?***

Study scheduling, participation and grade assignment is managed using the SONA online system. All students enrolled in this course have been set up with a SONA account. You must get started early in the term.

[INSTRUCTIONS/DATES/DEADLINES: How to log in to Sona and sign up for studies](#)

*\*\*\* Please do not ask the Course Instructor or REG Coordinator for information unless you have first thoroughly read the information provided on this website. \*\*\**

More information about the REG program is available at:  
[REG Participants' Homepage](#)

### **Option 2: Article Review as an alternative to participation in research**

Students are not required to participate in research, and not all students wish to do so. As an alternative, students may opt to gain research experience by writing short reviews (1½ to 2 pages) of research articles relevant to the course. The course instructor will specify a suitable source of articles for this course (i.e., scientific journals, newspapers, magazines, other printed media). *You must contact your TA to get approval for the article you have chosen before writing the review.* Each review article counts as one percentage point. To receive credit, you must follow specific guidelines. The article review must:

- **Be submitted before the [last day of lectures](#). Late submissions will NOT be accepted under ANY circumstances.**
- Be typed
- Fully identify the title, author(s), source and date of the article. A copy of the article must be attached.



- Identify the psychological concepts in the article and indicate the pages in the textbook that are applicable. Critically evaluate the application or treatment of those concepts in the article. If inappropriate or incorrect, identify the error and its implications for the validity of the article. You may find, for example, misleading headings, faulty research procedures, alternative explanations that are ignored, failures to distinguish factual findings from opinions, faulty statements of cause-effect relations, errors in reasoning, etc. Provide examples whenever possible.
- Clearly evaluate the application or treatment of those concepts in the article.
- Keep a copy of your review in the unlikely event we misplace the original.