

PSYC*4470*01, Course Outline: Fall 2023

General Information

Course Title: Advanced Topics in Cognitive Neuroscience

Course Description: Major areas of contemporary cognitive neuroscience will be covered in a seminar format. Selected topic areas may include the neural basis of learning, memory, attention, sensation, and perception. The selected topics will vary on the basis of the expertise of the instructor.

Credit Weight: 0.50

Academic Department (or campus): Department of Psychology

Semester Offering: Fall 2023

Class Schedule and Location: T/Th 1:00 PM - 2:20 PM, MCKN 231

Instructor Information

Instructor Name: Dr. Mark Fenske

Instructor Email: mfenske@uoguelph.ca

Expectations about Email Communication: I do my best to answer emails within 2 business days. I do not check or answer emails on Saturdays or Sundays. I prefer that you ask your questions during class so that everyone can benefit from the discussion. Only questions that can be answered simply (e.g., “yes” or “no”, or with a short sentence) will be answered by email. Questions requiring longer answers will result in a request for you to talk with me directly. If the matter is private, please come to office hours to discuss.

Office hours: Thursdays from 3:30 - 4:30 PM via Zoom.

Go to https://calendly.com/mark_fenske/office-hour-10-min-slot? to book a time.

GTA Information

GTA Name: Dante Cantini

GTA Email: dcantini@uoguelph.ca

GTA office location and office hours: TBA

Course Content

Specific Learning Outcomes:

Critical & Creative Thinking:

- Depth & Breadth of Understanding (Master)
- Inquiry & Analysis (Master)
- Problem Solving (Master)

Literacy:

- Information (Master)
- Methodological (Master)
- Quantitative (Master)
- Technological (Introduce)

Communication:

- Oral (Master)
- Written (Master)
- Reading (Master)
- Integrative (Reinforce)

Professional and Ethical Behaviour:

- Ethical Reasoning (Reinforce)
- Ethical Issues in Research (Reinforce)

These Learning Outcomes will be achieved through the successful completion of the following Objectives. By the end of this course you should:

- 1) understand and effectively communicate to others contemporary methods and recent advances within cognitive neuroscience.
- 2) demonstrate critical assessments of the usefulness of experimental designs and research techniques for revealing the cognitive and neural substrates of thought and behaviour.
- 3) be able to apply cognitive-neuroscience methods and techniques to design and report an ethical scientific study aimed at revealing new knowledge about the neurocognitive mechanisms of thought and behaviour.
- 4) show an ability to articulate the value of collaboration across scientific disciplines and the use of multiple converging approaches to address complex scientific questions.
- 5) expanded your oral and visual communication skills through the development and provision of a PowerPoint seminar and participation in question-and-answers segments of seminars led by others.

Course Assignments and Tests:

Assignment or Test	Due Date	Contribution to Final Mark (%)	Learning Outcomes Assessed
Midterm Exam	Oct. 5	15	1, 2, 4
Oral presentation	TBA	34	1, 2, 5
Article Questions	Before each 'talks' class	8 (best 8 of 11)	1, 2
Talk Questions & Assessments	End of each 'talks' class	8 (best 8 of 11)	1, 2, 4, 5
Research Proposal	Nov. 30	35	1, 2, 3

Additional Notes:

Midterm Exam: The Midterm exam will be designed to assess students' understanding of all material covered in the readings and in-class lectures on Methods. The format of the exam will be multiple-choice questions. Exam content will cover both lectures and any assigned readings.

Assignment – Oral presentation: Each student will be required to complete an in-class presentation that effectively summarizes a recent empirical research paper within a strict 15-minute time-limit, followed by a 5-minute question and discussion period. Possible topics will be provided in the first week of classes. This project requires you to search for and select a journal article reporting research using one or more cognitive-neuroscience techniques to address a critical research question within your assigned topic, and then develop a thorough understanding of how your chosen study fits within the context of prior research within that area. Such background knowledge will be critical for determining which details are crucial for understanding the advance in knowledge made by the studies, and how to best translate this information to make it accessible to your classmates. In addition to the oral presentation, each presenter will be responsible for leading the subsequent class discussion of the presented research. This project is designed to enhance your inquiry and analysis skills, your depth and breadth of understanding, and your conceptual, and methodological, and quantitative literacy, while developing valuable visual and oral communication skills.

Assignment – Assigned Article Short-Answer Questions: For each class involving a student presentation, each student not giving a presentation that day will be assigned one of the empirical research articles selected by the student presenter for that class. You must read each assigned article and provide brief written answers to a short series of questions about the content of the article prior to the class in which it is scheduled to be presented. The questions will be posted and answered using the Quiz function on the CourseLink page before each of these classes. To account for the possibility of missed short-answer submissions due to sickness, only the best 8 of the 11-total possible submissions will count towards your final grade. If you miss completing and submitting answers to the questions about one of the articles, this will be treated as one of the three grades to be dropped—you do NOT need to

provide documentation, nor inform the instructor. If you fail to submit article-question answers three times, each additional missed submission will be given a grade of zero and count as such toward your final grade unless appropriate documentation is provided within one week to the instructor as evidence of illness or compassionate circumstances.

Assignment – Talk Questions & Assessments: Each student will be required to watch and listen to every oral presentation (aside from their own) and provide their assessment of its effectiveness, suggestions for improvement, and at least one ‘burning question’ that came to mind during the talk. The questions and assessments will be completed on a paper-and-pencil form and submitted to the instructor at the end of each class. To account for the possibility of missed opportunities to observe presentations and submit questions-and-assessments forms due to sickness, only the best 8 of the 11-total possible forms will count towards your final grade. If you miss submitting a questions-and-assessments form, this will be treated as one of the three grades to be dropped—you do NOT need to provide documentation, nor inform the instructor. If you fail to submit a questions-and-assessments form three times, each additional missed submission will be given a grade of zero and count as such toward your final grade unless appropriate documentation is provided within one week to the instructor as evidence of illness or compassionate circumstances.

Assignment - Research Review/Proposal: Each student will be required to use artificial intelligence (AI) tools (e.g., Chat-GPT) to help as they write a brief overview of an area of cognitive-neuroscience research, identify a question of interest within the area, and propose an experiment to address the question of interest. In addition to the final proposal, each student must document how they used the AI tools (e.g., what ‘prompts’ were used) and submit these along with a written reflection about the benefits, challenges and ethical considerations when using AI tools for research purposes. This project is designed to provide you with experience in the use of AI tools, in conducting a literature search, reading and summarizing journal articles, generating hypotheses, and applying your knowledge of cognitive-neuroscience techniques, research methods and data analysis to design a study that will test your hypotheses. The proposal should adhere to APA format guidelines. The paper must not exceed 25 double-spaced pages, including title page, abstract, references, tables and figures. There is no page limit for documenting how the AI tools were used, but the reflection component of the documentation/reflection paper must not exceed 3 double-spaced pages.

Lecture Content:

The list of topics for the dates indicated below represents a tentative course schedule that is subject to change throughout the semester.

Date	Topic
Sep. 07	Introduction and Overview of Brain
Sep. 12	Methods: Electrophysiology (intracranial, EEG/ERP & MEG)
Sep. 14	Methods: Structural imaging (PET & MRI)
Sep. 19	Methods: Functional imaging (PET, fMRI, fNIRS)

Sep. 21	Methods: Stimulation (TMS & tDCS / tACS)
Sep. 26	Tutorial: How to give a good presentation.
Sep. 28	Discuss research proposal & Advanced methods
Oct. 03	Advanced methods
Oct. 05	Exam: Midterm
Oct. 10	No class - FALL BREAK
Oct. 12	Student talks 1
Oct. 17	Student talks 2
Oct. 19	Student talks 3
Oct. 24	How to write a good research proposal
Oct. 26	Student talks 4
Oct. 31	Student talks 5
Nov. 02	Student talks 6
Nov. 07	Student talks 7
Nov. 09	Student talks 8
Nov. 14	Research Project
Nov. 16	No class
Nov. 21	Student talks 9
Nov. 23	Student talks 10
Nov. 28	Student talks 11
Nov. 30	Research Project: Due

Course Resources

Required Texts:

There is no course textbook.

Zoom: <https://zoom.us/education>

Other Resources:

All readings will be announced and made accessible through CourseLink.

Course Policies

Grading Policies

Completed assignments must be submitted to the corresponding Dropbox folder on the CourseLink website before the deadline on the due date indicated above. Early submissions are welcome. Late submissions will not be accepted. **Failure to submit an assignment on time will result in a grade of zero for that assignment.**

Additional grade-related information can be found in the calendar under [Undergraduate Grading Procedures](#)

Course Policy regarding use of electronic devices and recording of lectures:

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted, they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

University Policies

Disclaimer:

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email. This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

Academic Consideration

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for

Academic Consideration:

[Academic Consideration, Appeals and Petitions](#)

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

[Academic Misconduct Policy](#)

Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact [Student Accessibility Services](#) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 54335 or email accessibility@uoguelph.ca or the [Student Accessibility Services Website](#)

Student Feedback Questionnaire

These questionnaires (formerly course evaluations) will be available to students during the last 2 weeks of the semester. Students will receive an email directly from the Student Feedback Administration system which will include a direct link to the questionnaire for this course. During this time, when a student goes to login to Courselink, a reminder will pop-up when a task is available to complete.

[Student Feedback Questionnaire](#)

Drop date

The last date to drop one-semester courses, without academic penalty, is December 2, 2022. For regulations and procedures for Dropping Courses, see the [Schedule of Dates in the Academic Calendar](#).

Instructors must provide [meaningful and constructive feedback, at minimum 20% of the final course grade, prior to the 40th class day](#). For courses which are of shorter duration, 20% of the final grade must be provided two-thirds of the way through the course.

[Current Undergraduate Calendar](#)

Additional Course Information

Plagiarism Detection Software

Course instructors are allowed to use software to help in detecting plagiarism or unauthorized copying of student assignments. Plagiarism is one of the most common types of academic misconduct on our campus. Plagiarism involves students using the work, ideas and/or the exact wording of other people or sources without giving proper credit to others for the work, ideas and/or words in their papers. Students can unintentionally commit misconduct because they do not know how to reference outside sources

properly or because they don't check their work carefully enough before handing it in. Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

In this course, your instructor will be using Turnitin.com to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to prevent plagiarism in the College of Social and Applied Human Sciences.

A major benefit of using Turnitin is that students will be able to educate and empower themselves in preventing misconduct. In this course, you may screen your own assignments through Turnitin as many times as you wish before the due date. You will be able to see and print reports that show you exactly where you have properly and improperly referenced the outside sources and materials in your assignment.