

**PSYC/NEUR 521**
**Cognitive and Clinical Neuroscience**
**Winter 2023**

<b>Instructors:</b>	Giuseppe Iaria and Ford Burles	<b>Lecture Location:</b>	HNSC 124A
<b>Phone:</b>	N/A	<b>Lecture Days:</b>	Tuesday
		<b>Lecture Time:</b>	14:00-16:45
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<b>Office Hours:</b>	Request by email		

### Course Description

The course provides an overview of the latest research investigating brain mechanisms underlying some of the cutting-edge topics in cognitive neuroscience. At the outset, students will be introduced to basic concepts of cognitive neuroscience and the range of techniques used with both healthy subjects and clinical populations. In subsequent weeks, classes will consist of detailed introductions to specific topics, student presentations and class discussion of scientific literature. The goal is for students to acquire knowledge about cognitive and clinical neuroscience through selected topics and to develop critical thinking skills when evaluating scientific literature.

### Course Learning Outcomes

The Department of Psychology is committed to student knowledge and skill development. The table below lists the key learning outcomes for this course, the program-learning outcomes they facilitate (see <https://live-arts.ucalgary.ca/psychology/about#program-learning-outcomes>), and the expected level of achievement.

Course Learning Outcomes	Assessment Methods	PLO(s)	Level(s)
Analyze fundamental differences between cognitive science and cognitive neuroscience, as well as between neuropsychology and clinical neuroscience.	Quality of student's contribution on online forum discussion	1,5	C
Understand the utility of different neuroimaging techniques to investigate cognitive functioning and behaviour.	Evaluation of on student's summary presentation and online forum contribution	1,2,5	C

Evaluate the methodological approach of selected peer-reviewed scientific articles, and critique their overall contribution to the field of cognitive and clinical neuroscience.	Quality of student's online questions, and quality of online forum discussion	2,6	C
Create scientific presentation aiming to disseminate knowledge in an engaging manner	Quality of student's online summary presentation	4,5	A
Formulate questions and raise issues in order to generate discussion among peers	Quality of student's online questions, and quality of online forum discussion	1,2,4,5	C
Design a novel experiment by formulating a specific hypothesis, and produce a written research proposal	Quality and novelty of research proposal	1-5,7	A
Predict the location of brain damage (or neural activity) by observing and measuring cognitive processes.	Quality of online forum discussion	1,2,7	C

Notes. PLOs = Program-Learning Outcomes: 1 = demonstrate knowledge of psychological sciences, 2 = think critically and solve problems, 3 = conduct research and analyze data, 4 = communicate effectively, 5 = demonstrate information literacy, 6 = understand and implement ethical principles in a diverse world, 7 = apply psychological knowledge and skills, 8 = Demonstrate multicultural competence and awareness of issues related to equity, diversity,\* and inclusion. Level of PLO achievement facilitated by this course: I = introductory, C = competency, A = advanced.

### **Acknowledgments and Respect for Diversity**

Our classrooms view diversity of identity as a strength and resource. Your experiences and different perspectives are encouraged and add to a rich learning environment that fosters critical thought through respectful discussion and inclusion. The Department of Psychology would also like to acknowledge the traditional territories of the people of the Treaty 7 region in southern Alberta. The City of Calgary is also home to Métis Nation of Alberta, Region III.

### **Course Format**

This is an in-person class held on campus.

### **Prerequisites**

PSYC 300 as well as 301 or 312 (Experimental Design & Quantitative Methods) and PSYC 375 (Brain and Behaviour), and admission to the psychology or neuroscience major.

### **Required Text**

There are no required textbooks for this course. The course material consists of selected scientific articles that will be made available to students throughout the course.

### **Assessment Methods**

**Student evaluations will be based on leading one group discussion (25% of final grade), prepared questions for online forum discussion (10% of final grade), and one term paper (40% of final grade); in addition, students' participation in the online (class and forum) discussion throughout the course will account for 25% of the final grade.** Late assignments will not be accepted without instructor approval. Importantly, at the end of the

leading discussion assignment, students will receive comprehensive feedback and a percent grade.

During the first week of class, students will be asked to select a date (and, accordingly, a topic as scheduled in the course outline) for the group discussion they will be leading. Students will perform their assignments individually or in groups depending on class size, and assigned at random if the number of dates chosen voluntarily do not cover the class' topics.

**A. Leading a Group Discussion (25% of final grade).** Leading a group discussion consists of preparing a single-spaced one-page summary of the selected article, and posting it in the dedicated D2L online discussion forum to be discussed with the rest of the class. In the summary, students will be asked to examine, in detail, a peer-reviewed journal article, which other students in the class would have read as well. The summary will be posted in the discussion forum by 5pm on the Friday preceding the official scheduled time of the class. Students missing their leading discussion assignment without instructor approval will receive a 0% grade for the assignment.

During the class, students leading the discussion will be required to present their summary of the article and lead the group discussion. Evaluation is based on creativity and success in engaging students' participation in the online class discussion, clarity, accuracy and completeness of the summary.

As a guideline, each leading discussion summary assignment should include: (1) a brief overview of the subject of the article, (2) the main question that the article aims to address, the relevance of it in the context of the topic of the week, and the authors' hypothesis, (3) a detailed description of the methods and procedure used, (4) the results of the study, (5) the authors' interpretation of the results, (6) the authors' general conclusion, (7) the student's observations about the study (including merits and/or limits of the experimental approach used), and (8) the student's suggestions for future studies given the findings provided in the article.

Students are encouraged to read additional research as needed and/or to prepare material (such as handouts or prepared questions) in order to engage the class and stimulate relevant discussion. In order to actively participate in the discussion, students attending are required to read the article presented as well as additional material related to that topic in advance of the class.

**B. Prepared Questions (10% of final grade).** Students who will NOT be leading a discussion on a date/class are required to read one of the articles that will be discussed on that date/class, and post a related discussion question on the D2L forum. This question should be posted at least 24 hours before the class begins. Evaluation is based on the quality of the questions submitted throughout the course. Students not posting on the D2L online discussion forum without instructor approval will receive a 0% grade for that specific week.

**C. Term paper (40% of final grade).** Each student will write a term paper consisting of a research proposal. The proposal must focus on a topic covered during the course. The topic chosen for the proposal could be the same as that chosen (or assigned) by the student for his/her leading discussion assignments. In the proposal, students are required to formulate one

or two experiments that would make an original contribution to the literature/topic that the proposal focuses on. Importantly, the research proposal must fall under the domain of cognitive neuroscience, i.e. include humans as subjects and use cognitive neuroscience methods. Term papers will be submitted by email ([521@neurolab.ca](mailto:521@neurolab.ca)) to the instructor in .pdf format.

The content of the paper must be organized into the following sub-headings: (1) Title of the proposal and name of the student, (2) Abstract (150 words maximum), (3) Topic/literature overview, (4) Objective of the proposal, (5) Methods, (6) Expected results, (7) Implications and conclusions, (8) References (minimum 10; reference list in any format). Title of the proposal, name of the student, and abstract will form the “Title page” of the proposal. The body of the paper (excluding title page, abstract, and reference list) must not exceed five pages (double-spaced, 12 point Times or metrically equivalent font). No figures or tables should be included in the paper. Evaluation is based on clarity, accuracy and completeness, and special consideration will be given to the novelty and originality of the proposal. Students who do not comply with the guidelines described above will have 5% deducted from the term paper’s grade. The completed research proposals will be due on Friday April 12<sup>th</sup>, 2023. Without instructor approval, late submissions of the research proposals will not be accepted.

**D. Discussion Participation (25% of final grade).** The engagement and quality of the interactions and discussion each student provides, outside of the group discussion they lead and the required online questions they pose, will constitute the last 25% of their grade. The in-class discussion *as well as* forum interactions beyond the ‘B. Prepared Questions’ will contribute to the student’s grade for this assessment.

### **University of Calgary Academic Integrity Policy**

Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity.

Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional code of conduct and promote academic integrity in upholding the University of Calgary’s reputation of excellence. It is your responsibility to ensure that you have read and are familiar with the student academic misconduct policy: <https://www.ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf>.

### **Department of Psychology Criteria for Letter Grades**

Psychology course instructors use the following criteria when assigning letter grades:

**A+ grade: *Exceptional Performance.*** An A+ grade indicates near perfect performance on multiple choice and short answer exams. For research papers/essays/course projects/presentations, an A+ grade is awarded for exceptional work deserving of special recognition and is therefore not a common grade.

**A, A- Range: *Excellent Performance.*** Superior understanding of course material. Written work is very strong in terms of critical and original thinking, content, organization, and the expression of ideas, and demonstrates student’s thorough knowledge of subject matter.

B Range: *Good Performance*. Above average understanding of course material. Written work shows evidence of critical thinking and attention to organization and editing but could be improved in form and/or content.

C Range: *Satisfactory Performance*. Adequate understanding of course material. Knowledge of basic concepts and terminology is demonstrated. Written work is satisfactory and meets essential requirements but could be improved significantly in form and content. Note: All prerequisites for courses offered by the Faculty of Arts must be met with a minimum grade of C-

D range: *Marginally meets standards*. Minimal understanding of subject matter. Written work is marginally acceptable and meets basic requirements but requires substantial improvements in form and content. Student has not mastered course material at a level sufficient for advancement into more senior courses in the same or related subjects.

F grade: *Course standards not met*. Inadequate understanding of subject matter. Written work does not meet basic requirements. Student has not demonstrated knowledge of course material at a level sufficient for course credit.

**Grading Scale**

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-95%	B	76-79%	C	63-66%	D	50-53%
A-	85-89%	B-	72-75%	C-	59-62%	F	0-49%

It is at the instructor’s discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades. To determine final letter grades, final percentage grades will be rounded up or down to the nearest whole percentage (e.g., 89.5% will be rounded up to 90% = A but 89.4% will be rounded down to 89% = A-).

**Tentative Lecture Schedule**

Date	Topic/Activity/Readings/Due Date
T Jan 10	Winter Lectures Begin – Course introduction & discussion date selection
T Jan 17	Literature search and article selection
R Jan 19	Last day to drop a class without financial penalty
F Jan 20	Last day to add or swap a course
T Jan 24	Cognitive neuroscience methods

F Jan 28	Fee payment deadline for Fall Term full and half courses
T Jan 31	<b>Topic 1 – Human topographical orientation</b>
T Feb 7	<b>Topic 1 – Human topographical disorientation</b>
T Feb 14	<b>Topic 2 – Mood, emotions, and empathy in healthy populations</b>
Feb 19-25	Term break No classes.
T Feb 28	<b>Topic 2 – Mood, emotions, and empathy in clinical populations</b>
T Mar 7	<b>Topic 3 – Neuroplasticity in healthy populations</b>
T Mar 14	<b>Topic 3 – Neuroplasticity in populations with brain damage</b>
T Mar 21	<b>Guest lecture</b>
T Mar 28	Research Proposal Review and Discussion
T Apr 4	<b>Topic 4 – Consciousness in healthy populations</b>
T Apr 11	<b>Topic 4 – Consciousness disorders in populations with brain-damage</b> Last day of classes, last day to withdraw from winter semester
F Apr 15	<b>Research Proposal Due</b>
Apr 19-29	Final Exam Period

**Extra Research Participation Course Credit is Not Offered for this Course**

**Absence From A Test/Exam**

Makeup tests/exams are **NOT** an option without the approval of the instructor. Students who miss a test/exam have up to 48 hours to contact the instructor to ask for a makeup test/exam. It's the instructor's discretion if they will allow a make-up exam. Students who do not schedule a makeup test/exam with the instructor within this 48-hour period forfeit the right to a makeup test/exam. At the instructor's discretion, a makeup test/exam may differ significantly (in form and/or content) from a regularly scheduled test/exam. Once approved by the instructor, a makeup test/exam must be written within 2 weeks of the missed test/exam on a day/time scheduled by the instructor. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam <https://www.ucalgary.ca/registrar/exams/deferred-exams>.

**Travel During Exams**

Consistent with University regulations, students are expected to be available to write scheduled exams at any time during the official December and April examination periods. Requests to

write a make-up exam because of conflicting travel plans (e.g., flight bookings) will NOT be considered by the department. Students are advised to wait until the final examination schedule is posted before making any travel arrangements. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam <https://www.ucalgary.ca/registrar/exams/deferred-exams>. Students with an exceptional extenuating circumstance (e.g., a family emergency) should contact the Department of Psychology (psyugrd@ucalgary.ca).

**Reappraisal of Graded Term Work** <http://www.ucalgary.ca/pubs/calendar/current/i-2.html>

**Reappraisal of Final Grade** <http://www.ucalgary.ca/pubs/calendar/current/i-3.html>

### **Academic Accommodations**

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit [www.ucalgary.ca/access/](http://www.ucalgary.ca/access/). Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>.

### **Academic Misconduct**

For information on academic misconduct and its consequences, please see the University of Calgary Calendar at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

### **Instructor Intellectual Property**

Course materials created by professor(s) (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the professor(s). These materials may NOT be reproduced, redistributed or copied without the explicit consent of the professor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

### **Copyright Legislation**

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright ([www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf](http://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf)) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

### **Freedom OF Information and Protection of Privacy**

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary

### **Student Support and Resources**

<https://www.ucalgary.ca/registrar/registration/course-outlines>

### **Important Dates**

The last day to drop this course with no "W" notation and **still receive a tuition fee refund** is **Thursday, January 20, 2022**. Last day add/swap a course is **Friday, January 21, 2022**. The last day to withdraw from this course is **Tuesday, April 12, 2022**.

<https://www.ucalgary.ca/pubs/calendar/current/academic-schedule.html>