

WESTERN UNIVERSITY
LONDON CANADA

Department of Psychology
Fall/Winter 2026

Psychology 4225F Section 001

Individual Differences in Cognitive Neuroscience

Version 07 Aug 2026

1 Calendar Description

This course aims to review progress in understanding interindividual differences in human cognition and their neural underpinnings. Rather than examining how the mind works in general, the focus will be on variations in brain and behaviour across individuals that are tied to creativity, synesthesia, music, imagery, navigation, and autobiographical memory.

Antirequisite(s): Psychology 4195F/G if taken in 2021-22, 2022-23, 2023-24, 2024-25.

Prerequisites: Both Psychology 2801F/G and Psychology 2811A/B, or the former Psychology 2820E, or both the former Psychology 2800E and the former Psychology 2810, PLUS registration in fourth year Main Campus Honours Specialization in Psychology, Honours Specialization in Developmental Cognitive Neuroscience, Honours Specialization in Neuroscience, or Honours Specialization in Animal Behaviour. Fourth year Main Campus Psychology students and Main Campus Psychology Special Students who receive 75% in the prerequisite courses may enrol in this course.

Lecture Hours: 3h

Course Weight: 0.5

Unless you have either the prerequisites for this course or written special permission from your Dean to enrol in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2 Course Information

Instructor:	Dr. Stefan Köhler
Office and Phone Number:	WIRB 5138; 519-661-2111 ext. 86364
Office Hours:	by appointment
Email:	stefank@uwo.ca

Teaching Assistant:	Emily Cordeiro
Office:	by appointment
Office Hours:	by appointment
Email:	ecordei@uwo.ca
Time and Location of Classes:	Tuesday 1:30pm – 4:30pm; TC-204
Delivery Method:	In-Person

3 Course Materials

There will be no textbook for this course. There will be approximately 3 - 5 published scientific papers assigned for each session (primary research papers and reviews). Assigned readings will be made available through links or pdfs on the course website in OWL Brightspace.

4 Course Objectives and Learning Outcomes

Course Objectives

The vast majority of what is currently known about the neural underpinnings of human cognition has come from experimental paradigms that involve averaging of data from multiple subjects, with the goal of deriving conclusions that generalize to a broader population. Yet, psychologists have recognized for a long time that individuals differ in cognitive abilities, cognitive biases, and the cognitive strategies they bring to bear on the kind of tasks employed to understand brain-behaviour relationships. Neuroscientists acknowledge that no two human brains are the same. Variability in brain anatomy and function arises from a mix of genetic and environmental factors, as well as from individuals' unique past learning histories. With the growing appreciation of diversity in society at large, current research in cognitive neuroscience is increasingly turning to a targeted examination of interindividual differences in brain, mind, and behaviour. This trend is going hand in hand with the realization that combining an individual-differences approach with experimental paradigms also helps to improve mechanistic accounts and constrain theories of cognitive phenomena. The general goal of the present course is to review progress in this endeavor in the field of human cognitive neuroscience.

The specific goals are

1. to provide a research-oriented overview of methodology, findings, theories, and contentious issues in the study of interindividual differences in cognitive neuroscience
2. to encourage reading and writing about primary source material in cognitive neuroscience; to encourage critical thinking and to explore the limits of current scientific knowledge in the field; to appreciate the limits of using Artificial Intelligence (AI) for gaining a full understanding and for developing these critical thinking skills
3. to provide training opportunities for public (in-class) presentations on specific research questions in cognitive neuroscience and their empirical study; to offer opportunities for participation in public (in-class) discussion of scientific issues.

Learning Outcomes

Learning Outcome	Learning Activity	Assessment
<i>Knowledge and Understanding</i>		
Understand key concepts and research findings that address how interindividual differences play out in the human mind and brain Understand key methods used to study individual differences in human cognitive neuroscience Appreciate applications of research on individual differences outside the laboratory, and potential translation of findings to the understanding of clinical disorders Appreciate limits of using AI in gaining understanding as learner	Reading Participation in class discussion Preparing class presentations Writing thought papers Writing exams	Quiz exam Class participation Class presentations Thought papers Final exam
<i>Critical Thinking</i>		
Connect, organize, and synthesize research Appreciate limits of current knowledge in research on individual differences Generate questions for follow-up research and design experiments to address them Appreciate limits of using AI in developing critical thinking skills	Preparing class presentations Participation in class discussion Writing thought papers Writing exams	Quiz exam Class presentations Class participation Thought papers Final exam

<i>Communication</i>		
Communicate ideas, methods, and findings from research on individual differences (without AI assistance) in oral form	Participation in class discussion Preparing class presentations	Class participation Class presentations
Communicate ideas, methods, and findings from research on individual differences (with awareness of limitations of AI) in written form	Writing thought papers Writing exams	Quiz exam Thought papers Final exam

5 Evaluation

The evaluation and testing formats for this course were created to assess the learning objectives as listed in section 4 and are necessary for meeting these learning objectives.

Students are expected (i) to attend all classes, (ii) to read and critically think about all assigned course material, and (iii) to actively participate in class discussions. Students will be asked to select 2 research articles for a presentation (typically in groups of 2) and prepare questions for in-class discussion. Students will also be asked to write thought papers on a subset of the course readings. Some of this discussion will take place in break-out groups. A quiz exam will be administered to probe knowledge of foundations and methods early on in the term. A cumulative final exam will be administered that will also include an essay component. Evaluation will be based on five different course components.

Grade breakdown for course evaluation:

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|----|---------------------------------|--------------------|
| 1. | Quiz exam | 15% of total grade |
| 2. | Course participation | 6% of total grade |
| 3. | Final Exam with essay component | 25% of total grade |
| 4. | In-class presentations | 24% of total grade |
| 5. | Thought papers | 30% of total grade |

Quiz Exam

This **45 minute** exam will cover the materials from the lectures, videos, and readings of the initial classes (Introduction, Foundations, Methods, AI use). Mixed format: multiple choice and short answers in essay-writing format (i.e., connected prose). **This is a designated assignment that requires formal supporting documentation if the exam is missed. In other words, students cannot use an undocumented absence for this assessment.**

Thought Papers

Students are required to **write three thought papers (500 - 750 words each)** on assigned readings over the course of the term. Thought papers are intended to be brief reflections on presented articles that are meant to increase students' engagement with select research content. Due dates for these papers will be determined for each student in the first two weeks of the course. **Thought papers must be uploaded to the course website by 12 noon on the due dates** (i.e. typically Monday following the presentations on which they are based). **These deadlines follow the new flexible assessment format with an added grace period of 48h (see implications for consideration and missing course work below).**

Presentations

Students are required to give **two presentations on assigned primary research papers** (one presentation per paper) over the course of the term. Presentations must offer a full summary of the article and will typically be given in **groups of 2 students**. Presentations are expected to be 15 min in length, cannot be read, and must be supported by visual aids (e.g., PowerPoint), followed by a Q & A. Students are encouraged to include questions and comments in their presentations so as to stimulate discussion in the Q & A period. They are also expected to be prepared to answer questions about the articles they present in the Q & A. Presentation dates for each student will be determined in the first two weeks of the course.

Final Exam – with essay format questions

There will be a **2 h final exam**. Mixed format: multiple choice, short answers, essay-style reflections. This exam will cover materials from the entire course; it is a cumulative exam. It will include prompted reflections in connected prose that build on content learned in this course. **The final exam will be scheduled by the Registrar's Office.**

Course Participation

Students are expected to participate regularly in class discussion, and they will be graded based on the extent of their participation. **Attendance is necessary but not sufficient to obtain full marks in course participation.** Students should be prepared to be addressed directly by the course instructor in these discussions.

Policy on Missing Coursework

Thought Papers. Late submissions of the thought papers will not be accepted unless submitted within the 48h grace period specified as part of the flexible assessment format. Please note that because the submission deadline for these assessments already includes flexibility in the form of this grace period, **the instructor reserves the right to deny academic consideration for thought papers that are submitted following the end of the period of flexibility.**

Presentations will be rescheduled if missed. If rescheduling is not feasible, students may be asked to upload a recorded version on OWL Brightspace instead (at a time determined by the

course instructor). If only one of the presenters is available at the assigned presentation spot they will be encouraged to offer their presentation individually. **Presentations missed without rescheduling will be assigned a 0 mark.**

Participation in up to two classes missed due to medical, compassionate, or extenuating circumstances will be reweighted over participation in remaining classes provided the instructor is being informed about this absence prior to the class. **If more than two classes are missed, there will be a loss of 0.5 participation marks for each missed class.** If students require a longer-term accommodation (lasting more than a week) for absences due to medical, compassionate or extenuating circumstances, they are asked to seek formal academic consideration.

Quiz and Final Exams will be rescheduled as make-up exams if missed due to medical, compassionate or extenuating circumstances approved for academic consideration. **The Quiz Exam is a designated assignment that requires formal supporting documentation if the exam is missed. Final Exams scheduled by the Registrar's Office always require documentation if missed. Thus, students cannot use an undocumented absence for either exam.**

Because this is an essay course, as per Senate Regulations, you must pass the essay component to pass the course. **That is, the average mark for your written assignments must be at least 50%.**

This course is exempt from the Senate requirement that students receive assessment of their work accounting for at least 15% of their final grade at least three full days before the date of the deadline for withdrawal from a course without academic penalty.

The Psychology Department follows Western's grading guidelines:

https://www.uwo.ca/univsec/pdf/academic_policies/general/grades_undergrad.pdf

The expectation for course grades within the Psychology Department is that they will be distributed around the following averages:

70%	1000-level to 2099-level courses
72%	2100-2999-level courses
75%	3000-level courses
80%	4000-level courses

In the event that course grades are significantly higher or lower than these averages, instructors may be required to make adjustments to course grades. Such adjustment might include the normalization of one or more course components and/or the re-weighting of various course components.

Policy on Grade Rounding

Please note that although course grades within the Psychology Department are rounded to

the nearest whole number, no further grade rounding will be done. No additional assignments will be offered to enhance a final grade; nor will requests to change a grade because it is needed for a future program be considered.

6 Assessment/Evaluation Schedule

Quiz Exam

There will be a 45 minute quiz exam on **October 6 2026 at 1:30pm**. This quiz will cover the materials from the lectures, videos, and readings of the initial classes (Introduction, Foundations, Methods, AI use). Mixed format: multiple choice and short essay-style answers.

Thought Papers

Due dates for thought papers will be determined for each student at the start of the course (within first 2 weeks). **Thought papers must be uploaded to the course website by 12 noon on these due dates. These deadlines follow the new flexible assessment format with an added grace period of 48h (see implications for consideration and missing course work above).**

Presentations

Presentation **dates will be determined for each student at the start of the course** (within first 2 weeks).

Final Exam

There will be a **2 hour in-class final exam** in the **final-exam period** that will be scheduled by the Registrar's Office. This exam is cumulative and may cover the materials from the lectures, videos, readings, and presentations of the entire course. Mixed format: multiple choice, short answers, essay-style reflections.

7 Class Schedule

Date	Topic	Student Presentations
September 15 2026	General Introduction	No
September 22 2026	Foundations & Methods I (recorded; Instructor absent)	No
September 29 2026	Foundations & Methods II	No
October 6 2026	Quiz Exam + Discussion of AI use	No
October 13 2026	Reading Week – No class	No
October 20 2026	Cognitive domain: Pitch perception	Yes
October 27 2026	Cognitive domain: Face perception	Yes
November 3 2026	Cognitive domain: Synaesthesia	Yes
November 10 2026	Cognitive domain: Navigation	Yes
November 17 2026	Cognitive domain: Imagery	Yes
November 24 2026	Cognitive domain: Autobiographical memory	Yes
December 1 2026	Cognitive domain: Curiosity	Yes

December 8 2026	Cognitive domain: Creativity	Yes
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8 Academic Integrity

Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Possible penalties for a scholastic offence include failure of the assignment/exam, failure of the course, suspension from the University, and expulsion from the University.

Statement on Use of Electronic Devices

Use of laptops is allowed only for accessing course material and for taking notes during classes. No other electronic devices are allowed. No electronic devices are allowed during in-class exams.

Plagiarism Detection Software

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western and Turnitin.com.

Use of AI

Responsible use of AI is allowed in Psychology. This includes using AI for brainstorming, improving grammar, or doing preliminary/background research on a topic.

AI is **not** to be used in place of critical thinking.

The misuse of AI undermines the academic values of this course. Relying on AI to create full drafts or fabricate sources is prohibited. You are ultimately responsible for any work submitted, so it is highly advised that you critically review any Generative AI output before incorporating this information into your assignments.

If you use AI, you must clearly explain its role in your work. All written assignments will require an AI Usage Statement, in which you will indicate what tools you have used, what you have used them for, and (broadly) how you have modified this information. Assignments without an AI Usage Statement will not be accepted.

Violations of this policy will be handled according to Western's scholastic offense policies.

9 Academic Accommodations and Accessible Education

View Western's policy on academic accommodations for student with disabilities at this [link](#).

Accessible Education provides supports and services to students with disabilities at Western. If you think you may qualify for ongoing accommodation that will be recognized in all your courses, visit [Accessible Education](#) for more information. Email: aew@uwo.ca Phone: 519 661-2147

10 Absence & Academic Consideration

Academic Considerations:

https://registrar.uwo.ca/academics/academic_considerations/index.html

11 Other Information

- Office of the Registrar: <https://registrar.uwo.ca>
- Student Development Services: www.sdc.uwo.ca
- Psychology Undergraduate Program:
<https://www.psychology.uwo.ca/undergraduate/index.html>

Students who are in emotional/mental distress should refer to Health and Wellness@Western <https://www.uwo.ca/health/> for a complete list of options about how to obtain help.

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you.

If you wish to appeal a grade, please read the policy documentation at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/appealsundergrad.pdf. Please first contact the course instructor. If your issue is not resolved, you may make your appeal in writing to the Undergraduate Chair in Psychology (psyugrd@uwo.ca).

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