

WESTERN UNIVERSITY
LONDON CANADA

Department of Psychology
Fall/Winter 2026

Psychology 3485F Section 001
Research in Developmental Cognitive Neuroscience

1 Calendar Description

An introduction to the design, administration, and interpretation of developmental cognitive neuroscience research. Students receive instruction in the formulation of developmental research questions and the choice of appropriate methods, and training in the analysis and interpretation of pediatric evoked response potential (ERP) and functional magnetic resonance imaging (fMRI) data.

Antirequisite: Not applicable

Prerequisite: Both Psychology 2801F/G (or one of Health Sciences 2801A/B, Psychology 2840F/G, Psychology 2855F/G) and Psychology 2811A/B (or one of Biology 2244A/B, Economics 2122A/B, Economics 2222A/B, Geography 2210A/B, Health Sciences 3801A/B, MOS 2242A/B, Psychology 2830A/B, Psychology 2850A/B, Sociology 2205A/B, Statistical Sciences 2035, Statistical Sciences 2141A/B, Statistical Sciences 2143A/B, Statistical Sciences 2244A/B, Statistical Sciences 2858A/B, the former Social Work 2207A/B), or both the former Psychology 2800E and the former Psychology 2810, and one of Psychology 2040A/B, Psychology 2410A/B, Psychology 2220A/B, Psychology 2221A/B, or Neuroscience 2000, PLUS registration in third or fourth year Honours Specialization in Psychology, Honours Specialization in Developmental Cognitive Neuroscience or, Honours Specialization in Neuroscience. Third or fourth year Psychology Majors and Psychology Special Students who receive 70% or higher in both Psychology 2801F/G (or 70% or higher in one of Health Sciences 2801A/B, Psychology 2840F/G, Psychology 2855F/G) and Psychology 2811A/B (or 70% or higher in one of Biology 2244A/B, Economics 2122A/B, Economics 2222A/B, Geography 2210A/B, Health Sciences 3801A/B, MOS 2242A/B, Psychology 2830A/B, Psychology 2850A/B, Sociology 2205A/B, Statistical Sciences 2035, Statistical Sciences 2141A/B, Statistical Sciences 2143A/B, Statistical Sciences 2244A/B, Statistical Sciences 2858A/B, the former Social Work 2207A/B), or 70% or higher in the former Psychology 2820E (or 60% or higher in the former Psychology 2800E and the former Psychology 2810), plus 60% or higher in one of Psychology 2040A/B, Psychology 2410A/B, Psychology 2220A/B, Psychology 2221A/B, or Neuroscience 2000 also may enrol in this course.

2 lecture hours; 2 tutorial hours; 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: J Bruce Morton
Office: WIRB5178
Office Hours: By appointment
Email: bmorton3@uwo.ca

Teaching Assistant: Nya Yazdi
Office: WIRB 5th floor
Office Hours: By appointment
Email: nyazdi2@uwo.ca

Time and Location of Classes:

Lectures: Tuesday 9:30 – 11:30am; WIRB1170
Tutorials: Thursday 9:30 – 11:30am; WIRB1170

3 Course Materials

Lecture slides for PSY3485 are available in the Resources folder of the OWL Brightspace website for the course.

Required readings for PSY3485 are available in the Resources folder of the OWL Brightspace website for the course and have been drawn from:

Huettel, S. A., Song, A. W., & McCarthy, G. *Functional Resonance Magnetic Imaging, 3rd Edition*. Sunderland MA: Sinauer Associates.

Software for PSY3485 will be distributed through the Resources folder of the OWL Brightspace website for the course and is supported by MATLAB. To run the software, you will first need to install MATLAB on your personal computer. MATLAB is available for free through the ITS website:

<https://wts.uwo.ca/sitelicense/matlab/>

4 Course Objectives and Learning Outcomes

After successfully completing this course, students should be able to:

Learning Outcome	Learning Activities	Assessment
Depth and Breadth of Knowledge		
Identify (I), describe (De), and explain (E) concepts related to paediatric neuroimaging.	Reading. Class discussion. Group exercises.	Examination (IDeE) Group presentation (DeE) Writing assignment (DeE)
Knowledge of Methods		
Understand biophysical basis of MR signal. Understand different experimental designs used in cognitive neuroscience research. Discuss ethical issues surrounding use of MRI with children.	Assigned readings. Class discussion. Lectures.	Writing assignment (Pr,Im,In,Id,Co,Di) Examination (Co, Di,In,Id) Group presentation (Pr,Im,In,Id,Co,Di,Ci)
Application of Knowledge		
Propose a falsifiable hypothesis about age-related change in brain activity. (Pr) Implement an analysis strategy for testing the hypothesis with fMRI data (Im). Interpret results of an fMRI analysis (In).	Reading. Class discussion. Group exercises. Computer assignment.	Computer assignment (Im). Writing assignment (Pr,Im,In,Id,Co,Di) Examination (Co, Di,In,Id) Group presentation (Pr,Im,In,Id,Co,Di,Ci)
Communication Skills		
Write a well-structured scientific research paper. Prepare and present an oral report of primary research findings.	Oral group presentation Written assignments.	Oral group presentation Writing assignment.
Autonomy and Professional Capacity		
Collaborate with peers. Prepare for learning. Manage large data sets.	Group project. Assigned readings and lecture slides.	Writing assignment (Pr,Im,In,Id,Co,Di) Examination (Co, Di,In,Id) Group presentation (Pr,Im,In,Id,Co,Di,Ci)

5 Evaluation & Policy on Missing Coursework

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. The evaluation components of the course consist of the following:

Computer Assignment: 10%
Due Tuesday, September 29, 11:59pm*

Writing Assignment – Introduction only: 15%
Due Tuesday, October 27, 11:59pm*

Midterm exam: 30%
Tuesday, November 3, 9:30am in-class

Group Presentation: 20%
November 24/26, in-class

Writing Assignment – Complete document: 25%
Saturday, December 5, 11:59pm*

*The listed due date is flexible. Students have an additional 4 days to complete this coursework.

The **Computer Assignment** will be an exercise in MATLAB in which students need to open an fMRI data set and view data using figures and plots. *Please note that because the submission deadline for this assessment (Tuesday, September 29, 11:59pm) already includes flexibility in the form of a four-day grace period (up to Saturday, October 3, 11:59pm), the instructor reserves the right to deny academic consideration for assignments which are submitted following the end of the period of flexibility. Late assessments without academic consideration following the period designated above will be subject to a late penalty of 5%/day.*

Writing Assignment – Introduction only will be a 5- to 7-page document in which reviews extant literature, proposes a falsifiable hypothesis, and a design for testing the hypothesis via fMRI. This Introduction will form the first part of the Writing Assignment – Complete document. *Please note that because the submission deadline for this assessment (Tuesday, October 27, 11:59pm) already includes flexibility in the form of a four-day grace period (Saturday, October 31, 11:59pm), the instructor reserves the right to deny academic consideration for assignments which are submitted following the end of the period of flexibility. Late assessments without academic consideration following the period designated above will be subject to a late penalty of 5%/day.*

The **Midterm exam** will be a mixed format MC and SA questions based on readings, lectures, and in-class discussions. No electronic devices will be allowed. *Please note that this assessment is central to the learning objectives for this course. Accordingly, students seeking*

academic consideration for this assessment will be required to provide formal supporting documentation. Students who are granted academic consideration for this assessment will be provided one opportunity write a make-up exam no more than 1 week following the scheduled Midterm exam.

Group presentations are shared research presentations required of each research group in the class. Group presentations will be approximately 20 minutes in duration and will provide an Introduction, discussion of the Methods and Analyses, an overview of the Results, and a Discussion of the findings. Use of Powerpoint slides is strongly encouraged. *Students that are unable to participate in their group presentation may consider declaring an undocumented absence for this component of their evaluation. Should they do so, the grade for the Complete Writing Assignment (i.e., final paper) will be re-weighted from 25% to 45% to make-up the missing 20% of the final grade apportioned to the group presentation.*

The Writing Assignment – Complete document will be a 20-page write-up of the students developmental fMRI research project. Although the balance of the intellectual work that forms the basis of the writing assignment will be completed in collaboration with members of the group, each student is expected to prepare and submit their own written write up of the experiment. *Please note that because the submission deadline for this assessment (Saturday, December 5, 11:59pm) already includes flexibility in the form of a four-day grace period (Tuesday, December 8, 11:59pm), the instructor reserves the right to deny academic consideration for assignments which are submitted following the end of the period of flexibility. Late assessments without academic consideration following the period designated above will be subject to a late penalty of 5%/day.*

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

Tuesday, September 29: Computer Assignment due on OWL

Tuesday, October 27: Introduction due on OWL

Tuesday, November 3: MIDTERM EXAM

Tuesday, November 24/26: Group Presentations

Saturday, December 5: Final draft of the Writing Assignment due on OWL

7 Class Schedule

Date	Topics	Readings	Special notes
September 15	Introduction to Research in DCN. Formulating a research question.		
September 22	fMRI Signal & Measurement Experimental Design Intro to MATLAB	Chapter 9 (required) Chapter 3 (optional)	Computer assignment assigned
September 29	Ethics Pre-processing	Chapter 8 Burgund et al, 2002, NeuroImage	Computer assignment due
October 6	Single-subject (or first-level) analysis: Introduction to General Linear Modeling	Chapter 10, pp. 331 - 357	

October 13	Reading week		
October 20	Group (or second-level) analysis Statistical thresholds	Chapter 10, pp. 357 - 369	
October 27	Putting the pieces together	Wilk, H. A., & Morton, J. B. (2012). <i>NeuroImage</i> , 63(1), 475-484.	Introduction due
November 3	MIDTERM EXAM		
November 10/12	Group work		
November 17/19	Group work		
November 24/26	GROUP PRESENTATIONS		
December 1	Feedback on presentations		
December 5	Final paper due on OWL		

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

No electronic devices will be allowed during the midterm exam.

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

The use of generative AI tools such as ChatGPT to produce written work is not permitted unless permission is granted by the instructor for specific circumstances. Any work submitted must be the work of the student in its entirety unless otherwise disclosed. When used, AI tools should be used ethically and responsibly, and students must cite or credit the tools used in line with the expectation to use AI as a tool to learn, not to produce content.

AI Policy for Psychology

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 your 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.

Multiple Choice Exams

Computer-marked multiple-choice tests and/or exams will be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Exam Proctoring Software

Tests and examinations for online courses may be conducted using a remote proctoring service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at: <https://remoteproctoring.uwo.ca>.

Personal Response Systems ("Clickers")

In classes that involve the use of a personal response system, data collected will only be used in a manner consistent to that described in this outline. It is the instructor's responsibility to make every effort to ensure that data remain confidential. However, students should be aware that as with all forms of electronic communication, privacy is not guaranteed.

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: aeu@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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