

PNB 3EE3 – Perception Lab

2026 Winter Term

Instructor: Lauren Fink | **E-mail:** finkl1@mcmaster.ca

Instructional Assistants:

Maya Flannery (flannerm@mcmaster.ca) | Alexander Nguyen (nguya88@mcmaster.ca)

Course Description

This course covers the fundamentals of human perception: from understanding the empirical literature, to designing and programming perception-related experiments, to analyzing and communicating research data. Students will learn critical research skills, like computer programming, peer feedback, group collaboration, experimental design, data analysis, data visualization, scientific writing, and communication of research findings. Previous programming experience is not an explicit requirement, though highly beneficial. Students without programming experience should be highly motivated to learn. This course will prepare students for future research opportunities, like a thesis project in year 4 or graduate-level research.

Prerequisite(s): Credit or registration in PNB 3XE3 and registration in Level III or above of an Honours or Combined Honours Psychology, Neuroscience & Behaviour program; or ISCI 2A18 A/B

Antirequisite(s): N/A

Course and Learning Objectives

Learning Objectives

Upon completion of this course, the student will be able to:

- Explain the fundamentals of human perception research, including how researchers can measure perceptual experience.
- Read, understand, and critique primary scientific research literature.
- Design and test their own research ideas, including programming basic perception experiments.
- Understand best practices in open science and use relevant tools, like GitHub, R, and jsPsych.
- Work with data; visualize and analyze results.
- Write, discuss, and review primary research reports in collaborative environments.

Class Activities:

The course will primarily be taught through presentations, discussions, hands-on workshops, and group collaboration. As a lab course, students are expected to be present and active during all sessions, except for excused absences. The course will heavily rely on collaboration with peers, as well as student-led discussions.

Materials & Fees

Required Materials/ Resources

- A computer with internet access is a necessity. Should any student of the course not have a laptop, or access to computing equipment, please email the instructor ahead of the course start so an arrangement can be made. Here are some suggested minimum requirements for your computer: <https://uts.mcmaster.ca/technology-resources-for-mcmaster-students/#tab-content-device-recommendations>
- All students should create a GitHub Education account, before the first day of class, following the instructions here: <https://github.com/edu>
- Students do not need to purchase textbooks or software for this course. Specific links to download the papers, code, and experiment platforms we will be working with throughout the course will be provided throughout the course.
 - The main text we will be using for the course is called Experimentology and is available freely online here: <https://experimentology.io/>
 - A website outlining the course and all its content and assignments is available publicly, here: <https://perception-lab-pnb3ee3.github.io/courseBook/>

Virtual Course Delivery

This class takes place in person. Should extenuating circumstances necessitate virtual course delivery, it is expected that you have reliable access to the following:

- A computer that meets performance requirements [found here](#).
- An internet connection that is fast enough to stream video.
- Computer accessories that enable class participation, such as a microphone, speakers and webcam when needed.

If you think that you will not be able to meet these requirements, please contact uts@mcmaster.ca as soon as you can. Please visit the [Technology Resources for Students page](#) for detailed requirements. If you use assistive technology or believe that our platforms might be a barrier to participating, please discuss with the instructor and/or contact [Student Accessibility Services, sas@mcmaster.ca](mailto:sas@mcmaster.ca), for support.

Course Overview and Assessment

Evaluation

Assessments	Weight
Assignments & Quizzes	34%
- jsPsych 1 assignment (5% P/F) & quiz (2%)	7%
- jsPsych 2 assignment (5% P/F) & quiz (2%)	7%
- Experimentology quizzes (5% x 4)	20%
In-class participation	15%
(includes coming to class + tutorial, prepared and participating in activities)	
Pre-registration	15%
Experiment presentation code	12%
Experiment analysis code	12%
Poster presentation	12%

Note. All rubrics provided at the end of this document

Requests for Relief for Missed Academic Term Work

[McMaster Student Absence Form \(MSAF\)](#): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

Requests for missed academic work worth less than 25% of the final grade resulting from personal or medical situations, lasting up to 3 calendar days, can be reported, once per term, without documentation, using the McMaster Student Absence Form (MSAF). Relief for missed work for a longer duration or for other reasons must be reported to your Faculty office, and relief from term work may not necessarily be granted. When using the MSAF, report your absence to the course instructor or designate. You must then contact the Instructor/Instructional Assistant/other immediately (normally within 2 working days) by e-mail. Please refer to the contact list on the first page of this outline for appropriate e-mail addresses. The Instructor/Instructional assistant will indicate what relief may be granted for the work you have missed, and relevant details such as revised deadlines, or time and location of a make-up exam/quiz/test. Please note that the MSAF may not be used for final deliverables, nor can it be used for a final examination or its equivalent. Please review and follow the Academic Regulation in the Undergraduate Calendar under “Requests for Relief for Missed Academic Term Work”.

Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact [Student Accessibility Services \(SAS\)](#) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University’s [Academic Accommodation of Students with Disabilities](#) policy.

Academic Accommodation for Religious, Indigenous Or Spiritual Observances (Riso)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the [RISO](#) policy. Students should submit their request to their Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Courses with An On-Line Element

In this course, we will be using the Avenue to Learn tool and GitHub. Students should be aware that, when they access the electronic components of a course, private information such as first and last names, user names, McMaster emails, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss with the course instructor.

Online Proctoring

We will not be using online proctoring software in this course.

Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

It is your responsibility to understand what constitutes academic dishonesty.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the [Academic Integrity Policy](#), located at <https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/>

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

Authenticity / Plagiarism Detection

We will not be using plagiarism detection software in this course. Students are expected to turn in original writing and research. GENERATIVE AI SHOULD NOT BE USED TO COMPLETE ANY OF THE ASSIGNMENTS, unless explicitly discussed in class. For more information about academic integrity, please go to the [McMaster Office of Academic Integrity](#).

Generative AI (ChatGPT, Co-Pilot, Bing, etc.)

Unless otherwise stated in class or in the context of an assignment, students should assume that generative AI should not be used to complete assignments. Any usage of such tools must be explicitly described in an addendum to the assignment and cited appropriately. Please note that none of the assignments involve a reduction of marks because of grammar. If you are a non-native English speaker using AI tools to correct minor grammar mistakes, please do not. We want to hear your unique voice. As long as what you have written is comprehensible, we will not deduct points based on grammar. On the contrary, even with correct grammar, ill-formed ideas or poorly communicated concepts will lose points. Generative AI often produces grammatically correct, but conceptually misguided output.

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all our living, learning and working communities. These expectations are described in the [Code of Student Rights & Responsibilities \(the “Code”\)](#). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Research Ethics

Research done in this laboratory course will be simulated (i.e., the instructors or students will simulate hypothesized distributions of variables). Students will not collect data from each other, except, perhaps, in the form of pilot data. Should any group wish to actually carry out their research study (after the course), with external research participants, research ethics approval must be attained. We do have a course-based ethics approval in place (MREB #5805) to cover the methods we will use in class and piloting experiments amongst ourselves. You can read more about the McMaster Research Ethics Board and their process at:

<https://research.mcmaster.ca/home/support-for-researchers/ethics/mcmaster-research-ethics-board-mreb/>.

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.

McMaster Resources

| [Writing and Academic Skills](#) | [McMaster University Libraries](#) | [Generative AI](#) | [Mental Health](#) | [Nutrition](#) | [Community Fridge](#) | [Student Wellness](#) | [Phone lines \(immediate support\)](#) |

RUBRICS

Participation Rubric:

Every three weeks your TA will assign you a grade using the rubric below.

CONTRIBUTION TO THE COURSE

	Excellent	Good	Fair	Poor
(3 of 3)	10	8	8	4
(2 of 3)	6-8	4-6	2-4	0-2
(1 of 3)	4	2	0	0

EVALUATING CONTRIBUTIONS

Excellent	Frequent & stimulating
Good	Frequent & valuable
Fair	Occasional & Forced
Poor	Infrequent & Irrelevant

Pre-Registration Rubric:

Student:					Date:	
Title:					Score:	/32
Missing	Poor (Below Expectation)	Fair (Changes Needed)	Good (Minor Errors)	Excellent (Meets/Exceed Expectations)		
0	1	2	3	4		
Presentation		Score	Comments			
All sections completed according to provided template		/4				
Structure and Content		Score	Comments			
Clear background provided for the research topic / question. Hypothesis/es clearly stated.		/4				
At least 10 peer-reviewed references incorporated into the pre-registrations		/4				
Proposed study design and methods logically follow from background. Choices are well-motivated from previous literature / best practices.		/4				
The proposed study fills a clear gap in the existing literature. The gap is well articulated.		/4				
The study design is not more complex than a 2x2		/4				
Study design, measured and manipulated variables, expected outcomes, etc. are all defined in enough detail that others could understand and produce the experiment.		/4				
Planned data transformations and statistical analyses are appropriate for the proposed study design		/4				

Experiment Presentation Code Rubric:

Student:					Date:	
Title:					Score:	/32
Missing	Poor (Below Expectation)	Fair (Changes Needed)	Good (Minor Errors)	Excellent (Meets/Exceed Expectations)		
0	1	2	3	4		
Presentation		Score	Comments			
The experiment runs without error from start to finish		/4				
The experiment is user-friendly and intuitive; all content displays properly (e.g., text, images, sound).		/4				
Participant instructions and questions are clear.		/4				
Structure and Content		Score	Comments			
All files required to run the experiment have been submitted		/4				
The code is well-commented, such that others can understand it		/4				
The code is well-structured (e.g., timeline, variables, etc. follow logical organization and naming conventions)		/4				
Data required for subsequent analyses are saved with logical and organized variable names		/4				
A clear and organized README.md file is included in your experiment repository, instructing others how to use and interact with your code		/4				

Experiment Analysis Code Rubric:

Student:					Date:	
Title:					Score:	/32
Missing		Poor (Below Expectation)	Fair (Changes Needed)	Good (Minor Errors)	Excellent (Meets/Exceed Expectations)	
0	1		2	3	4	
Presentation		Score	Comments			
The code notebook runs without error from start to finish		/4				
Compelling in-line data visualizations are included and follow best practices in terms of visual display (color, labels, etc.)		/4				
Structure and Content		Score	Comments			
All files/dependencies required to run the code have been submitted		/4				
The code notebook is well-commented, such that others can understand it		/4				
The notebook is well-structured (e.g., logical organization and naming conventions). Others can easily follow the logic and order of analyses.		/4				
Data cleaning, pre-processing, and/or transformations, make sense and are appropriately documenting		/4				
Statistical tests are included and appropriate for the type of data being analyzed.		/4				
Data visualizations highlight or complement statistical results and are appropriate for the data type(s). Axes and other plot elements are appropriately labelled.		/4				

Poster Presentation Rubric:

Presenter:				Date:	
Title:				Score:	/32
Missing	Poor (Below Expectation)	Fair (Changes Needed)	Good (Minor Errors)	Excellent (Meets/Exceed Expectations)	
0	1	2	3	4	
Presentation		Score	Comments		
Overall poster is well-designed, does not tax perception, attention or memory of audience members		/4			
Speech is engaging, well-paced, informative		/4			
Structure and Content		Score	Comments		
Clear background provided for the research topic / question. Hypothesis/es clearly stated.		/4			
Methods summarized well and in sufficient but not excessive detail		/4			
Expected results are clear through visualizations of simulated data, and relation to hypothesis/es.		/4			
Figures designed according visualization best practices		/4			
Clear discussion / conclusion and implications		/4			
Logical flow and structure of presentation		/4			