Research Methods in Sensation and Perception Syllabus

Department of Psychology and Neuroscience

NESC / PSYO 3051 Fall 2026

Dalhousie University operates in the unceded territories of the Mi'kmaw, Wolastoqey, and Peskotomuhkati Peoples. These sovereign nations hold inherent rights as the original peoples of these lands, and we each carry collective obligations under the Peace and Friendship Treaties. Section 35 of the Constitution Act, 1982, recognizes and affirms Aboriginal and Treaty rights in Canada.

We recognize that African Nova Scotians are a distinct people whose histories, legacies, and contributions have enriched the part of Mi'kma'ki known as Nova Scotia for over 400 years.

Course Instructors

Name	Email	Office Hours
Dr. Nathan Crowder	nathan.crowder@dal.ca	online, by appointment
Nicole Michaud	nicolemichaud@dal.ca	online, by appointment

Course Description

[From Calendar] A hands-on course that explores sensory perception with an emphasis on data collection, analysis, and interpretation. Several methodologies are used across the different senses to study perception and its neural underpinnings.

Course Prerequisites

[From Calendar] PSYO 2000.03 or NESC 2007.03, NESC/PSYO 2470.03 or PSYO 2770.03, and NESC/PSYO 2150.03.

Learning Outcomes

- Quantitatively define a visual stimulus and describe how the retinal image is formed.
- Develop techniques and strategies to explore perceptual phenomena qualitatively and quantitatively.
- Gain hands-on experience testing participants on psychophysical experiments
- Write lab reports that organize, analyze, and appraise experimental data collected during lab(s).
- Perform basic data analyses on the responses from sensory neurons.

Student Resources

Office hours: Office hours will occur online via Microsoft Teams.

Course Structure

Course Delivery

Lectures (LSC-COMMON C214): *In-person*. Mon., Wed., and Fri. 10:35-11:25am

Some background material may be delivered *asynchronously* (via Panopto on Brightspace).

Laboratory (LSC-PSYCHOLOGY P5257): *Blended*. Mon. 9:35-10:25am is booked for common laboratory time, but most data collection will occur outside of class time. Physical laboratory equipment will be accessible in P5257.

Notes on blended course delivery:

- Online Content will be delivered via Brightspace.
- Minimum technology: this course requires internet access, sufficient hardware to navigate Brightspace (e.g. view lecture PDFs and Panopto videos, download files), and to engage in Microsoft Teams consultations during 'office hours'.
- The instructor and TA are to be contacted by email only.
- All due dates, meetings, etc. are scheduled on Halifax Time (GMT-3).
- If students connect to online resources from outside Canada, they are responsible for ensuring awareness and compliance with any applicable laws in the country from which they are connecting.

Course Materials

Many of the topics covered in this course are built on the foundation of material covered by NESC/PSYO 2150, so the textbook for that course (E. Bruce Goldstein, Sensation and Perception, 8-11th editions. Thomson/Wadsworth) serves as a suggested reference.

Web-based lab resources are hosted by several third parties:

1. Blindspot mapping tool [https://avtanski.net/projects/blindspot/].
2. Professor Michael Bach of Freiburg University [https://michaelbach.de/ot/index.html].
3. Interactive Sensation Laboratory Exercises (ISLE) [https://isle.hanover.edu/]
4. Online hearing test for auditory thresholds [https://audionotch.com/hearing-test/]
5. Psychoacoustics tone discrimination [https://psychoacoustics.dpg.psy.unipd.it/sito/]

Brightspace site: This site will be used for making announcements regarding class meetings and assessment components, posting lecture slides, lab assignments, grades, etc. **You are expected to check Brightspace regularly for new content, announcements, and potential schedule changes.** If you have difficulties accessing or using Brightspace, please contact the folks at UCIS/WebCT for help.

Lecture Notes: Lecture notes are the students' responsibility. PDF files of PowerPoint slides covering the background material for labs/assignments will be posted on the Brightspace site. However, these slides are not complete and will need to be supplemented by notetaking.

Assessments / Course Content

Topic	Component	Weight (% of final grade)*	Due Date
1. Optics, the eye, and visual acuity	1.1: Mapping your blind-spot in-class assignment (ICA)	3%	Sept. 14, 2026
	1.2: Retinal image worksheet	6%	Sept. 21, 2026
	1.3: Acuity partial lab report	15%	Oct. 5, 2026
2. Special properties of vision	2.1: Depth (Howard-Dolman box worksheet)	8%	Oct. 12, 2026
	2.2: Motion (Random dot kinematogram ICA)	6%	Oct. 7, 2026
3. Audition	3.1: Auditory thresholds worksheet	8%	Oct. 19, 2026
	3.2: Tone discrimination worksheet		
4. Touch	4.1: Haptic object identification ICA	6%	Oct 21, 2026

	4.2: Two-point threshold worksheet	8%	Oct. 30, 2026
5. Adaptation and population analysis	5.1: Contrast adaptation lab report	20%	Nov. 23. 2026
6. Neural underpinnings of perception	6.1: RF mapping worksheet	10%	Dec. 7, 2026
	6.2: Excel-based neural analysis	10%	Dec. 10, 2026

Conversion of numerical grades to final letter grades follows the Dalhousie Grade Scale:

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (0-49)
A- (80-84)	B- (70-72)	C- (55-59)	

Course Policies

1. Missed Assessment Policy

Missing an assessment is unacceptable for any reason other than contagious illness, or emergency. If you are unable to complete an assignment/lab etc. by the deadline, you must inform Dr. Crowder by email, and submit a STUDENT DECLARATION OF ABSENCE (SDA) using Brightspace only (do not email SDAs or drop SDAs off in person).

- The Student Declaration of Absence form may only be used a maximum of **2 times** throughout the term and may only cover **3 consecutive days of absence**.
- Students who are ill for an extended period and thus miss multiple requirements will be referred to Patricia Laws, Assistant Dean (Student Affairs).

IMPORTANT: ***All assessment components must be completed.*** Submitting an SDA only changes the due date. Missed assessment components receive a grade of zero.

2. Late Assignment Policy

Assignments that are not turned in on time may be penalized. Lab reports, worksheets, excel assignments, etc. may be fined up to a maximum of 5% for every day they are overdue. If you cannot turn in an assignment on time due to illness, you must provide documentation (see Missed Assessment Policy above).

3. Assignment Completion Norms

Students are to complete all work (worksheets, assignments, reports, etc.) alone, and will be expected to follow the Student Code of Conduct and Academic Integrity policies. Some laboratory data collection will require students to work in partners, in this case the ***data itself is shared*** among the partners, but ***all analysis, interpretation, and writing must be performed by students individually***.

4. Artificial Intelligence (AI)

Use of AI in this course is not recommended. However, Microsoft 365 Copilot Chat may be used to support lab preparation and exploring background content (e.g. to generate practice questions, topic summaries, etc.), but not the production of *assessed* work (see Appendix A for full details).

The only AI tool that is acceptable for uploading course materials for your own learning is Dalhousie's licensed version of **Microsoft 365 Copilot Chat** because it does not infringe copyright under Dalhousie's Microsoft agreement.

Do not upload course materials into any other AI tools - doing so violates Dalhousie's Academic Integrity, Student Code of Conduct, and Fair Dealing (copyright) Polices.

5. Course Accessibility

Refer to the Student Accommodation Policy for more information on how Dalhousie instructors and staff work collaboratively with students to create and sustain an accessible educational environment.

- You are eligible for accommodations based on protected characteristics such as religion. If you have religious, cultural, or community-significant observances that conflict with course requirements, reach out to me to collaboratively find alternatives for completing the course requirements.
- To begin the process of requesting a formal academic accommodation, contact the Student Accessibility Centre

6. E-mail Etiquette

Students often don't appreciate how many emails their professors and TAs receive in a single day, most of which require a response. This year all consultations outside of class will be scheduled by email and may take place in-person or via Microsoft Teams. The TA or I will endeavour to provide a helpful response to your email within *three working days* of receipt. You can facilitate this by making sure that you:

- Read the syllabus and Brightspace page to determine whether the information you require is already available
    - We will not respond to emails that ask about information contained in the course syllabus or on Brightspace - not even to tell you that the email will not be answered
    - Email should not be an alternative to taking the initiative and making the time to look for the information you require
- Enter the course number in the subject line: 3051
- Write in full, grammatically correct sentences
- Proof-read your email message to be sure that it is clear and provides all pertinent information
- Do not write to request an exception to the syllabus
    - All students are subject to all the rules as outlined in this course syllabus and no exceptions will be made to any class policies under any circumstances
- Include your FULL name and Dal student ID

7. Health and Safety Statement

All students are required to comply with health and safety requirements on campus, and should be considerate of others' health concerns. Non-compliance may be reported under the Code of Student Conduct.

8. Online Transition Plan

There is a small chance that the university may require online instruction for some/all classes due to public health related restrictions during the term. For the duration of online instruction, all assessment components will be replaced with equally weighted fortnightly online worksheets. The weight of a valid

missed assessment (see Missed Assessment Policy above) will be equally distributed among the other assessments.

9. Distributing Course Materials

Students will have access to electronic course content throughout this term. However, under no circumstances is such content to be shared, posted online, or distributed in any other way. Personal copies of recordings must be destroyed at the end of term. Furthermore, students do not have permission to revise, modify, share, post on-line, or redistribute in any manner - electronic or otherwise - any of the course materials.

10. Course completion requirement

Academic Calendar regulation 16.1 states: "In order to complete a course satisfactorily, a student must fulfill all the requirements as set down in the course outline [Syllabus].

Course Content

Date	Topic	Item due
Sept. 9	Course intro.	
Sept. 11	Module 1.1: vis stim. + optics	
Sept. 14	Module 1.2: blind spot mapping + in-class writing assignment (ICA), and mod. Trans. Func.	Module 1.1 Blind spot mapping - **data + in-class writing assignment**
Sept. 16	Module 1.2: myopia	
Sept. 18	Module 1.3: background - Acuity vs Hyperacuity partial lab report	
Sept. 21	Module 1.3: methods - hyperacuity	Module 1.2 Retinal image worksheet
Sept. 23	Nicole - lab report overview	
Sept. 25	Nicole - deep dive into Intro + Methods	
Sept. 28	Module 2.1: intro + data collection info (HD box - depth perception)	
Sept. 30	*National Day of Truth and Reconciliation, University closed*	
Oct. 2	Mod 2.1: Sample calcs and amblyopia (HD box - depth perception)	
Oct. 5	Module 2.2: background and data collection info (RDK Motion)	Module 1.3 Acuity **lab report**
Oct. 7	Module 2.2: RDK in-person *ICA* (motion)	Module 2.2 RDK worksheet - **data + in-class writing assignment**
Oct. 9	Module 3.1: Audition - thresholds	
Oct. 12	*Thanksgiving - University Closed*	Module 2.1 HD box worksheet
Oct. 14	Module 3.2: Audition - tone discrimination	
Oct. 16	Module 3.1/3.2: Audition - Threshold/ Discrimination data collection	
Oct. 19	Module 4.1: Haptics background + data collection	Module 3.1/2 Audition Lab worksheet
Oct. 21	Module 4.1: Haptics in-class ICA	Module 4.1 Haptic perception worksheet - **data + in-class writing assignment**
Oct. 23	Module 4.2: 2-point threshold background	
Oct. 26	Module 4.2: 2-point data collection + analysis	
Oct. 28	Module 5.1: Contrast adaptation background	
Oct. 30	Module 5.1: Contrast adaptation data collection + sample calc	Module 4.2- 2 pt threshold Lab worksheet
Nov. 2	no class - collect 5.1 data	

Nov. 4	Nicole - module 1.3 feedback	
Nov. 6	Module 5.1: Contrast adaptation – getting your population data and pop analysis	
Nov. 9	*Fall break - University closed*	
Nov. 11	*Remembrance Day*	
Nov. 13		
Nov. 16	Nicole - Discussion + References deep dive	
Nov. 18	Module 5.1: Q+A about Contrast adaptation statistics/analysis	
Nov. 20	no class - designated writing time	
Nov. 23	Module 5.1: Last minute report Q+A	Module 5.1 Contrast adaptation **lab report**
Nov. 25	Module 6.1: intro to receptive field (RF) mapping	
Nov. 27	Module 6.1: tricks for RF mapping	
Nov. 30	no class - map RFs	
Dec. 2	Module 6.2: intro + Excel use tutorial	
Dec. 4	Mod 6.2: data acquisition	
Dec. 7	Module 6.2: data formatting and graphing	Module 6.1 RF Mapping Lab worksheet
Dec. 8	Module 6.2: analysis and Q+A	
Dec. 9	Extra	
Dec. 10	*No class - Break before exams*	Module 6.2 Excel analysis (PSTH) excel sheet

University Policies and Statements

The link below guides students toward supports, university policies, and guidelines. These resources and policies are now hosted on a website, so they will remain up-to-date even if policies, statements, resources, and guidelines get amended.

Syllabus Appendix: Student Supports & University Statements, Policies, and Guidelines

Appendix A — Artificial Intelligence use in NESC/PSYO 3051

AI and your learning

This course is designed to help you build knowledge and understanding about the psychology and neuroscience of perception. AI tools can help you study, but improper use and/or relying on them to complete assessments meant to test or build your understanding is likely to harm your learning and leave you unprepared for exams, advanced coursework, and research. If you use AI tools, do so in a way that supports rather than undermines your learning.

What AI tools are

AI tools use algorithms and large datasets to generate, summarize, analyze, or revise text, images, or code in response to prompts. Examples include text generators, grammar and editing tools, AI search and summarization tools, and transcription or translation services. They can speed up some tasks, but they do not replace independent thinking, subject knowledge, or scholarly judgment.

Why caution is warranted

AI tools generate text from statistical patterns, not an understanding of truth or evidence; they can produce confident-sounding but incorrect explanations and unreliable or fabricated citations. You remain fully responsible for the accuracy, originality, and integrity of every AI output you use. In particular:

- using AI to complete coursework limits your development in reasoning, data interpretation, and scientific literacy;
- short-term gains from AI can mean weaker preparation for upper-year courses, labs, research, and professional programs;
- relying on AI in place of your own thinking can impair retention, problem-solving, and exam readiness.

AI and academic integrity

In this course, AI use is governed by the same expectations that apply to all academic work under Dalhousie's academic-integrity regulations (i.e. Intellectual Honesty). AI use that replaces or obscures your own intellectual work is unauthorized assistance and a form of academic misconduct. You are also responsible for protecting the privacy and intellectual property of others.

What is and isn't allowed

Permission does not equal endorsement; the primary risk is to your own learning and progression.

1. Learning support and independent study — you may: have concepts explained in different words; generate practice questions or flashcards; summarize lab instructions; clarify terminology or methods.

2. Recordings, slides, and posted materials — you may: create personal summaries, outlines, or study guides, and translate content for accessibility. **You may not:** upload lecture recordings, slides, assessments, or other instructor materials to external AI platforms (these are protected by copyright).

3. Writing mechanics and language — you may: use AI for grammar and spelling, clarity and concision, and reference formatting. Help limited to mechanics is not misrepresentation when the ideas, structure, and analysis are your own.

4. Idea development — you may: brainstorm questions or suggest analytical approaches—provided the final work reflects your own contribution. **You may not:** use AI to generate outlines or complete assessments meant to evaluate your individual learning.

5. Research and sources — you may: identify keywords or themes, get suggestions for literature you then verify, and summarize an article to aid comprehension. **You may not:** cite AI as a scholarly source, include fabricated or unverified references, or present AI-generated writing as your own work.

NESC/PSYO 3051 AI Checklist

Activity	Allowed	Not allowed
Idea generation / brainstorming: exploring initial ideas or outlines for an assignment.	☑	☐
Language assistance: identifying and correcting grammar, spelling, or sentence-structure errors.	☑	☐
Study notes from slides: converting slides into summary notes for personal use (while respecting copyright).	☑	☐
Data analysis: using AI to help analyze data.	☐	☑
Drafting / outlining: using AI to draft or outline part of an assignment.	☐	☑
Completing graded work: using AI to write lab reports or assignments meant to be independent student work.	☐	☑
Non-approved tools: using AI tools other than Dalhousie's licensed Microsoft Co-Pilot.	☐	☑
Uploading course materials: sharing instructor or peer materials with external platforms without written consent / copyright permission.	☐	☑