

NROC64: Sensorimotor Systems

I) Course information

Course number: NROC64H3 S

Online, taped lectures

Prerequisites: (BIOB30H &) NROB60H, exclusion (but not equivalent): PSY290H

II) Instructor:

Dr. Matthias Niemeier
1265 Military Trail SW550
e-mail: psyb51.uts@utoronto.ca
Office Hours: tba

III) Teaching Assistants:

Teddy Cheung, Simar Moussaoui, Nina Lee

IV) Course coverage and goals

A focus on the mechanisms by which the nervous system processes sensory information and controls movement. The topics include sensory transduction and the physiology for sensory systems (visual, somatosensory, auditory, vestibular). Both spinal and central mechanisms of motor control are also covered.

By the end of this course, you will have ...

- developed a foundational understanding of sensorimotor systems
- strengthened your ability to consume scientific literature
- practiced the acquisition of scientific knowledge
- practiced your ability to understand, critique and extend original research in psychology and neuroscience
- trained your ability to effectively communicate scientific knowledge to others

V) Course readings (required/recommended)

A selection of textbook chapters, reviewer articles and research papers will be used. See Excel sheet posted on Quercus

VI) Web pages

Course Web Site: Quercus

Here you will find the syllabus, and announcements. Also, I will put the lecture slides on that page.

Please check on a regular basis for announcements.

VII) Evaluation

4% Quizzes	weekly for lectures 2-11, top 8 quizzes count
13% Thought paper 1	Written assignment, 2 pages, double-spaced
13% Thought paper 2	Written assignment, 2 pages, double-spaced

18% Mid-term test 1 Format: short answer questions. 60 minutes.

18% Mid-term test 2 Format: short answer questions. 60 minutes.

34% Final Term test 90 minutes. Same format as the mid-term

Quizzes are meant to encourage you to read and prepare the material for a given lecture ahead of time and properly prepare the facts for the respective lecture. Given this objective, it follows that there is no opportunity to make up for missed quizzes. That said, only the top 8 quizzes will be counted, i.e., missing a quiz wouldn't impact your grade. The material tested in the quizzes comes from the readings for the respective week. Quizzes will take the first 5-10 min of each lecture. Alternatively, quizzes may be conducted online. If you have scores for more than 8 quizzes I'll pick your top 8 scores.

The **mid-term tests** and **the final exam** will be equivalent in format and will have short-answer questions only. Short answer questions are more suitable for measuring conceptual understanding of material, beyond memorizing and recognizing facts.

Material on the exams will include lecture material and text readings. Although the topics covered will overlap, different things may be emphasized in class than in the book or other readings. I recommend reading all the materials and I do urge you to attend all classes. If you miss a class, please make sure to have someone take notes for you. Lectures will not be recorded, and please do not tape the lectures.

It is important that students can demonstrate their intellectual command of the subject matter of this course *in its entirety* at the end of the term. Consequently, it is essential that the final exam provide a comprehensive (cumulative) assessment of the course.

Missing mid-term. Under exceptional circumstances students may miss a mid-term test (for details see section XI). If you miss a mid-term for a valid reason then all other parts of your evaluation will be re-weighted proportionally (e.g., if you miss mid-term 1 then the weights are as follows: quizzes: 4.88, t-papers: 15.85, mid2: 21.95, final: 41.46). If you miss two mid-terms for a valid reason you will write a cumulative make-up mid-term that covers mid-term 1 as well as 2.

Final Exam Policies & Procedures. The scheduling of final exams and the granting of petitions to defer final exams are matters that fall entirely within the jurisdiction of the Registrar's Office. If you have any concerns relating to your final exam attendance, please contact the Registrar.

Thought papers. There will be 2 written assignments, called 'thought papers'. Each of them will be 2 pages long, double-spaced. The idea is to write about one of your own ideas about one research paper. Format is as follows

- 1 paragraph Introduction beginning with a 2-3 sentence long summary of the article (perhaps preceded by a more general statement about the concept that is investigated etc. – 'bigger picture') about one research article (see marked below). The Introduction needs to end with a thesis statement.
- It follows about 1, 2, 3 paragraphs on your own thought about the article. Focus on one thought only.
- Conclusions: 1 paragraph. Summarize what you've been talking about

More information about the t-papers will be posted on Quercus. This includes a document on how to write the written assignment and 2 sample papers. Submission is by Turnitin. Late submissions mean a deduction of 10% of the thought paper grade per late day. Do make sure you write a genuine paper. We will feed the papers into Turnitin.

Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com website.

Help with Writing

If you would like help with academic writing, the following resources are available to you:

- The Centre for Teaching and Learning (AC312) Writing Centre offers students one-to-one appointments and supplementary materials to help improve upon their writing skills. <http://ctl.utoronto.ca/home/> <http://ctl.utoronto.ca/twc/>
- The English Language Development Centre offers support and specialized writing programs for students who do not speak English as their primary language. <http://ctl.utoronto.ca/eld/>
- Advice on academic writing <http://www.writing.utoronto.ca/advice>

Literature Searches

Students can use the following resources when conducting literature searches to find relevant articles for their presentation and final essay:

The UTSC Library (AC235)

<http://www.library.utoronto.ca/utsc/>

PubMed

<http://www.ncbi.nlm.nih.gov/pubmed>

PsychINFO

<http://www.apa.org/pubs/databases/psycinfo/index.aspx>

Google Scholar

<http://scholar.google.ca/>

Difficulties with the course: Please talk to me if you are having difficulties with the course. The earlier the better. I will try my best and be happy to help. Please note, that as per university policy it is not possible to negotiate better grades for other reasons than merit.

VIII) Schedule

This schedule is subject to changes as we go along, please see Quercus for updates. Bear et al. 2016, Carpenter & Reddi, 2012, and Kandel et al. are textbooks.

Week	Topics	Required readings	Recommended readings
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1	Introduction, Optimal sensorimotor transformation, The retina	Bear et al 2016, chapter 10	
2	Primary visual pathway, Bayesian inference for object perception	Kersten & Yuille Curr Opin Neurobiol 2003	Bear et al 2016, chapter 11
3	Touch/haptics, Proprioception	Lederman & Klatzky Att Perc Psychophys 2009 Carpenter & Reddi, 2012 chapter 5 research article TBD	
4	Optimal multisensory perception, Perception for posture	Ernst & Bühlhoff TICS 2004 Carpenter & Reddi, chapter 11	
5	Mid-term 1 (covers weeks 1-4)		
5	Muscle physiology, Motor pathways	Bear et al 2016, chapter 13 + 14(p.485-491)	
6	Motor systems	Carpenter & Reddi, 2012 chapter 9	
7	Optimal feedback control	Pruszynski & Scott EBR 2012 Scott TICS 2012	
8	Cerebellum, BG	Ramnani Nat Rev Neruosci 2006 Calabresi et al Nat Rev Neruosci 2014, only classic direct/indirect pathways	Ito Nat Rev Neruosci 2008 Bruckner Neuron 2013
	Mid-term 2 (covers weeks 6-9)		
9	Oculomotor system	Goldberg chapter in Kandel et al textbook, -p.792, stop before section on cerebral cortex Coiner et al Brain Struct Funct 2019 research article TBD	
10	Reaching	Vesia & Crawford EBR 2012	

11	Grasping	Janssen & Scherberger Annu Rev Neurosci 2015	supplemental video Blake et al IEEE Proced 4th Int Conf Comp Vis 1993
12	Course review		
	Final (covers weeks 1-12)		

IX) AccessAbility Statement

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in SW302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or ability@utsc.utoronto.ca.

X) Academic Integrity Statement

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to: IN PAPERS AND ASSIGNMENTS: Using someone else's ideas or words without appropriate acknowledgement. Submitting your own work in more than one course without the permission of the instructor. Making up sources or facts. Obtaining or providing unauthorized assistance on any assignment. ON TESTS AND EXAMS: Using or possessing unauthorized aids. Looking at someone else's answers during an exam or test. Misrepresenting your identity. IN ACADEMIC WORK: Falsifying institutional documents or grades. Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes. All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see <http://www.utoronto.ca/academicintegrity/resourcesforstudents.html>).

XI) Missed Term Work due to Medical Illness or Other Emergency:

Psychology Department Missed Term Work Policy, WINTER 2021

For missed term work (assignments and term tests) due to illness, emergency, or other mitigating circumstances, please follow the procedures outlined below.

Notes:

- The following reasons are not considered sufficient for missed term work: travel for leisure, weddings, personal commitments, work commitments, human error.
- Missed Final Exams are handled by the Registrar's Office and should be declared on eService: <http://www.utoronto.ca/registrar/missing-examination>
- Instructors cannot accept term work any later than five business days after the last day of class. Beyond this date, you would need to file a petition with the Registrar's Office: <https://www.utoronto.ca/registrar/term-work>

Accommodations for Illness or Emergency:

For missed work due to ILLNESS OR EMERGENCY, please complete the following **two-step** process:

1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>) and email it to Keely Hicks at keely.hicks@utoronto.ca ,
and
2. **Declare your absence** on [ACORN](#) (Profile & Settings > Absence Declaration)

Deadline: You must complete the above steps **within 3 business days** of the missed work.

Note: For this semester, we do not require any additional supporting documentation (ex. medical notes) to support your missed term work accommodation request.

Accommodations for Academic Conflicts:

For missed term work due to an ACADEMIC CONFLICT (i.e. two quizzes or tests scheduled at the same time), please complete the following process:

1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>), choosing "Other" as your reason for missed work and explaining the conflict in the space provided.
2. Take screenshots of your course homepages that demonstrate the conflict.
3. Email the form and screenshots to Keely Hicks (keely.hicks@utoronto.ca).

Deadline: You should report the conflict to Keely Hicks (keely.hicks@utoronto.ca) **at least two weeks (10 business days) before the date of the activity**, or as soon as possible if it was not possible to identify the conflict earlier.

Note: Multiple assignments due on the same day are not considered conflicts. Accommodations may only be possible in the case of quizzes and tests that are both scheduled during the same discrete period. Back-to-back tests/quizzes are not considered conflicts.

Note: Students are responsible for keeping their course timetables conflict-free. Students who choose to register in two synchronous courses with overlapping lecture/tutorial/lab schedules may not necessarily be accommodated.

Accommodations for Religious Conflicts:

For missed term work due to a RELIGIOUS CONFLICT, please complete the following process:

1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>), choosing “Other” as your reason for missed work and noting “Religious conflict” in the space provided.
2. Email the form to Keely Hicks (keely.hicks@utoronto.ca).

Deadline: You should report the conflict to Keely Hicks (keely.hicks@utoronto.ca) **at least two weeks (10 business days) before the date of the activity**, or as soon as possible if it was not possible to identify the conflict earlier.

Accommodations for Time Zone Conflicts:

If you are physically in a different time zone and a quiz or midterm is scheduled outside of 7:00am to midnight in your local time, please complete the following process:

1. Complete the **Time Zone Conflict Form** (<https://uoft.me/PSY-TimeZone>), and
2. Email the form to Keely Hicks (keely.hicks@utoronto.ca)

Deadline: You should report the conflict to Keely Hicks (keely.hicks@utoronto.ca) **at least two weeks (10 business days) before the date of the activity**, or as soon as possible, if it was not possible to identify the conflict earlier.

Accommodations for Students Registered with AccessAbility Services:

For missed **TERM TESTS** due to ACCESSABILITY REASONS:

- **Contact your AccessAbility consultant** and have them email Keely (keely.hicks@utoronto.ca) detailing accommodations required.

For missed **ASSIGNMENTS** due to ACCESSABILITY REASONS:

- If your desired accommodation is **within the scope** of your Accommodation Letter (ex. your letter includes “extensions of up to 7 days” and you need 3 days):
 1. Complete the **Request for Missed Term Work Accommodations Form** (<http://uoft.me/PSY-MTW>).
 2. Email the form and your **Accommodation Letter** to Keely Hicks (keely.hicks@utoronto.ca).
- If your desired accommodation is **outside the scope** of your Accommodation Letter (ex. your letter includes “extensions of up to 7 days” but you need more time than that):
 1. **Contact your AccessAbility consultant** and have them email Keely Hicks (keely.hicks@utoronto.ca) detailing the accommodations required.

After submitting your documentation:

Within approximately one to five business days, you will receive a response from your instructor detailing the accommodations to be made (if any).

You are responsible for checking your official U of T email and Quercus course announcements daily, as accommodations may be time-critical.

You should continue to work on your assignments to the best of your ability, as extension accommodations may be as short as one business day, depending on the nature of the illness/emergency.

If an accommodation has been granted but you are unable to meet the conditions of the accommodation (ex. you need a longer extension, or you missed a make-up test), you will need to repeat the missed term work procedure and submit additional forms to request further accommodation. Note that in the case of a missed make-up test, an opportunity to write a second make-up test may not be provided.

Completion of this form does not guarantee that accommodations will be made. The course instructor reserves the right to decide what accommodations (if any) will be made. Failure to adhere to any aspect of this policy may result in a denial of your request for accommodation.

Missed Accommodations

If an accommodation is granted but a continued illness/emergency prevents you from meeting the requirements of your accommodation, you must repeat the missed term work procedure to request additional accommodations.

(E.g.) If you miss a make-up midterm, you would need to submit another Request for Missed Term Work Accommodations form and declare your extended absence on ACORN.

Importance of Three Business Day window:

If you are unable to submit your documents within the three business day window, **you must email Keely (keely.hicks@utoronto.ca) within the three business day window** to explain the nature of the delay, and when you will be able to provide your documents. Exceptions to the documentation deadline will only be made under **exceptional circumstances**.

Questions?

If you have any questions about this Missed Term Work policy, please contact Keely Hicks (keely.hicks@utoronto.ca) **well before** the date of the test / assignment deadline to describe your circumstances and inquire about procedures.

XII) For Your Health

The Health and Wellness Centre (SL270, 416-287-7065) provides diagnostic, treatment and referral services for all illnesses ranging from the medical to psychological to health promotion. The professional staff of physicians, nurses and counselors provides personal advice and assistance with family issues, eating disorders, depression, stress, drug and alcohol abuse, relationship issues, a positive space for gender/sexuality issues, and more.

<http://www.utoronto.ca/wellness>