NROC61
LEARNING AND MOTIVATION
UNIVERSITY OF TORONTO SCARBOROUGH
WINTER 2019

INSTRUCTOR: **Prof. Rutsuko Ito**

OFFICE HOURS: **Mondays 12-2pm, SW627**

TAS: **Bilgehan Cavdaroglu**
Nicholas Guilbeault
Tanner McNamara
Dylan Patterson
Dylan Yeates

LECTURES: **Fridays 12-2pm, HW216**

TUTORIALS: **Students are required to attend weekly 1hr tutorials.**

COURSE WEBSITE RESOURCES: **Quercus & TopHat**

COURSE E-MAIL: **nroc61.utsc@gmail.com**

	Day/Time	Location	TA
TUT1	**Thur 2-3pm**	**BV264**	**Dylan Yeates**
TUT2	**Thur 10-11am**	**MW130**	**Tanner McNamara**
TUT3	**Thur 11-12pm**	**IC302**	**Nicholas Guilbeault**
TUT4	**Thur 12-1pm**	**BV359**	**Bilgehan Cavdaroglu**
TUT5	**Thur 1-2pm**	**BV260**	**Dylan Patterson**

Note about communication: *Please post content related questions to relevant blackboard discussion forum for the benefit of other students.* All other questions must be sent to nroc61.utsc@gmail.com, clearly indicating who the correspondence is addressed to. E.g., put the name of the TA in the subject line. Please note that emails pertaining to NROC61 sent to personal email accounts of Professor Ito's or the TAs will NOT be answered.

COURSE DESCRIPTION:

This course explores learning and motivation from a physiological, pharmacological and behavioral perspective, introducing the principal methods and logical inferences used in experiments that use laboratory animals. Thus, the course offers an in-depth exploration of the field of behavioural neuroscience. However, wherever possible, it is shown how these findings can be applied to humans, especially in a clinical setting. Topics covered under learning include: different types of associative learning and their neural basis with a focus on the notion that the mammalian brain is organized into multiple learning and memory systems. Topics covered under the category of motivation include the neural basis of eating, drinking and sleep and the neural correlates of reward and emotion.

Course objectives:

By the end of this course, a successful learner will be able to:

- Understand the core principles of associative learning and motivation from a physiological, pharmacological and behavioural perspective.
- Understand and evaluate different methodologies used in the field of behavioural neuroscience.
- Demonstrate proficiency in the use of search engines to search for articles of interest.
- Demonstrate the foundational skills necessary for understanding, interpreting, summarizing and evaluating primary scientific literature.
- Develop strategies to effectively design and deliver empirical research presentations to their peers.
- Work cooperatively in small groups, providing and receiving constructive peer feedback.

Course resources:

The lecture series will be loosely based on a book entitled 'Bear, Connors, & Paradiso. Neuroscience: Exploring the Brain (4th ed. Wolters Kluwer). However, there will be no assigned readings from this book. Instead, assigned readings will consist of a lecture handout written by myself and original empirical articles pertaining to the lecture topic. You will be assessed on the content of the handouts/papers.

Lecture slides and PDFs of papers for assigned reading will be posted on the course website ***by 9pm (or before)*** on the night before the lecture.

Tentative Course schedule:

Week	Dates	Topic
1	Jan 11	Course Introduction
2	Jan 18	Pavlovian Conditioning
3	Jan 25	Laws of association
4	Feb 1	Instrumental conditioning
5	Feb 8	Learning and Memory systems
6	**Feb 15**	**Midterm * in class (1hr 45min)**
	Feb 16-Feb 22	*Reading week – no class*

7	Mar 1	Central Reward Systems
8	Mar 8	Hypothalamus and Motivation 1
9	Mar 15	Hypothalamus and Motivation 2
10	Mar 22	Limbic system and emotions
11	Mar 29	Stress and arousal
12	Apr 5	Biological Clocks: Sleep and Wakefulness
	TBA	**Final exam (2hr 30min)****

I reserve the right to make alterations to the course content/schedule with advance notice.

* Content listed for Weeks 1 to 5 inclusive will be tested on the midterm.
** Content listed for Weeks 6 to 12 will be on the final exam.

Tentative tutorial schedule:

Week	Dates	Topic - content	Topic – skills	Assignment
1	Jan 10	**No tutorial**		
2	Jan 17	Introduction to assignments		
3	Jan 24	Pavlovian Conditioning	Using search engines – how to find relevant articles?	
4	Jan 31	Laws of association	Critically reading research articles	
5	Feb 7	Instrumental conditioning	Referencing and paraphrasing	
6	Feb 14	Learning and Memory systems	Giving journal club presentations - demo	***Annotated bibliography assignment due in 17th Feb 11.59pm***
	Feb 16	*Reading week* - ***No tutorial***		

	- Feb 22			
7	Feb 28	**Written assignment consultation – Optional**		
8	Mar 7	Central Reward systems	2 paper presentations	
9	Mar 14	Hypothalamus and Motivation	2 paper presentations	
10	Mar 21	**Written assignment consultation – Optional**		
11	Mar 28	Limbic system and emotions	2 paper presentations	***Written assignment due Mar 31st 11.59pm***
12	Apr 4	Stress and Arousal	2 paper presentations	

Evaluation

The tests will be based on the materials covered in the lectures and handouts.

1. Quiz (10% overall grade)

In class - In order to **facilitate active learning**, there will be **5 quiz questions** during each lecture (starting on Jan 18th), which you must participate in answering (**5% overall grade** for correctness and participation) using the TopHat* (see below for details) learning platform.

- If you miss a class for a valid reason (illness, other important events), then you will need to email the course email account within 24hrs of the lecture (nroc61.utsc@gmail.com) with appropriate documentation, and then I will assign the 'in class quiz' to you for that particular week, to be completed within one week on line (when the out of class quiz is due). Otherwise you will be awarded 0% for the week.

Out of class – You will be given the opportunity to complete **5 more quiz questions** out of class during a limited window of a week following the relevant lecture using the TopHat platform. **5% of the overall grade** will be awarded for correctness and participation.

These quizzes are designed to keep you on top of the material, and to prepare you for the exams.

TOPHAT

For the second time in the history of this course (I've taught this course since 2012), we will be using the Top Hat (www.tophat.com) classroom response system in class and out of class for exam practice and review. You will be able to submit answers to in-class and out of class review questions using Apple or Android smartphones and tablets, laptops, or through text message.
You can visit the Top Hat Overview (https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system.

Please register on TOPHAT before the second lecture by simply visiting the course website:
Unique Course URL: **https://app.tophat.com/e/975838**
And entering the following codes:
Main Lecture Course for in class quiz
Leaning and Motivation – Winter 2019 Join Code: **975838**
Tutorial for out of class quiz and exam practice questions
Tutorial 1 Join Code: 860985
Tutorial 2 Join Code: 063314
Tutorial 3 Join Code: 535333
Tutorial 4 Join Code: 186079
Tutorial 5 Join Code: 347622

Top Hat will require a paid subscription, and a full breakdown of all subscription options available can be found here: www.tophat.com/pricing. *I recommend the $26 option, as TOPHAT has not yet been rolled out in many other C level courses at UTSC.* Please consider this fee as an investment in an enhanced learning experience, which will hopefully translate into better exam performance! Also remember that **you do NOT need to purchase a coursepack or textbook for this course** as I have written a course text for you, so I am saving you money in other ways!

Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491.

2. Midterm Test (25% overall grade)

This test will take place on **Friday 15th February in class**, and will consist of **multiple-choice questions** and **short answer questions** on the material covered in **Lectures 1-5**.

Many of the questions will require the **a*pplication*** of the knowledge gained in the first 5 weeks of the lecture series. Thus, rote memorization of lectures and readings will not guarantee you a high mark.

3. Final exam (30% overall grade)

This test will consist of **multiple-choice questions** and **short and long answer questions** on the material covered in **Lectures 6-12**:

4. Tutorial grade (35% overall grade)

The tutorials are primarily intended to familiarize students with the general knowledge base of neuroscience, namely the published literature.
The format of each tutorial will be:

- 20 min Discussion/Recap/Questions on the Lecture material
- 30min on Skill based topic (Weeks 2-5)
- OR
- 2 x 15min Oral Presentations on pre-assigned primary articles (Weeks 7-10)

a. **Class presentation of primary article –10 %**

Eight empirical articles will be assigned for **tutorials 7,8,10 & 11**, **to be presented by 3 students per article.** Each presentation will be 15 minutes in length – 12 minutes to present key details of the article (Introduction/Rationale of study/Methods/Results/Discussion/Caveats & Future directions) and ~3 minutes to answer questions about the article from the class. *The presentation (12min) will be timed, and any content presented beyond this time will not be considered for marking. Therefore, it is important that you get your timings right!*

In the first few tutorials, please identify your presentation group, and sign up for the week that you would like to present. If you do not sign up by the end of the third week, the TA will assign partners on your behalf.

A demonstration of what is expected of you will be provided by your TA in the 5th tutorial. You are required to discuss the paper and present the paper together as a team and will be expected to make equal contribution to both the preparation and presentation. Please ensure an equal division of labour for the presentation between the three of you.

At the end, each of you must present a slide answering these questions: 1) Why is the study important? 2) What are the limitations and critique/future directions? You must come up with your own thoughts on these.

Marks will be awarded **individually** for clarity of presentation, effective use of visual aids/handouts, and the ability to answer questions about the research. There will also be a mark for evidence of **co-operation and cohesiveness** between the 3 of you. You will also be given the opportunity to make comments on your partner (in confidence), should you feel that there was an unfair division of labour.

On the day of your presentation, please come prepared with a hardcopy of your PowerPoint presentation, or send the TA an electronic copy of your presentation. Your TA will indicate their preference.

Please note that the content of the articles cannot be discussed with your TAs or myself during tutorials or office hours.

b. Current advances written assignment – 20%

In this assignment, you will be writing an opinion piece on how **2 empirical articles of your choice published in the last three years (2016-2018)** advances our **understanding of the neural basis of a specific process of learning or motivation.** This assignment is designed for you to make use of the internet referencing services such as *pubmed* (http://www.ncbi.nlm.nih.gov/pubmed), or *google scholar (*https://scholar.google.ca) in selecting your 2 current empirical articles. **The list of topics will be released after your first tutorial.**

The articles must describe *rodent work in* the field of systems/circuit neuroscience (but not molecular or genetics). The assignment is divided up into two parts, to help guide you in the process of writing.

- **Annotated bibliography** (5%): You will be asked to generate an abstract list of **2 empirical articles** (*not reviews*) from the last 3 years (2016-2018) that, in your opinion, have provided novel insight into the neural basis of learning/motivation. This document must have a title of your chosen topic, followed by a description of what we already know of the topic. You will then list your 2 articles, each of which should include the title of the paper, all authors' names, year of publication, journal, journal volume, page numbers, followed by the original abstract from the paper, and a short paragraph summarizing the findings of the papers **in your own words**, and how it advances knowledge. The reference list must be uploaded to your **Tutorial Quercus site** on **Sunday 17th February 2019, 11.59pm**.

- **Paper** (15%): The paper should be typed double spaced, 12pt Times New Roman font, and should be a maximum of **5 pages** in length. In addition to these pages, you must include a cover page (title,

candidate name and number of word count), and a reference page. Thus, your final paper will be a maximum of 7 pages in length. **APA format is required for the submission of this paper.** Your paper is due on **31st March 2019 on the Tutorial site on Quercus.**

Please note that all assignments submitted on Quercus will be assessed by the **Turnitin program**, which is a tool that assists in detecting textual similarities between compared works i.e., it is an electronic resource that assists in the detection and deterrence of plagiarism.

c. Tutorial attendance and participation – 5 %

Students are expected to attend and participate in the **9 mandatory tutorials**. **5% of the overall mark** will be awarded for weekly attendance and active participation in the tutorials. The breakdown of the grade will be:

1) **Attendance**
2) **Generating and asking 'Discussant' questions** for ONE research article being presented by another group. You should read the article, and prepare at least **2 questions** to ask the students during 'discussion/question time'. 'This will ensure that everyone will have an opportunity to participate, and be fairly evaluated for participation. *So that the TAs can assess the quality of the questions, you must email the questions to them by* ***11.59pm on the Wednesday night*** *before the presentation.*
3) **Peer evaluation -** you will be filling in a peer evaluation form for ONE presentation (separate to the one for which you are a discussant), in which you will give peer feedback and a grade for the presentation. *Please hand the form in to your TA at the end of the tutorial*.

Course Policies:

Missed Term Work due to Medical Illness or Other Emergency:

All students citing a documented reason for missed term work must submit their request for accommodations **within three (3) business days** of the deadline for the missed work.

Students must submit **BOTH** of the following:

(1.) A completed **Request for Missed Term Work Accommodations form** (http://uoft.me/PSY-MTW), and
(2.) **Appropriate documentation** to verify your illness or emergency, as described below.

Appropriate documentation:

For missed **TERM TESTS** due to **ILLNESS**:

- Submit the Request for Missed Term Work Accommodations form (http://uoft.me/PSY-MTW), along with an **original** copy of the official UTSC Verification of Illness Form (uoft.me/UTSC-Verification-Of-Illness-Form) or an **original** copy of the record of visitation to a hospital emergency room. Forms are to be completed in full, clearly indicating the start date, anticipated end date, and severity of illness. The physician's registration number and business stamp are required.

For missed **ASSIGNMENTS** due to **ILLNESS**:

- Submit the Request for Missed Term Work Accommodations form (http://uoft.me/PSY-MTW), along with a **hardcopy** of the Self-Declaration of Student Illness Form (uoft.me/PSY-self-declare-form).

For missed term tests or assignments in **OTHER CIRCUMSTANCES**:

Submit the Request for Missed Term Work Accommodations form (http://uoft.me/PSY-MTW), along with:

- In the case of a **death of a family member or friend**, please provide a copy of a death certificate.
- In the case of a **disability-related concern**, if your desired accommodation is within the scope of your Accommodation Letter, please attach a copy of your letter. If your desired accommodation is outside the scope of your Accommodation Letter (ex. if your letter says "extensions of up to 7 days" but you need more time than that) you will need to meet with your consultant at AccessAbility Services and have them email Keely Hicks (keely.hicks@utoronto.ca) detailing the accommodations required.
- For U of T Varsity **athletic commitments**, an email from your coach or varsity administrator should be sent directly to Keely Hicks (keely.hicks@utoronto.ca) **well in advance** of the missed work, detailing the dates and nature of the commitment.
- For **religious accommodations**, please email (keely.hicks@utoronto.ca) **well in advance** of the missed work.

Documents covering the following situations are NOT acceptable: medical prescriptions, personal travel, weddings/personal/work commitments.

Procedure:

Submit your (1.) request form and (2.) medical/self-declaration/other documents in person **WITHIN 3 BUSINESS DAYS** of the missed term test or assignment.

Submit to: Keely Hicks, Room SW420B, Monday – Friday, 9 AM – 4 PM

Exceptions to the documentation deadline will only be made under exceptional circumstances. If you are unable to meet this deadline, you must email Keely Hicks (keely.hicks@utoronto.ca) **within the three business day window** to explain when you will be able to bring your documents in person. Attach scans of your documentation.

Within approximately one week, you will receive an email 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.**

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.

Instructors cannot accept term work after April 12, 2019. Beyond this date, you would need to file a petition with the Registrar's Office to have your term work accepted (https://www.utsc.utoronto.ca/registrar/term-work).

Note that this policy applies only to missed assignments and term tests. Missed final exams are handled by the Registrar's Office (http://www.utsc.utoronto.ca/registrar/missing-examination).

Missed presentation

A grade of zero will be given if you do not give your presentation on the assigned date. Missed presentations will only be rescheduled provided an official notification comes our way from Keely Hicks.

You should be prepared to give your presentation at any tutorial following the missed date. Your TA will try to give you advance notice but this may not be possible.

Missed exams

You are expected to make every effort to take required mid-terms/final exam. Absence from a mid-term/exam will only be granted for genuine, legitimate reasons, including a documented family emergency, or a documented severe illness. This does not include reasons of scheduling conflict. **There will be one make-up test for the midterm for those who can supply legitimate documents via the official route described above.** ***Exams that are missed without a genuine, legitimate reason will receive a 0% mark.***

Late Assignments

All late assignments will be accepted with a penalty of **10% per day**, up until the third day after the assignment is due in. All assignments are due by 11.59pm (midnight) on the due date.

Contesting a grade

All requests for a re-grade must be submitted **in writing** within one week of the day the grade is received. Only requests that include adequate written justification of an error in the original grading will be considered. *A legitimate request will result in the entire exam or assignment being re-graded. Your overall grade may be raised, lowered, or it may stay the same.* If there has been an error in our arithmetic, please let us know and we will immediately recalculate your grade (no written request necessary). **Arbitrary requests for grade increases will not be entertained (e.g., "I need to get into grad school, so could you please give me a higher grade?").**

Scheduling conflict

A web option will NOT be offered for this course, so it is your responsibility to ensure that you are able to attend all the lectures. Given the nature of the material and course, attendance is critical to your success. If you have an ongoing conflict with lecture or tutorial time, you should strongly consider dropping the course or adjusting your schedule to allow you to attend. Accommodations are not possible for scheduling conflicts.

Video and Auditory Recording

For reasons of privacy as well as protection of copyright, unauthorized video or audio recording in classrooms is prohibited. This is outlined in the Provost's guidelines on *Appropriate Use of Information and Communication Technology*. Note, however, that these guidelines include the provision that students may obtain consent to record lectures and, "in the case of private use by students with disabilities, the instructor's consent must not be unreasonably withheld."

Copyright of lecture material

As protection of copyright, unauthorized copying, use, or uploading of any of the lecture slides, lecture handouts produced by Professor Ito is strictly prohibited.

Accessibility

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 Access*Ability* Services Office as soon as possible. I will work with you and Access*Ability* Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC Access*Ability* Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. Contact at (416) 287-7560 or ability@utsc.utoronto.ca.

Academic Integrity

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:

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/).