

# PSY290H5F – Introduction to Neuroscience

Tuesday and Thursday 9:00am - 12:00pm

DV 2082 (Davis Building) IN-PERSON

## Course Delivery

- In-person – Returning to Campus Summer 2022
- Learn Anywhere Guide for Students  
<https://library.utm.utoronto.ca/students/quercus/learn-anywhere>  
University of Toronto tech requirements for online learning

## Contact Information

Dr. Brett Beston

email: [brett.beston@utoronto.ca](mailto:brett.beston@utoronto.ca)

### Course Content Questions?

Please use **Quercus discussion forums** to ask **content related questions** so we can build a common resource that all can benefit from.

### Other Questions?

Please see me after class and I'd be happy to talk!

-or-

Please email me to schedule an alternate time if needed.

Teaching Assistants:

**Harashdeep Deol**

[harashdeep.deol@mail.utoronto.ca](mailto:harashdeep.deol@mail.utoronto.ca)

**Thanh Phung**

[thanh.phung@mail.utoronto.ca](mailto:thanh.phung@mail.utoronto.ca)

## Course Description

The human brain is made up of billions of cells and trillions of connections that give rise to our ability to perceive, act, think, and learn. Neuroscience, the scientific exploration of the brain, is beginning to unravel how this amazing structure works. In this course, you will learn the fundamental anatomical organization and physiological properties of the brain. You will develop a greater understanding of the organization of major features of the brain, how neurons communicate, perceive, and learn.

## LEARNING OBJECTIVES

*By the end of this course, students should be able to;*

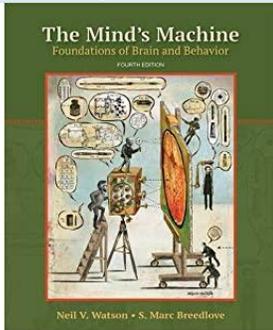
- **Identify** and **distinguish** anatomical, cellular, and functional features of the brain.
- **Explain** how neurons propagate signals and communicate to other neurons.
- **Describe** the process of development
- **Explain** the neurobiological basis of learning and memory.
- **Analyze** how neuroscience findings are interpreted and communicated to broad audiences.
- **Connect** foundational principles of neuroscience to modern-day, real-world, applications.

## CLASS FORMAT

Classes will consist of one 3-hour lecture each week. Please plan to attend lectures. Lecture slides will be posted on Quercus before class. Recordings of may be posted after lecture. **PLEASE NOTE:**

- *Simply reviewing the posted lecture notes **will not** provide you with all the details discussed in lecture, and more importantly, a contextual framework of the material that we are learning about.*
- *Although lectures will be recorded for your benefit, **do not** rely upon recordings as your main point of contact with the course, or to supplement your attendance. In some unfortunate instances, lecture recordings will fail due to software or user error. As your instructor, I simply cannot guarantee that lecture recordings will be provided each week.*

## Reading Material



**The Mind's Machine:** Foundations of Brain and Behavior by Watson & Breedlove, 4th edition  
[UTM bookstore link to text](#)

**PLEASE NOTE: THE MID-TERM AND EXAM WILL INCLUDE MATERIAL PRESENTED FROM BOTH LECTURE AND ASSIGNED READINGS.**

## Course Evaluation

### Tests and Exams (96%)

Term Test 1 - 28%

Term Test 2 - 28%

Final Exam - 40%

- Dates of term tests are listed in outline (end of syllabus). All tests will take place during scheduled lecture times and **start at 9am and end at 11am** (2 hours).
- Tests are scheduled to take place **in-person** in our assigned classroom on the dates scheduled (see course outline on last page).
- **Term tests and final exam** will be based on the material from lectures and assigned readings. The term tests and the final exam will consist of multiple-choice questions, shorter and longer questions as well as diagrams requiring you to label parts of the brain (based on lectures and textbook). The shorter and longer questions will require students to recite information and integrate knowledge analytically.
- Although the **term tests** will not be explicitly cumulative (i.e., they will specifically ask questions from chapters covered during that section of the test (see course calendar), term test 2 will require students to have a foundation of knowledge from the first portion of the course.
- The exam will be scheduled by the registrar. The exam will be **CUMULATIVE** and include content from the entire course.

## **Course 'Engagement' Credit (CEC, up to a MAXIMUM 4%).**

Students will receive credit for participating in course related activities. The list below outlines different ways that YOU can participate to earn course engagement credit. **Students select which activities they choose to contribute to (or not) up to a maximum of 4% towards your final grade!**

**\*Course Engagement Credit (CEC) must be completed by the last day of scheduled classes.\***

### **Ways to Participate**

1. **(CEC #1) Participate in our weekly "IN-CLASS" questions = 4%**

*Please note: A purchase of Top Hat software that is included with the text is required to participate in these activities.*

Answer questions during class and earn credit for doing so! Credit is assigned for participation, not "correct-ness" of each response. There will be eleven classes with Top Hat activities over the course of the term. Credit will be assigned based attendance and participation (**NOT** the number of questions in each class, or by the 'correctness' of responses provided. You can earn participation credit by responding to at least one question per class.). Students must be in attendance during the lecture to participate in Top Hat activities.

- Participation in 7-9 classes will be given 4% credit.
- Participation in 5-6 classes will be given 3% credit.
- Participation in 4 classes will be given 2% credit.
- Participation in 3 or fewer classes will not receive in-class participation credit.

To join TopHat, visit the following page: <https://app.tophat.com/register/student/Psy290> course code to join: **829916**

2. **(CEC#2) Help-a-Peer (1% each, to a maximum of 4% over the term).**

Students who provide an informative, original answer on the Quercus discussion forum in response to another student's question regarding course material will earn credit for their response. An informative answer is one that correctly and articulately explains a conceptually challenging topic. The answer is original if no similar answer has been provided. Original and informative responses to question will receive 1% toward "Help-a-Peer" CEC.

3. **(CEC#3) Neuron participation 'easter egg' (1%)**

Thank you for reviewing the course syllabus! To receive an additional 1% CEC towards your lowest test score, please email me one (1) of Santiago Ramón y Cajal's drawings of neurons by the start of third lecture. In your reply (and to earn 1% credit), please name and describe the function of at least one kind of neuron depicted in the image.

You can participate in any combination of CEC activities over the term. For example, consider the following two different approaches that students could take:

**Student 'A'** could participate by (1) answering four questions on our discussion forums over the course of the term (that's 4% CEC right there!). This example highlights that a student potentially only needs to participate in two activities to earn the full 4% credit.

Alternatively, **Student 'B'** might decide to participate in Top Hat activities over 4 classes (2% CEC), answer one discussion question on Quercus (1% CEC) and participate in the easter egg activity. In this case, 2% + 1% + 1% = 4% CEC. Although the approach taken by student 'B' is a little different, she/he would still earn the full 4% CEC credit at the end of term. This example highlights that any combination of activities can contribute to earning the full 4% credit.

## Course Webpage

The website associated with this course is accessible via <http://q.utoronto.ca>

**Note:** You don't need to create a new login for Canvas; it already knows who you are. You just need your UTORid and password. This is the same login that gets you onto the wireless network with your laptop, and the same one that you use to check your email. If you're confused about your UTORid or don't remember your password, go to: <https://www.utorid.utoronto.ca/>

In order to access course material, monitor course information, and view your grades you must log into Canvas. If you have any general questions regarding Canvas, please visit the following help site: <https://library.utm.utoronto.ca/faculty/canvas>

## IMPORTANT COURSE POLICIES \*\*PLEASE READ\*\*

### Missed Test Special Consideration Request Process

Students who miss a test due to circumstances beyond their control (e.g. illness or an accident) can request that the Department grant them special consideration. Students must present their case to the Department (NOT the Instructor) by submitting a request via the online Special Consideration Request form at: <https://utmapp.utm.utoronto.ca/SpecialRequest>.

**Important note:** Once the test/exam is available online or in-person and you're unable to write or have an approved request to miss, **DO NOT** at any point attempt to access/write the test/exam. If at any time you access the test/exam or sit down to write, you will **NOT** be able to submit a special consideration and/or your request will be refused.

**If your request is approved by the department, the weight of the missed test will be redistributed to the final exam.**

### Extension of Time Special Consideration Request Process

Students who seek to be granted more time to complete their term work beyond the due date without penalty, owing to circumstances beyond their control (e.g., illness, or an accident), must do so by submitting a request **directly to the Instructor** for the period up to and including the last day of the term. The decision as to whether or not to apply a penalty for the specified period rests with the Instructor.

Students who seek to be granted more time to complete term work beyond the last day of the term must submit their request directly to the Department. This request covers the period following the last day of classes and ends the last day of the exam period. This is done by submitting a request via the online Special Consideration Request form at <https://utmapp.utm.utoronto.ca/SpecialRequest>. You are advised to seek advising by the departmental Undergraduate Counsellor prior to the deadline.

### Supporting Documentation

The University is temporarily suspending the need for a doctor's note or medical certificate for any absence from academic participation. However, you are required to use the Absence Declaration tool on ACORN found in the Profile and Settings menu to formally declare an absence from academic participation. The tool is to be used if you require consideration for missed academic work based on the procedures specific to our campus/department.

### Missed Final Exam or Extension of Time beyond exam period

Missed final exams or for extensions of time beyond the examination period you must submit a petition through the Office of the Registrar. <http://www.utm.utoronto.ca/registrar/current-students/petitions> and follow their procedures.

### Penalties for Lateness

A penalty of 10% per calendar day (i.e., including week-ends and holidays, during which students are not able to submit term work) up to and including the last day of classes, will be applied by the Instructor. After the last day of classes, the penalty of 10% per calendar day will be applied by the Undergraduate Counsellor on behalf of the Department. No penalty will be assigned if request for special consideration, described above, was successful.

## **Academic Guidelines**

It is your responsibility to ensure that you have met all prerequisites listed in the UTM Calendar for this course. If you lack any prerequisites you WILL BE REMOVED from the course up until the last day to add a course. Further information about academic regulations, course withdrawal dates and credits can be found in the University of Toronto Mississauga Calendar at: <http://www.erin.utoronto.ca/regcal/>.

You are encouraged to read this material. If you run into trouble and need advice about studying, preparing for exams, note taking or time management, free workshops and advice are available from the Robert Gillespie Academic Skills Centre at 905-828-5406.

## **AccessAbility Services**

The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs. Students requiring academic accommodations for learning, physical, sensory, or mental health disabilities or medical conditions should contact the AccessAbility Office (2037B Davis Building), 905-828-3847. <http://www.utm.utoronto.ca/accessability/>

## **Privacy and Copyright Disclaimer**

### ***Notice of video recording and sharing (Download and re-use prohibited) if applicable***

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session. Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation, and are protected by copyright. Do not download, copy, or share any course or student materials or videos without the explicit permission of the instructor. For questions about recording and use of videos in which you appear please contact your instructor.

Lectures and course materials prepared by the instructor are considered by the University to be an instructor's intellectual property covered by the Copyright Act, RSC 1985, c C-42. Course materials such as PowerPoint slides and lecture recordings are made available to you for your own study purposes. These materials cannot be shared outside of the class or "published" in any way. Posting recordings or slides to other websites without the express permission of the instructor will constitute copyright infringement.

## **Academic Honesty and Plagiarism**

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 Mississauga is a strong signal of each student's individual academic achievement. As a result, UTM treats cases of cheating and plagiarism very seriously.

The University of Toronto's Code of Behaviour on Academic Matters outlines behaviours that constitute academic dishonesty and the process for addressing academic offences. Potential offences include, but are not limited to:

### **In papers and assignments:**

1. Using someone else's ideas or words without appropriate acknowledgement.
2. Submitting your own work in more than one course without the permission of the instructor.
3. Making up sources or facts.
4. Obtaining or providing unauthorized assistance on any assignment.

### **On tests and exams:**

1. Using or possessing unauthorized aids.
2. Looking at someone else's answers during an exam or test.
3. Misrepresenting your identity.

### **In academic work:**

1. Falsifying institutional documents or grades.
2. Falsifying or altering any documentation required, including (but not limited to) doctor's notes.

With regard to remote learning and online courses, UTM wishes to remind students that they are expected to adhere to **the Code of Behaviour on Academic Matters** regardless of the course delivery method. By offering students the opportunity to learn remotely, UTM expects that students will maintain the same academic honesty and integrity that they would in a classroom setting. Potential academic offences in a digital context include, but are not limited to:

#### Remote assessments:

1. Accessing unauthorized resources (search engines, chat rooms, Reddit, etc.) for assessments.
2. Using technological aids (e.g. software) beyond what is listed as permitted in an assessment.
3. Posting test, essay, or exam questions to message boards or social media.
4. Creating, accessing, and sharing assessment questions and answers in virtual “course groups.”
5. Working collaboratively, in-person or online, with others on assessments that are expected to be completed individually.

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.

#### Equity Statement

The University of Toronto is committed to equity and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect. As a course instructor, I will neither condone nor tolerate behaviour that undermines the dignity or self-esteem of any individual in this course and wish to be alerted to any attempt to create an intimidating or hostile environment. It is our collective responsibility to create a space that is inclusive and welcomes discussion. Discrimination, harassment and hate speech will not be tolerated. If you have any questions, comments, or concerns you may contact the UTM Equity and Diversity officer at [edo.utm@utoronto.ca](mailto:edo.utm@utoronto.ca) or the University of Toronto Mississauga Students' Union Vice President Equity at [vpequity@utmsu.ca](mailto:vpequity@utmsu.ca).

#### Academic Rights

You, as a student at UTM, have the right to:

- Receive a syllabus by the first day of class.
- Rely upon a syllabus once a course is started. An instructor may only change marks' assignments by following the University Assessment and Grading Practices Policy provision 1.3.
- Refuse to use turnitin.com (you must be offered an alternative form of submission).
- Have access to your instructor for consultation during a course or follow up with the department chair if the instructor is unavailable.
- Ask the person who marked your term work for a re-evaluation if you feel it was not fairly graded. You have up to one month from the date of return of the item to inquire about the mark. If you are not satisfied with a re-evaluation, you may appeal to the instructor in charge of the course if the instructor did not mark the work. If your work is remarked, you must accept the resulting mark. You may only appeal a mark beyond the instructor if the term work was worth at least 20% of the course mark.
- Receive at least one significant mark (15% for H courses, 25% for Y courses) before the last day you can drop a course for H courses, and the last day of classes in the first week of January for Y courses taught in the Fall/Winter terms.
- Submit handwritten essays so long as they are neatly written.
- Have no assignment worth 100% of your final grade.
- Not have a term test worth more than 25% in the last two weeks of class.
- Retain intellectual property rights to your research.
- Receive all your assignments once graded.
- View your final exams. To see a final exam, you must submit an online Exam Reproduction Request within 6 months of the exam. There is a small non-refundable fee.
- Privacy of your final grades.
- Arrange for representation from Downtown Legal Services (DLS), a representative from the UTM Students' Union (UTMSU), and/or other forms of support if you are charged with an academic offence.

## Course Outline

| Class        | Topic   | Notes   |
|--------------|---|---|
| 1 (May 10)   | Introduction to Brain and Behaviour                       | Introduction<br>Pg. 2-10                          |
| 2 (May 12)   | Structure and Function: The Anatomy of the Nervous System | Chapter 1<br>Pg. 30-41, 43-47                     |
| 3 (May 17)   | Micro Anatomy and Neural Transmission                     | Chapter 1 and 2<br>Pg. 18-25, 42-43, 54-59, 74-75 |
| 4 (May 19)   | <b>Term Test 1</b>  |   |
| 5 (May 24)   | Graded Potentials and Action Potentials                   | Chapter 3<br>Pg. 60-70                            |
| 6 (May 26)   | The Chemistry of Behaviour                                | Chapter 2 and 3 Pg.<br>71 – 75, 83-101            |
| 7 (May 31)   | Sensory Systems   | Chapter 5<br>Pg. 142-150                          |
| 8 (June 2)   | <b>Term Test 2</b>  |   |
| 9 (June 7)   | Neurodevelopment  | Chapter 4<br>Pg. 121-140                          |
| 10 (June 9)  | Learning  | Chapter 13<br>Pg. 421-431                         |
| 11 (June 14) | Memory  | Chapter 13<br>Pg. 406-420                         |
|              | <b>Final Exam (scheduled by Registrar)</b>                |   |