

# PSYB03: Introduction to Computers in Psychological Research

University of Toronto, Scarborough, Fall 2020

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Office Hours: Please see “Announcements” on Quercus for this information.

Prior to contacting the instructor or the TA please read the **e-mail policy** (p. 3) and note that we will not respond to Quercus messages.

## I. Your instructor



Dr. Nestor is an Associate Professor of Cognitive Neuroscience. He received his Ph.D. in Cognitive Science from Brown University and completed his postdoctoral training at Carnegie Mellon University. His research and teaching interests revolve around the neuroscience of visual cognition, computational modeling, neuroimaging methodology and neurotechnology.

## II. Course description, pre-requisites and learning goals

The course aims to shape critical thinking in approaching scientific research with the aid of modern-day computer technologies while appreciating their extensive range of strengths along with the constraints that they pose. The course aims to provide students with fundamental knowledge and concrete skills regarding computer-based implementations of experimental testing, data analysis and result visualization. More generally, the course encourages and allows students to conceptualize and evaluate experimental research from a practical computational perspective.

Prerequisites: PSYA01 and PSYA02

Corequisite: PSYB07 or STAB22

The goals of the course target a broad set of skills related to:

(i) understanding and demonstrating procedural abstraction when writing / evaluating computer code (identify and define a problem, design an algorithmic approach to address the problem, critically evaluate the success of a solution);

(ii) using variables/values/types, assignment, and control flow (conditionals / loops / error handling) as well as recognizing the importance of memory considerations and file management in a programming environment;

(iii) demonstrating good commenting and documentation practices when writing computer code;

(iv) generating graphical data and exporting this for use in reports, presentations;

(v) recognizing and articulating the wide scope of computer use in psychology and neuroscience.

The course will set the ground for developing the mastery of programming methods and techniques relevant to empirical and computational research. More generally, the course will be instrumental in developing critical and creative thinking skills as involved in the implementation and the evaluation of alternative solutions to a range of problems relevant for psychological research. Last, the course aims to sharpen quantitative reasoning skills related to the implementation of specific algorithms / computations as well as to improve on graphical communication skills as involved in the plotting of data sets.

The topics covered will include basic calculations, data precision, control flow, functions, basic image processing, statistical testing, graphical representation of data structure and result interpretation. Computer implementations involve the Matlab computing environment with the addition of specific toolboxes (e.g., Statistics, Image processing).

### III. Course resources

Course readings: Links to readings, resources, and software (provided through Quercus).

The student version of Matlab (ver 9.0, 2016 or higher) is recommended.

Online resources: Quercus

### IV. Course grading

#### **Assignments (28%)**

Activities are small exercises that are assigned multiple times throughout the term as a way for you to demonstrate your knowledge of course content. They may require you to write code or provide short answers to questions. This component of the grade will be based on the best 7 (out of 8) assignments. [If you only submit 7 assignments, the grade will be the average of those 7 assignments.]

#### **Midterm exam (36%)**

The Midterm Examination will cover materials from weeks 1-5 and 7 (see course schedule on the last page of this syllabus). Term tests dates and times are scheduled by the Office of the Registrar.

#### **Final exam (36%)**

The exam will cover material from all lectures, labs, and activities. Final exam dates and times are scheduled by the Office of the Registrar

All exams will be conducted in Quercus. Administrative details will be provided prior to the exams. To give you an opportunity to prepare for the examinations, practice questions will be made available for you prior to the midterm and the final exam.

**While exams will essentially be “open notes and open book,” you are absolutely NOT permitted to work with or obtain any pertinent information from any other person – a student in this course or anyone otherwise – during examinations!**

### V. Course policies

#### **Lecture slides**

For your convenience, lecture slides and associated materials will be posted at the beginning of each week (i.e., by the first day of classes of each week).

You should know that lecture slides are not a suitable substitute for watching and understanding lecture. Lecture slides are not exhaustive and we will regularly cover important material that extends beyond them during lecture. You are responsible for this material with respect to testing.

Instructional materials are only for the purpose of learning in this course and must not be distributed or used for any other reason whatsoever.

### **Late assignments**

A penalty of 10% will be deducted for each 24-hour period that an assignment is late. Extensions will only be granted with proper documentation (see Missed term work below). Please note that Instructors cannot accept term work any later than five business days after the last day of class.

### **E-mail policy**

The email subject should include the course name and nature of the inquiry (i.e., “PSYB03: Question about loops”). Emails should be sent from your UofT email account. The start of your email should include your full name and student ID number so that we know who you are. An email should contain no more than one question and you should try to explain your current understanding of the concept in the email (which will be affirmed or corrected).

In most cases, e-mails will be answered within 48 hours of receipt (not including weekends).

If you are not used to writing emails in an academic context, I encourage you to review this online resource so that you adopt proper email etiquette now and in the future: <<https://tinyurl.com/kysxwtx>>

### **Office hours**

You should consider visiting Prof. Nestor’s office hours if you would like to (1) discuss course content, (2) if you have an issue with course performance or progress, (3) contest a question on a midterm, or (4) you would like to discuss the field of psychology/neuroscience and how to get more involved. With respect to Point 3, contesting a question must occur within two weeks of releasing the exam marks or it will not be considered.

### **Contesting a grade**

All requests for a re-grade must be submitted in writing within two weeks of the day that the grade is posted. Only requests based on adequate written justification regarding an error in the original grading will be considered. Arbitrary requests for grade increases (e.g., ‘I need to get into grad school’) will be dismissed.

Please note that a legitimate request will entail a re-grading of the entire assignment. Hence, your grade may be raised, lowered or left intact.

### **Syllabus changes**

There may be minor changes to the syllabus during the term. You will be notified of these changes ASAP and no changes will be instituted that dramatically affect your ability to properly prepare for an examination (e.g., reading an extra chapter the week before the midterm).

### **Taking an examination**

All examinations will be held online using Quercus, and the dates/times of these exams will be set by the Office of the Registrar.

### **Notice of video recording and sharing (Download permissible; re-use prohibited)**

This course (potentially 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. In this course, you are permitted to download session videos and materials for your own academic use, but **you should not copy, share, or use them for any other purpose without the explicit permission of the instructor.**

### **AccessAbility**

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 as soon as possible.

AccessAbility Services staff (located in Rm SW302, Science Wing) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations [416-287-7560](tel:416-287-7560) or email [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca). The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

### **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/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun01\\_1995.pdf](http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun01_1995.pdf)) 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:

- Receiving aid of any form from another person in the context of an examination
- Using or possessing unauthorized aids;
- Looking at someone else's answers during an exam or test;
- Misrepresenting your identity; and
- When you knew or ought to have known you were doing it.

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; and
- When you knew or ought to have known you were doing so.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If students have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, they are expected to seek out additional information on academic integrity from their instructors or from other institutional resources.

Note that you may see advertisements for services offering grammar help, essay editing and proof-reading. Be very careful. If these services take a draft of your work and significantly change the content and/or language, you may be committing an academic offence (unauthorized assistance) under the *Code of Behaviour on Academic Matters*.

It is much better and safer to take your draft to the Writing Centre as early as you can. They will give you guidance you can trust. Students for whom English is not their first language should go to the English Language Development Centre.

If you decide to use these services in spite of this caution, you must keep a draft of your work and any notes you made before you get help and be prepared to give it to your instructor on request.

## VI. Course policies on time zone conflicts and missed term work

### **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, you may use the following form to request special arrangements. Note that the form is only for term work. [Final exam conflicts](#) are handled by the Registrar's Office.

The form must be submitted **at least ten (10) business days before the activity.**

Form: <https://uoft.me/PSY-TimeZone>

### **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.

**Submit via email to:** Keely Hicks, Departmental Assistant, [keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)

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

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

#### **Appropriate documentation:**

For missed **ASSIGNMENTS** or **TERM TESTS** due to **FLU-LIKE SYMPTOMS** or **SELF-ISOLATION REQUIREMENTS:**

- Email the Request for Missed Term Work Accommodations form ([uoft.me/PSY-MTW](http://uoft.me/PSY-MTW)) to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), and
- **Declare** your absence on [ACORN](#) (Profile & Settings > Absence Declaration)

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

- Email the Request for Missed Term Work Accommodations form ([uoft.me/PSY-MTW](http://uoft.me/PSY-MTW)) to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), along with the Self-Declaration of Student Illness Form ([uoft.me/PSY-self-declare-form](http://uoft.me/PSY-self-declare-form)).

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

- Email the Request for Missed Term Work Accommodations form ([uoft.me/PSY-MTW](http://uoft.me/PSY-MTW)) to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), along with a scan/photo of the **original** copy of the official UTSC

Verification of Illness Form ([uoft.me/UTSC-Verification-Of-Illness-Form](http://uoft.me/UTSC-Verification-Of-Illness-Form)) or an **original** copy of the record of visitation to a hospital ER.

- Forms are to be completed in full, clearly indicating the start date, anticipated end date, and severity of illness. The physician's registration # and business stamp are required.
- *Note: If an end date of "ongoing" is specified, the medical note will be assumed to cover a period of **two weeks**. If no end date / an "unknown" end date is specified, the note will be assumed to cover a period of **three business days** (starting from illness start date.)*

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

- Meet with your **AccessAbility consultant** and have them email Keely ([keely.hicks@utoronto.ca](mailto: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 1-7 more days), email the Request for Missed Term Work Accommodations form ([uoft.me/PSY-MTW](http://uoft.me/PSY-MTW)) to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), and attach a **copy of your letter**. Specify how many days extension you are requesting in your email.
- 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) you will need to meet with your **AccessAbility consultant** and have them email Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)) detailing the accommodations required.

For missed **ASSIGNMENTS or TERM TESTS** in **OTHER CIRCUMSTANCES**:

Email the Request for Missed Term Work Accommodations form (<http://uoft.me/PSY-MTW>) form to Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)), along with:

- For the **death of a family member/friend**, provide a copy of the death certificate.
- For U of T varsity-level or professional **athletic commitments**, an email from your coach or varsity administrator should be sent directly to Keely ([keely.hicks@utoronto.ca](mailto: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 ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)) **well in advance** of the missed work.
- For circumstances **outside of these guidelines**, please email Keely ([keely.hicks@utoronto.ca](mailto:keely.hicks@utoronto.ca)) **on or before the date of the test / assignment deadline** to describe your circumstances and determine appropriate documentation.

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

As stated above, your documents must be submitted **within three (3) business days** of the deadline for the missed work.

**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. If your original medical note / documentation included the date of the make-up midterm, then only the Request form is required. If the date of the make-up midterm fell outside of the dates indicated on your original medical note/other documentation, then a new medical note/other appropriate documentation must also be submitted.

### **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](mailto: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.

### **NOTE: Assignments due at end of term**

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.utscc.utoronto.ca/registrar/term-work>).

### **NOTE: Final Exams**

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

## VII. Links you might find useful

UTSC Dates and Deadlines <https://www.utscc.utoronto.ca/registrar/dates-and-deadlines>

### Skill building, future planning

Academic Advising, Career Centre <http://www.utscc.utoronto.ca/aacc/>

Writing Services <http://www.utscc.utoronto.ca/twc/>

Presentation Skills <http://www.utscc.utoronto.ca/ctl/presentation-skills>

Co-op Program <http://www.utscc.utoronto.ca/askcoop/>

### Your well-being

AccessAbility <http://www.utscc.utoronto.ca/~ability/>

Health and Wellness <http://www.utscc.utoronto.ca/hwc/>

Test anxiety [https://www.anxietybc.com/sites/default/files/Test\\_Anxiety\\_Booklet.pdf](https://www.anxietybc.com/sites/default/files/Test_Anxiety_Booklet.pdf)

### The Department of Psychology

UTSC Psychology <http://www.utscc.utoronto.ca/psych/>

UTSC Psychology courses <http://www.utscc.utoronto.ca/psych/courses>

UTSC Experiential Learning <http://www.utscc.utoronto.ca/psych/experiential-learning>

Psychology lab opportunities <http://tinyurl.com/jjq25t7>

Psi Chi @ UTSC <https://www.utscc.utoronto.ca/projects/psichi/>

## PSYB03: Course Schedule

May be subject to minor revisions with advance notice from the instructor

- Week 1 (8-11 Sep):** Navigating Matlab & directory structure
- Week 2 (14-18 Sep)** Matrices and basic calculations
- Week 3 (21-25 Sep):** Data types
- Week 4 (28 Sep–2 Oct):** Control flow
- Week 5 (5-9 Oct):** Functions
- Week 6 (12-16 Oct):** NO CLASS (Reading week)
- Week 7 (19-23 Oct):** Statistical tests 1
- Week 8 (26-30 Oct):** Study space for MIDTERM EXAM (No class)
- Week 9 (2-6 Nov):** Prompting for input & timing (experimental data collection)
- Week 10 (9-13 Nov):** Plots and graphs
- Week 11 (16-20 Nov):** Introduction to image processing (stimulus displays)
- Week 12 (23-27 Nov):** Statistical tests 2
- Week 13 (30 Nov - 4 Dec):** Image processing (cont'd) and review