PSYB03H3 S – Introduction to Computers in Psychological Research
Winter 2018

Class meeting time: Monday 11-1pm; Lab: Monday 1-2pm; Room SW316
Instructor: Dr. Adrian Nestor
Office hours: Tuesday 2-3pm
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(*Please put PSYB03 in the subject line of any e-mails
and use your U of T e-mail account when contacting the course instructor)

Teaching Assistants: Chi-Hsun (Eric) Chang & Shouyu Ling
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Office hours: Thursday 11-12pm (SW413A) – Chi-Hsun (until reading week)
Office hours: Thursday 2-3pm (SW411B) - Shouyu (after reading week)

1. GENERAL COURSE INFORMATION

Calendar description: The course will provide introductory knowledge and hands-on training in computer-based implementations of experimental design, data processing and result interpretation in psychology. The course covers implementations of experimental testing paradigms, computational explorations of empirical data structure and result visualization with the aid of specific programming tools.

Prerequisite: PSYA01 and PSYA02
Corequisite: PSYB07 or STAB22
Online resources: Blackboard
Course reading: Links to readings, resources, and software (provided through Blackboard). The student version of Matlab (ver 2012 or higher) is recommended.

2. COURSE DESCRIPTION

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.

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).

3. CLASS SCHEDULE

Week 1 (January 8): Navigating Matlab & directory structure
Week 2 (January 15) Matrices and basic calculations
Week 3 (January 22): Data types
Week 4 (January 29): Control flow
Week 5 (February 5): Functions
Week 6 (February 12): Statistical tests 1
February 19: NO CLASS (Reading week)
Week 7 (February 26): Midterm exam
Week 8 (March 5): Prompting for input & timing (experimental data collection)
Week 9 (March 12): Plots and graphs
Week 10 (March 19): Introduction to image processing (stimulus displays)
Week 11 (March 26): Statistical tests 2
Week 12 (April 2): Image processing (cont'd) and review

4.0 EVALUATION

Lab activities/assignments: 28%
Midterm exam: 32%
Final exam: 32%
Participation: 8%

Lab activities/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 in lab or online. This component of the grade will be based on the best 7 (out of 8) assignments.

Midterm exam (32%)
The midterm test will take place during regular class time and will cover material from lectures, labs, and activities.

Final exam (32%)
The exam will cover material from all lectures, labs, and activities.

Class participation (8%)
You are expected to participate actively in class (e.g., by contributing new ideas, by asking questions, by answering questions). Failure to engage in class discussions will result in losing a percentage of your final grade.

5.0 COURSE POLICIES

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, according to UTSC policy, I am not permitted to extend the deadline for any assignment past the last day of classes, so be sure to submit all materials by that time. If necessary, students may petition the Registrar's office for permission to submit assignments after the last day of classes. Such petitions are not automatically granted, and will likely be denied without a valid reason. Such petitions must be submitted by the last day of the final examination period of the term.

Missed Term Work due to Medical Illness or Emergency

All students citing a documented reason for missed term work (this includes assignments and midterm exams) must bring their documentation to the Undergraduate Course Coordinator, Ainsley Lawson, <u>within three (3) business days</u> of the term test / assignment due date. All documentation must be accompanied by the departmental **Request for Missed Term Work form** (http://uoft.me/PSY-MTW).

In the case of missed term work due to illness, only an <u>original copy</u> of the **official UTSC Verification of Illness Form** (http://uoft.me/PSY-MED) will be accepted. 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.

In the case of other emergency, a record of visitation to a hospital emergency room or copy of a death certificate may be considered.

<u>Forms should be dropped off in SW427C between 9 AM - 4 PM, Monday through Friday.</u> Upon receipt of the documentation, you will receive an email response from the Course Instructor / Course Coordinator within three business days. The Course Instructor reserves the right to decide what accommodations (if any) will be made for the missed work.

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

<u>Failure to adhere to any aspect of this policy may result in a denial of your request for accommodation.</u>

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.

Video and auditory recording

For reasons of privacy and protection of copyright, unauthorized video/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 (e.g., in the case of private use by students with disabilities).

6.0 OTHER INFORMATION

Academic integrity

UTSC aims to ensure that a degree from the University of Toronto reflects clearly and adequately each student's academic achievement. As a result, the University takes issues of academic integrity very seriously. The Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm) outlines behaviors that constitute academic dishonesty and the process for addressing academic offences.

Potential offences include, but are not limited to:
o Using someone else's ideas or words without appropriate acknowledgement.
o Making up sources or facts.
o Obtaining or providing unauthorized assistance on any assignment.
o Looking at someone else's answers during an exam or test.
o Misrepresenting your identity.
o Falsifying institutional documents or grades.
o Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

If you have questions or concerns about what constitutes appropriate academic behavior 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 (http://www.utoronto.ca/academicintegrity/resourcesforstudents.html).

AccessAbility

Students with any type of disability/health consideration that may require specific accommodations are encouraged to contact the AccessAbility Services Office as soon as possible. After you have provided the appropriate documentation, the staff in this office will assess your needs and will determine appropriate and reasonable accommodations. All enquiries and information that Access*Ability* Services collects from students about their disabilities will be kept in strict confidence.

The UTSC AccessAbility Services (S302, 416-287-7560, ability@utsc.utoronto.ca) are available by appointment to assess specific needs, to provide referrals and to arrange appropriate accommodations.

Help with writing

If you do not feel comfortable with your writing abilities or if you intend to improve on them, the following resources are available to you:

The Centre for Teaching and Learning (http://ctl.utsc.utoronto.ca/twc/) offers students one-to-one appointments and supplementary materials to help improve upon their writing skills.

The English Language Development Centre (http://ctl.utsc.utoronto.ca/eld/) offers support and specialized writing programs for students who do not speak English as their primary language. Additional advice on academic writing can be found at: http://www.writing.utoronto.ca/advice