Syllabus Psychology 363 Fall 2019

Computing and Psychology Research

Britt Anderson

<2019-08-21 Wed>

1 Instructor and TA Information

Role	Name	Office	Email	Phone	Hours
Instructor	Britt Anderson	PAS 4039	britt@uwaterloo.ca	x33056	By Arrangement
TA	Martin Turpin	PAS 4043	mhturpin@uwaterloo.ca		TBD

2 Course Description

2.1 Course Goal:

Improve your ability to use your computer as a tool for academic activities.
This leads to the following learning objectives

2.2 Learning Objectives:

- Learn how to install software.
- Learn how to work from the command line.
- Learn the rudiments of programming sufficient to allow further progress through self study.
- Learn about the use of libraries to enable programming psychological experiments.
- Learn how to use version control
- Learn how to write papers that blend code and analyses to generate reproducible research reports. This includes learning
  - how to use citation databases
  - generate graphics of analyses
  - conduct statistical analyses
  - generate multiple output formats from a single source file.

2.3 Course Mechanics

To meet the learning objectives you will need to be **doing** much more than listening or observing. You will also need to break old habits. That means in the beginning it will be harder to do simple things. It also means that in the future things that used to be impossible for you to do will now be possible (but they may still not be easy). Combining computer skills with with your psychology content knowledge makes you more attractive to employers and on a graduate school application.

Thus, this course will require you to use the Linux operating system (the XUbuntu flavor) and tools available within that space. Later on, after this course, if you wish to return to the world of OSX and Windows10 you will know what you are looking for, and you will have the skills necessary to make it available.

2.4 Required Text

None

2.5 Course Outline

Week	Date	Topic	Other
1	Sept 10	Installing OS and Software - Linux	
2	Sept 17	Command Line Basics and EMACS	
3	Sept 24	Version Control (Git) and beginning with Python	
4	Oct 1	Python	
5	Oct 8	R	
6	Oct 22	Data Handling in R and Python	
7	Oct 29	Introduction to Plotting	
8	Nov 5	Programing Psychology Experiments in Python	
9	Nov 12	Writing Research Reports	
10	Nov 19	Final Proj Session 1: Programming your Experiment	
11	Nov 26	Final Proj Session 2: Data Collection	
12	Dec 3	Final Proj Session 3: Analysis and Start of Report Drafting	

2.6 Grades

Your grade in this course will be made up of participation, assignment, and final project components. In addition, there is the option to earn extra credit for research participation.

Component	Proportion
Research	+ 4%
Assignments	50%
Final Paper/Project	30%
Participation	20%

2.6.1 Components Explained

Research As this course is devoted to learning research relevant skills participating in research studies can be a useful way to better understand the participant's perspective when you design your studies. This is especially true for on-line work. I encourage you, even if you do not need the credits, to consider research participation for the perspective it will give you on the tools and techniques you learn in this course. I will provide extra credit of up to 4% in value for research participation. Half of these credits can be for Online studies and students may complete Mass Testing. If you are taking multiple psychology courses do be careful about assigning your credits to eligible courses.

Assignments I will do my best to create a bunch of these as we go along so that you will have the chance to get frequent feedback on your work while the weight of any one assignment can be small. That way we don't have to worry too much if you miss one or just do not get something. Move on. These assignments will be described in class and also given a Dropbox on Learn for you to use to signal to me that you have completed the assignment. In many cases the actual work will not be something that you can submit in Dropbox. For example, I may have you post code or text on the courses Github page. Make sure that even in that case that you not only do the assignment, but that you also trigger the Dropbox with a comment of completion. The grades will be recorded in Learn so that you can track your performance.

Participation This is an aggregate assessment that accumualtes through your attendance, interactions with the professor and other student to explore the content, raise questions and objections, and collaborate with your peers. It is a small class and easy to walk around and see who is on the sidelines and who is collaborating. A fair proportion of this credit will be given for the quality and esprit with which the student shares their project experiences in the pdf, html5, or js presentations that will be shared on the last class date. Come to all the classes, and engage with your classmates and the material and you should be able to get all the credit for this component.

Final Project This may be the most challenging component and the one that will ultimately stratify the class's performance. You will submit for your final project a paper (pdf preferred but html acceptable). While the final project will involve group collaborations on protocol programming and data collection, each student individually is responsible for writing up that data and submitting their own final paper. The paper will outline the motivations for a simple experiment with appropriate APA style citations (at least five (5)) cited in the text and included in a bibliography at the end. It will describe the method of the experiment that you will program in Python using the Psychopy library. Source code should be included as

an appendix. Data will be collected from classmates (in class time will be provided). This will not be real research data, but will provide the subtrate for analysis and plotting and experience with the challenges of programming an experiment and then using that code to gather data. The report should include simple summary statistics and at least two plots visualizing pertinent aspects of the data. This report must be reproducible. You can use any format that allows me to compile the final paper from the data files and the source files, which you are also required to submit. The `.org` format is recommended as that is the one that will be demonstrated in the course, but alternatives would include `Rmd` and `Rnw`.

3 Late Work Policy

For full credit work must be turned in on time as specified in the Learn Dropboxes. However, as this is a class dedicated to doing, late assignments will be considered for partial credit up to the date of the Final Project being due. We will agree this date together in class.

4 Plagiarism

Don't use other peoples work, and don't steal other people's code (though do reuse other people's code liberally - just give them credit).

5 Attendance

Your participation and activity in class is one of the ways I guage your participation grade. If you are not in class I can't say that you participated. In this way absences impact your grade, but there is no formal attendance policy that results in an automatic loss of credit for unexcused absences.

6 Boiler Plate

6.1 Academic Integrity

In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility. See the Office of Academic Integrity webpage for more information.

6.2 Discipline

A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. Check the Office of Academic Integrity for more information. A student who

is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about rules for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline. For typical penalties check Guidelines for the Assessment of Penalties.

6.3 Grievance

A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 - Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact the departments administrative assistant who will provide further assistance.

6.4 Appeals

A decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 - Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 - Student Appeals. Note for Students with Disabilities The AccessAbility Services office, located on the first floor of the Needles Hall extension (NH 1401), collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AS office at the beginning of each academic term.