Laboratory in Human Cognition
Psychology V89.0046
Fall 2015

Instructor
Todd Gureckis, todd.gureckis@nyu.edu, 859 Meyer, after class, or by appt.

Teaching Assistant
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Writing Instructor
tbd, office hours by appointment, 411 Lafayette Rm. 412 (Writing Center)

Schedule
Mondays and Wednesdays, 3pm – 3:50pm, 159 Meyer.

Course Description
This course provides hands-on experience with the standard experimental tools used in cognitive psychology research. Students run experiments, collect and analyze data, write research reports, and design and run a new experiment as a final project. Additionally, students read and analyze research papers that use complex and expensive experimental methods that cannot be directly explored in the classroom. Content areas include memory, categorization, attention, learning, automaticity, and visual perception. Lectures introduce new skills that apply not only in analyzing, communicating, and presenting scientific work, but more broadly how to effectively communicate complex scientific ideas. The course culminates in an intensive final project involving the design and analysis of a novel experiment.

Course Website:
http://gureckislab.org/courses/fall15/lhc/
Bookmark this and return often. Lectures, handouts, and updates on schedule will be provided here.

Laboratory Software
We will be using a combination of open-source tools for running experiments and performing statistical analysis. Thus, there is nothing to purchase! We will use Microsoft Excel and perhaps other tools such as R for data analysis**.

Readings
There is no textbook for this course. However, the following may come in handy in writing your reports:

- *Publication Manual of the American Psychological Association* (5th ed.). (2001). Washington, DC: American Psychological Association.

No readings from this book will be assigned, and much of the content, is available on-line via judicious Google searches. There will be other readings made available as PDF files or handouts in class.

Experiments
We will be collecting data in three experiments in class, using each other or possibly Internet users as experimental subjects. The data will be compiled, then analyzed in class and written up

outside of class. The final project will involve proposing, implementing, running, and writing up an experiment in a group. Work on the final project will begin in the early part of the semester and continue intermittently until the final weeks.

Attendance
Attendance and participation in lectures and labs is essential. There are in-class tasks and assignments in most class periods that cannot be made up later. Attendance at in-class experimental data collection sessions is mandatory. Students who are absent during data collection will receive a 50% penalty on the lab report for that experiment, no exceptions.

Writing
Lab reports will be APA-style research reports. Specific assignments will be explained in handouts and discussed in class. Reports will be graded on the quality of the ideas and thinking, prose style, and on adherence to APA format. Lab Report 1 will be reviewed by the Writing Instructor, and in subsequent labs students will have the opportunity to meet with the Writing TA at their own scheduling. 10% of each paper's grade will be an evaluation by the writing TA of the quality and clarity of the writing. In addition, student who need help with writing are encouraged to stop by the NYU Writing Center for one-on-one consultation with a writing expert (more information here: http://www.nyu.edu/cas/ewp/html/writing_center.html).

Teams
For some (but not all) assignments (definitely final project), students will be assigned to work in teams. Teamwork is an important skill in successful research and in life. In scientific research, papers often include an acknowledgements section which details the contribution of each author. Each assignment completed in a team must include a similar statement of the specific contributions of each person.

Readings
To supplement the hands-on-skills developed in this course, we will read a number of real, life (sometimes cutting edge) research papers together. Some of the papers will focus on the different types of data available to experimental psychologist including fMRI, EEG, MEG, eye-tracking, etc. There will be short assignments related to these papers, as well as in-class discussion and tours/demonstrations of some of NYU's equipment (when possible).

Grading
Grades will be weighed as follows:

- 10% attendance, participation, and in-class assignments
- 25% final project
- 15% assignments on readings
- 50% lab reports (12.5% each)

There may be opportunities for small amounts of extra credit, such as for brief presentations to the class on various topics.

Academic Misconduct
All work that students turn in must be their own work. For group assignments, all work must have been done by the students on the team and must include an acknowledgements section detailing the contribution of each team member. Any outside sources (articles, books, people) must be appropriately cited in written assignments. Turning in someone else's work as your own is unacceptable and will result in a failing grade. On the basis of past experience with intellectually lazy students, I have written an automated algorithm written in python that can detect examples of copying from electronic sources such as Wikipedia in submitted papers (yeah it is so easy to

plagiarize even a computer script can do it!). More importantly, such behavior is academically dishonest and lazy. Submit only your own ideas and words, or there will be consequences to your academic career.

Research Ethics and Misconduct
Although the experiments performed in this class are for educational purposes, and therefore not covered by the usual informed consent regulations, we will try to treat the confidentiality of the data as if it were. Falsification of any data or analysis will result in a failing grade for the course. (Note that grades are not based in any way on getting statistical significance or any particular result!)

****Statistics Software**
Note that part of the class will be learning to use R and excel software packages for data analysis. We will be teaching these skills in the class. However, if you find that you need extra assistance, the Bobst library provide statistical consultants who are familiar with these packages. According to their webpage:

Consultation information will be available on the 6th floor in rooms 620 and 621* via e-mail
(data.service@nyu.edu), telephone 212-998-3434, by appointment or on a walk-in basis. Staff and student consultants
will offer free tutorials and workshops on a variety of statistical packages. Sign up for fall software tutorials on the library's
classes page: http://www.library.nyu.edu/forms/research/classes.html

Class Schedule
Each class session may cover several of a variety of topics and tasks. The schedule below is guaranteed to change! Check the class webpage for the most recent information (http://gureckislab.org/courses/fall15/lhc/)

Date	Topics
Sept. 2	Introductions, Why Study Human Cognition?
Sept. 7	No class, labor day
Sept. 9	What make a good (or bad) Experiment? - Designing experiments to test hypothesis
Sept. 14	Communicating Results (basic introduction to APA styled papers), What are cognitive models, and how are they used to help design experiments?
Sept. 16	How do we determine truth? A gentle introduction to data analysis and statistics in Excel
Sept. 21	Replication initiatives in psychology
Sept. 23	Online data collection methods (Mechanical Turk, etc…)
Sept. 28	Planning experiments - Power analyses, samples sizes
Sept. 30	**Experiment 1 data collection**

Oct. 5	**Experiment 1 data analysis**
Oct. 7	**Experiment 1 data analysis** What makes a good figure? Creating accurate and informative figures. Error bars and how to (mis)use and (mis)interpret them.
Oct. 12	No class, columbus day
Oct. 14	**Experiment 2 data collection, Lab report 1 due**
Oct. 19	**Experiment 2 data analysis -** Analyzing continuous measures like reaction time (RT)
Oct. 21	**Experiment 2 data analysis -** Beyond pairwise contrasts: ANOVA (cont.)
Oct. 26	**Experiment 2 data analysis -** Beyond pairwise contrasts: ANOVA (cont.)
Oct. 28	**Experiment 2 data analysis -** Beyond pairwise contrasts: ANOVA (cont.)
Nov. 2	**Experiment 3 data collection, Lab report 2 due**
Nov. 4	**Experiment 3 data analysis** - Regression and multiple regression
Nov. 9	**Experiment 3 data analysis** - Regression and multiple regression (cont.)
Nov. 11	**Experiment 3 data analysis** - Regression and multiple regression (cont.)
Nov. 16	Bayesian data analysis, Final project time
Nov. 18	No class (pre-thanksgiving break… you may plan your travel accordingly)
Nov. 23	Final project time
Nov. 25	**Lab report 3 due**, Final project time
Nov. 30	How to give a good scientific talk/Final project time
Dec. 2	Final project time/Mini-conference (if needed)
Dec. 7	Final project time/Mini-conference (if needed)
Dec. 9	Mini-conference
Final exam time (see university schedule)	Mini-conference (final **paper due)**