Overview

This course aims at being a microcosm of science, in particular, the science of how the mind works. It is designed to take you through the next step after Psych 100B in your understanding of how science operates. Whereas Psych 100B covers basic scientific methodology in psychology, here we add a focus on science as explanations. You will apply concepts you learned in Psych 100B to find valid answers to questions on cognition. But you will in addition pay attention to formulating and evaluating the questions themselves. Until you have posed a good question, you cannot give an interesting answer.

More so than other college courses, a lab course embraces the philosophy of learning-by-doing. Your own research project, conducted in collaboration with several classmates, will serve as the main medium for learning how research in cognitive psychology operates. Early on, we will provide you with some research topic suggestions covering a range of topics in cognition. While you think over and formulate the research question to pursue in your project, we will cover some basic concepts on scientific hypothesis testing in the philosophy of science and in statistics. We will also illustrate scientific hypothesis testing with specific experiments on cognition. You may choose to do your project on the illustrated topics or other topics on cognition.

In the first few weeks, there will be two homework assignments, intended as warm-ups for writing the Introduction and the Method and Results sections of your final project. The rest of the quarter will be devoted to developing and executing your own research project. Students will work on their projects in groups of four typically. Your team will formulate a research question and design an experiment to answer it. In the process, you will receive multiple rounds of feedback. This stage will result in your team’s Project Proposal. You will then conduct the experiment, analyze the results, and write a paper to communicate your findings to a scientific audience. You will be given guidance at every step. Your team will jointly prepare and submit a single Method and Results section of your project paper. But each student will individually write up the rest of the project paper (Title, Abstract, Introduction, Discussion, and References). During 10th week, each team will give a brief oral presentation on their project. We hope to give
you a choice of presenting to our class only or in a joint session with another Psych 121 class.

**Grading:** Grading is based on a write-up of the Method and Results of one of our demonstration experiments (10%), an essay that presents two explanations (10%), a final project proposal (25%), a final project paper (40%), class participation (10%), and an oral presentation (5%). Criteria for evaluating project papers: motivation, originality, validity, accuracy, and clarity.

**Course Outline**

**Week 1**  
*Reading homework:*  
- Shermer (2002)  
- Waldmann & Dieterich (2007)

*Class activities:*  
- Demonstration Experiment 1  
- Course overview  
- Group discussion: Explain selected findings on embodied cognition and moral reasoning  
- Research project topic ideas

**Week 2**  
*Reading homework:*  
- Hawking and Mlodinow (2010)  
- Nieuwenhuis, Forstmann & Wagenmakers (2011)

*Class activities:*  
- Discussion of scientific hypothesis testing:  
  - What is a scientific hypothesis?  
  - Theory-based versus intuition-based predictions  
  - Confirmation and disconfirmation  
  - Truth versus better explanations (Hawking and Mlodinow’s view of scientific and everyday explanations – is it different from yours?)

  Examine results of demonstration experiment  
  More research topic ideas

**Jan 21 (Sun: 11.59pm) Due:**  
*Introduction section warm-up exercise:*

*Essay presenting two explanations of moral dilemma scenarios*

**Week 3**  
*Class activities:*  
- Demonstration Experiment 2  
- Conceptual review of statistics  
- Explore forming project groups: Discuss formulation of projects  
- Review of how to write a psychology paper

**Jan 28 (Sun: 11.59pm) Due:**  
*Method and Results warm-up exercise:*

*Method and Results of Demo Experiment 1*

**Week 4**  
*Class activities:*  
- Discuss preliminary project proposals

**Two types of course projects:**  
1) theoretical project on cognition -- test two or more alternative explanations  
2) applied project on cognition -- test efficacy of a cognitive treatment  
-- must pass the Grandmother Test
Week 5  
Class activities: Continue discussion of project proposals  
Feb 6 (Tues: 11.59pm)  
Due: Initial draft of project proposal (ungraded, one from each group)

Week 6  
Class activities: Continue discussion of project proposals  
Feb 18 (Sun: 11.59pm)  
Due: Final project proposal

Week 7  
Class activities: Obtain final design approval, refine materials, collect pilot data  
Feb 25 (Sun: 11.59pm)  
Due: Preliminary data (each group must turn in data from 5 subjects in a clearly interpretable format, along with a brief assessment of your current method)

Week 8  
Class activities: Continue projects: refine materials, collect pilot data  
Feb 27 (Tues: 11.59pm)  
Optional: Draft of Introduction section of project if you’d like feedback

Week 9  
Class activities: Continue projects: collect, score, and analyze data  
Mar 4 (Sun: 11.59pm)  
Optional: Draft of Method section if you’d like feedback

Week 10  
Class activities: Finish up projects and present findings  
Mar 15 (Thurs in class)  
Oral presentations (date & time are tentative, pending coordination with the other Psych 121 class)

Finals Week  
Mar 22 (Thurs: 11.59pm)  
Due: Final project papers
Required Readings


Recommended Readings


