Honors Research Design, Analysis, and Presentation

Fall Semester, 2011

Rutgers University Psychology Department

Course Information:

Rutgers Course Number: 01:830:TBD
Date and Time: TBD
Location: TBD
Credit hours: 3
Prerequisite: Acceptance into the Psychology Honors Program.

Instructor:

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Office: Psych 308 (Busch Campus)
Office Hours: TBD

Learning Goals for this Course: Performing original scientific research in Psychology can be a highlight of your Rutgers career, but it is also a novel challenge for most students. The purpose of this course is fivefold. First, it will broaden your formal education in research design, analysis, and presentation to complement and extend your ongoing research project. Second, it will give you the opportunity to get feedback from your peers and professor as you formally present your plans and progress in class. Third, it will provide hands-on training in scientific writing. Fourth, it will expose you to the extraordinarily broad range of subjects explored and techniques applied in the many different areas of Psychology. Finally, it will foster the development of a community of Psychology Honors students to provide mutual support throughout the semester. The specific skills you will learn in this course include:

- Experience considering a wide range of experimental designs, including hypothesis specification, subject selection, and issues of sensitivity / power.
- Completion of written assignments on increasingly detailed and technical subjects, beginning with short, ungraded essays on paradigm shifts in recent history, graduating to writing about and making scientific figures, and finally handing in a draft and then revision of their Honors Thesis Introductions and Methods
- Application of statistical methods to real-world datasets and careful interpretation of the results.
- Practical knowledge of how to visually display complex datasets and prepare publication-quality figures
- Formal training and experience in both delivering and critiquing scientific presentations, including public speaking and poster presentations.

Textbook: *The Visual Display of Quantitative Information,* by Edward Tufte (2001) Second Edition, ISBN #0961392142.

Attendance & Grading: Attendance in this course is mandatory, and the roll will be taken during each class. Students are permitted three unexcused absences. For the fourth and every subsequent absence, students will be penalized the equivalent of half a letter grade, unless they

arrange and complete a written make-up assignment. Research-related travel (e.g. presenting your Honors project at a scientific conference) will always be excused.

Conduct: Students are expected to pay attention in class. Use of computers and other electronic devices for anything other than note-taking is distracting to fellow students and is not permitted. All students must comply with the University's Academic Integrity Policy, which can be found at http://academicintegrity.rutgers.edu/.

Sakai: The course has a dedicated Sakai site at sakai.rutgers.edu. All registered students should automatically be members of the site. The site includes downloadable readings for the course, this syllabus, a chat room, and a venue for announcements to the class. This is the tool I will use to email the entire class when necessary.

Evaluation: This class will include both graded and ungraded assignments. If you fail to complete an ungraded assignment you will be penalized half a letter grade.

Ungraded:	Essay on an example of a Kuhnian paradigm shift (2 pages)
	Diagnostic quiz on applied statistics
	Essay on your favorite figure from Tufte's textbook (2 pages)
	The first in-class presentation (3 minutes) on your Honors project, no Powerpoint allowed.
	Peer critiques of student presentations
Graded:	The second, in-class presentation (15 minutes) on your Honors project (30%)
	Your flow chart illustrating your experimental design (10%)
	Your Introduction and Methods sections for your thesis (50%)
	Your in-class participation, including questions during student presentations (10%)

Please be aware that correct sentence structure, grammar, and spelling are expected in answers to all written assignments. When in doubt, consult the APA. Publication Manual or Strunk and White's *Elements of Style*.

Course Schedule

NOTE: The due dates for assignments are definite, but the exact schedule of which material is covered on which day may vary slightly.

Week 1

Topics: Overview of Honors research process, perspectives on science (Hume, Kuhn, Eccles, and Popper); intro to public speaking
In-class activities: Statistics diagnostic quiz
Student presentations: Students 1-5, 3-minute intro.

Week 2

Assignment due: Paradigm shift essay
Topics: Experimental design (hypothesis testing, within vs between subjects designs; factorial designs; confounds; controls; planned comparisons; subjects; approvals)
In-class activities: Two Truths and a Lie
Student presentations: Students 6-15, 3-minute intro.

Week 3

Assignment due: Flow chart showing experimental design
Topics: Graduate school (choosing programs, preparing an application, interviewing)
In-class activities: Scenes from a Hat
Student presentations: Students 16-25, 3-minute intro.

Week 4

Topics: Data Analysis, Part 1: Comparison of Groups (means, medians, and standard errors, paired and unpaired t-tests, one-way & two way ANOVA, interaction, post-hoc testing, reporting stats).
In-class activities: Interactive editing of student essays
Student presentations: Students 26-35, 3-minute intro.

Week 5

Assignment due: Essay on favorite figure from Tufte's textbook
Topics: Data Analysis, Part 2, Beyond the Hegemony of the Mean (Variance, regression & correlation; subsets of data & preplanning comparisons; Bonferroni correction).
In-class activities: Discussion forum on student research concerns
Student presentations: Students 36-40, 3-minute intro.

Week 6

Topics: Data display (rich bar charts, within-subjects registration, scatterplots).
In-class activities: Pass the Ball
Student presentations: Students 1-5, 20-minute presentation/discussion/critique.

Week 7

Assignment due: Peer critiques of student presentations
Topics: Literature review (Data sources, logical flow, paragraph structure, hypothesis statement, references, plagiarism)
In-class activities: Scenes from a Hat
Student presentations: Students 6-10, 20-minute presentation/discussion/critique.

Week 8

Assignment due: Peer critiques of student presentations
Topics: Writing a methods section (replicability, validation, references)

Student presentations: Students 11-15, 20-minute presentation/discussion/critique.

Week 9

Assignments due: Peer critiques of student presentations

Topics: How to practice explaining your data (a.k.a. How to Bore Your Roommates)

Student presentations: Students 16-20, 20-minute presentation/discussion/critique.

Week 10

Assignment due: DRAFT OF INTRO & METHODS SECTIONS; Peer critiques of student presentations

Topics: Challenges in student research (null results, no results, weird results)

In-class activities: Discussion forum on student research concerns

Student presentations: Students 21-25, 20-minute presentation/discussion/critique.

Week 11

Assignment due: Peer critiques of student presentations

Topics: Critiquing scientific literature

In-class activities: Interactive editing of student Introductions

Student presentations: Students 26-30, 20-minute presentation/discussion/critique.

Week 12

Assignment due: Peer critiques of student presentations

Topics: Preparing a scientific poster and preparing for a poster session

In-class activities: Interactive editing of student Methods sections

Student presentations: Students 31-35, 20-minute presentation/discussion/critique.

Week 13

Assignment due: Peer critiques of student presentations

Topics: Course wrap-up and review of outstanding requirements for the Honors program

In-class activities: Discussion forum on student research concerns

Student presentations: Students 36-40, 20-minute presentation/discussion/critique.

LAST DAY OF CLASS: INTRODUCTION AND METHODS SECTIONS DUE BY EMAIL TO PROFESSOR MCGANN, COPIED TO YOUR ADVISOR