

# Honors Research Design, Analysis, and Presentation

## Fall Semester, 2017

### Rutgers University Psychology Department

#### Course Information:

Rutgers Course Number: 01:830:490

Date and Time: Fridays from 10:20-1:20

Location: SEC-212

Credit hours: 3

Prerequisite: Acceptance into the Psychology Honors Program.

#### Instructor:

John P. McGann

Email: john.mcgann@rutgers.edu

Office: Psych 311 (Busch Campus)

Office Hours: Fridays from 1:30 to 2:30 (after class)

**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 your 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.

**Textbooks:** *The Visual Display of Quantitative Information*, by Edward Tufte (2001) Second Edition, ISBN #0961392142 is a required text, though you may not need to purchase it. This text will only be used explicitly in one week of the class, but provides a useful perspective on the process of preparing your data for presentation and will be the subject of a written assignment. The Rutgers Library Call number for this book is QA276.3.T83 2001, and it is circulating through the Math Library on Busch and on reserve in the Art Library on College Ave. In addition, I recommend *They Say, I Say: The Moves that Matter in Academic Writing* by Graff and Birkenstein (2010) 2<sup>nd</sup> edition ISBN #978-0-393-93361-1 as a supplementary text on academic writing.

**Attendance & Grading:** Attendance in this course is mandatory. The roll will be taken at the *beginning* of each class (you are required to sign the attendance sheet every week), and late-arriving students may or may not be permitted to sign in at Professor McGann's discretion. There are only a limited number of class meetings, so any absence is a significant loss. Students are permitted three absences. For the fourth and every subsequent absence, students will be penalized the equivalent of half a letter grade (e.g. a B+ becomes a B). In accordance with Rutgers policy, absences for religious observance or participation in Rutgers-approved activities do not count against the limit, nor does research-related travel (e.g. presenting your Honors project at a scientific

conference). However, students are required to report ALL absences using the Rutgers absence reporting system at <https://sims.rutgers.edu/ssra>. This will result in an email sent to Professor McGann. Please note that all assignments are due by the date specified on the syllabus, regardless of excused absences, unless an extension is explicitly granted. Even if you will not be attending class, you must still email your assignment to Professor McGann on time.

**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](http://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 (e.g. a B+ becomes a B).

*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 (12 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%)

ALL written assignments must be BOTH submitted in hard copy in class AND emailed to Professor McGann as a PDF file. This allows extensive annotation on the hard copy (which will be returned to you) and the copy and pasting of text and images for in-class editing. Late work will not be accepted. The final version of the Introduction and Methods paper (due on the last day of school) must be copied to your adviser when you email it to Professor McGann.

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*.

**Student Writing:** Student writing, including both graded and ungraded components, will be publicly (and interactively) edited as part of the course. If you hand it in, it might end up on the projection screen. While the student's name will not be explicitly included, it is often nonetheless possible for other students to guess the author based on content or style. Please understand that this is an essential part of the teaching process and that individual students will not be singled out without reason.

**Honors Reception:** Midway through the semester Dr. McGann will host a reception at his home for current Psychology Honors students and recent Honors alumni. This event is principally for the benefit of current students, who will have the opportunity to get to know each other better in an informal setting and to learn about the thesis process, graduate school applications, job prospects, etc. from recent graduates. Previous Honors students have found this event to be extremely valuable and your attendance is expected. Carpooling arrangements will be made in class that morning.

# 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 – Sept. 15

Topics: Overview of Honors research process, theoretical perspectives on scientific progress; intro to public speaking

In-class activities: Student survey, interview drill

## Week 2 – Sept. 22

**Assignment due: Paradigm shift essay**

Topics: Experimental design (hypothesis testing, within vs between subjects designs; factorial designs; confounds; controls; planned comparisons; subjects; approvals), design flow charts

In-class activities: Diagnostic statistics quiz; Two Truths and a Lie (Public speaking exercise – audience interaction)

Student presentations: Students 1-5, 3-minute elevator pitch.

## Week 3 – Sept. 29

**Assignment due: Draft of flow chart showing experimental design (for peers)**

Topics: Graduate school (choosing programs, preparing an application, interviewing)

In-class activities: Interactive editing of student essays, flow chart group editing

Student presentations: Students 6-10, 3-minute elevator pitch.

## Week 4 – Oct. 6

**Assignment due: Draft of flow chart showing experimental design (handed in draft)**

**Reading due: All of Tufte's textbook**

Topics: Data display (rich bar charts, within-subjects registration, scatterplots), how to use OriginPro

In-class activities: Interactive editing of student essays, Scenes from a Hat (Public speaking exercise – word choice)

Student presentations: Students 11-15, 3-minute elevator pitch.

## Week 5 – Oct. 13

**Assignment due: Essay on favorite figure from Tufte's textbook**

Topics: Responsible Conduct of Research (Responsibilities as an Honors student, plagiarism, authorship, etc.), comments on flow charts

In-class activities: Interactive editing, graduate school group discussions

Student presentations: Students 16-21, 3-minute elevator pitch.

## Week 6 – Oct. 20

**Assignment due: Flow chart showing experimental design (final)**

Topics: Literature review (Data sources, logical flow, paragraph structure, hypothesis statement, references, plagiarism), writing a methods section (replicability, validation, references)

In-class activities: Discussion forum on student research concerns; Pass the Ball (Public speaking exercise – projection & gestures). Preparation for full talks.

## Week 7 – Oct. 27

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 1-3, 12-minute presentation/discussion/critique.

## Week 8 – Nov. 3

**Assignment due: Peer critiques of student presentations**

Topics: Data Analysis, Part 2, Beyond the Hegemony of the Mean (Variance, regression & correlation; subsets of data & preplanning comparisons; Bonferroni correction).

In-class activities: Interactive editing of student essays, Scenes from a Hat (Public speaking exercise – word choice)

Student presentations: Students 4-6, 12-minute presentation/discussion/critique.

Week 9 – Nov. 10

**Assignment due: Peer critiques of student presentations**

**Assignments due: DRAFT OF INTRO & METHODS SECTIONS**

Topics: Data Analysis, Part 2, Beyond the Hegemony of the Mean (Variance, regression & correlation; subsets of data & preplanning comparisons; Bonferroni correction).

In-class activities: Interactive editing of student essays

Student presentations: Students 7-9, 12-minute presentation/discussion/critique.

Week 10 – Nov. 17

**Assignments due: Peer critiques of student presentations**

Topics: To be determined by student needs.

In-class activities: Interactive editing of student Intro & Methods, Monsters (Public speaking exercise – confidence & projection)

Student presentations: Students 10-12, 12-minute presentation/discussion/critique.

Week 11 – Nov. 22 **NOTE: THIS IS A WEDNESDAY!**

**Assignment due: Peer critiques of student presentations**

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

In-class activities: Interactive editing of student Introductions & Methods

Student presentations: Students 13-16, 12-minute presentation/discussion/critique.

**NOVEMBER 24 – THANKSGIVING BREAK – NO CLASS**

Week 12 – Dec. 1

**Assignment due: Peer critiques of student presentations**

Topics: How to practice explaining your data (a.k.a. How to Bore Your Roommates), How to write Results and Discussion sections, Preparing a scientific poster and preparing for a poster session

In-class activities: Interactive editing of student Introductions & Methods

Student presentations: Students 17-21, 12-minute presentation/discussion/critique.

Week 13 – Dec. 8

**Assignment due: Peer critiques of student presentations**

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

In-class activities: Mentored writing, editing, figure-making

Student presentations: Overflow day for students excused from their assigned slot, 12-minute presentation/discussion/critique.

**DECEMBER 13: FINAL INTRODUCTION AND METHODS SECTIONS DUE BY EMAIL TO PROFESSOR MCGANN, COPIED TO YOUR ADVISOR**

NOTE: The Honors Reception will be scheduled for an evening midway through the semester.