Conduct of Inquiry Laboratory I
Government 096-001

Ryan T. Moore*

5 October 2015 at 12:17

Course Information

Government GOVT 096-001
Conduct of Inquiry Laboratory I
Tuesday, 1 Sept and 8 Sept, 2.35-3.50pm Anderson B-12
Tuesday, 15 Sept, 2.35-3.50pm, Mary Graydon Center 323
Tuesday, 22 Sept and after, 2.35-3.50pm Anderson B-12

Instructor Information

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Ghazal Nadi
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Course Description

This course should be taken in conjunction with Conduct of Inquiry I, GOVT 612 ("Conduct I"), the first course in the required two-course sequence in quantitative methods for School of Public

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Affairs Ph.D. students. This laboratory will focus on two areas; it will introduce computing skills for social scientific research and presentation generally, and it will reinforce statistical skills and concepts introduced in Conduct I. Class meetings will include demonstrations of and opportunities to work through applied examples of data management, data analysis, and computing. As time allows, we will also work through problem set exercises from Conduct I. Students may use computers in the lab, or bring their own laptops to class.

Learning Objectives

By the end of the course, you should be able to

- Use R to import and manipulate data, implement appropriate techniques

- Use R to implement the techniques of Conduct of Inquiry I

- Typeset social scientific methods and results legibly, likely using LaTeX

Readings

Readings should be completed before the course meeting under which they are listed below. The primary textbook for Conduct I is

> Imai, Kosuke. *A First Course in Quantitative Social Science*. Princetion University Press, Princeton, NJ, 2016.

and the associated datasets for examples and exercises are all available at https://github.com/kosukeimai/qss.

There are many excellent textbook and online resources for computing. Several good 1- to 2-page cheatsheets are available. The interactive R package Swirl is designed to teach you R from within R itself, and is the source of some Review Exercises we may offer for additional practice.

Other useful resources for R include

> William N. Venables, David M. Smith, and the R Development Core Team. *An Introduction to R*. 2010. ISBN 3-900051-12-7.

> Paul Teetor. *R Cookbook*. O'Reilly Media, Inc, Sebastopol, CA, 2011.

Other useful resources for LaTeX include

> Tobias Oetiker, Hubert Partl, Irene Hyna, and Elisabeth Schlegl. The Not So Short Introduction to LaTeX2ε. *distributed with LaTeX2ε, Version*, 4:24, 2008.

> Michel Goossens, Frank Mittelbach, and Alexander Samarin. *The LaTeXCompanion*. Addison-Wesley, New York, 1994.

Assignment	Weight	Due date
Problem Sets	5%	Weekly
Midterm Meeting	5%	6 Oct - 16 Oct
Participation	90%	Weekly

Table 1: Course Assessment Summary

Requirements and Evaluation

Students are required to do the weekly reading, attend class, complete all assignments and exams, contribute significantly to in-class group work, and participate in course discussions about the material. Using the Conduct I course email list to ask and answer questions is strongly encouraged, and will contribute to your participation evaluation.

No late work will be accepted. If you cannot submit an assignment on time, arrange to submit it early. We encourage you to use office hours to discuss any specific assignments, difficulties, or questions about the course.

Academic integrity is a core value of institutions of higher learning. It is your responsibility to avoid and report plagiarism, cheating, and dishonesty. Please (re-)read the University policy on academic integrity at http://www.american.edu/academics/integrity/code.cfm, particularly Sections I and II.

Software and Statistics Support

The primary software for the course is R. See ryantmoore.com/writings/htr.pdf for help getting started. Support for statistical software is available through CTRL. See http://j.mp/ZrBr2Z for CTRL's workshop schedule.

The Department of Mathematics and Statistics offers statistical consulting services, with extensive hours. For the schedule and contact information, see http://j.mp/1EmVqkY.

The library itself offers support for various software. For example, they can help you troubleshoot issues with your LaTeX installation.

Graduate Certificate in Applied Statistics

If you are interested in political methodology or applied statistics, consider completing the Graduate Certificate in Applied Statistics. In addition to learning exciting new techniques, certification can help you distinguish your skills and commitment to methods from those of others applying for the same positions you are. More information is available at http://www.american.edu/cas/mathstat/CERT-GAS.cfm.

Intellectual Property

Course content is the intellectual property of the instructor or student who created it, and may not be distributed without consent.

Course Evaluation

The course evaluation will take place in class towards the end of the semester. Students who submit the evaluation will earn one percentage point toward the participation grade.

Further Information from American University

For more information on Academic Integrity, Emergency Preparedness, Academic Support, and Social Media, please see ryantmoore.com/files/class/auSyllLanguage.pdf

Calendar

I. Introduction and Preliminaries.

1 September

Introduction. Course policies and requirements. Computing. Installing LaTeX and compiling your first document.

Required reading.

This syllabus.

My 3-page intro to LaTeX, at ryantmoore.com/writings/httex.pdf.

8 September

Installing R. Installing RStudio. Loading R packages.
Data types in R.
LaTeX for PS 0.
Homework assignment due: compile a paper you've written using LaTeX.

Required reading.

Imai, §1.3.0 (pages 1-3)

My 1-page intro to R, at ryantmoore.com/writings/htr.pdf

II. Causal Inference

15 September

Logicals and conditionals in R.
PS 1 questions.

22 September

Descriptive statistics in R.
PS 2 questions.

29 September

Missing data in R. Correlations in R.
PS 3 questions.

6 October

Visualization and graphics in R.
PS 4 questions.
Homework assignment due: meet this week or next about PS, exam, paper.

III. Linear models

13 October

Loops in R. Linear regression in R.
PS 5 questions.
Homework assignment due: meet this week or last about PS, exam, paper.

20 October

Midterm Exam review.

27 October

Multiple regression in R.
PS 6 questions.

IV. Topics in Statistical Discovery

3 November

Text analysis, networks, and mapping in R.
PS 7 questions.

V. Probability, Uncertainty, and Inference

10 November

Probability and distributions in R.
PS 8 questions.

17 November

Statistical uncertainty in R.
PS 9 questions.

24 November

No class meeting.

1 December

Modeling in R.
PS 10 questions.