

Quantitative Methodology Laboratory II

Government 096-001

Ryan T. Moore*

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Course Information

Government GOVT 096-001
Conduct of Inquiry II Laboratory
Tuesday, 8.55-10.10am, Bender Library Room B60

Instructor Information

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Course Description

This course should be taken in conjunction with Conduct of Inquiry II, GOVT 613 (“Conduct II”), the second course in the required two-course sequence in quantitative methods for School of Public 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

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concepts introduced in Conduct II. 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 II. 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, and implement appropriate techniques
- Use R to implement the techniques of Conduct of Inquiry II
- Typeset social scientific methods and results legibly, likely using L^AT_EX

Readings

Readings should be completed before the course meeting under which they are listed below. The primary textbooks for Conduct II are

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

and

John Fox. *Applied Regression Analysis and Generalized Linear Models*. Sage Publications, Thousand Oaks, CA, 3rd edition, 2016.

The associated datasets for examples and exercises for the Imai text are available at <https://github.com/kosukeimai/qss>.

The course's companion guide for R is

John Fox and Sanford Weisberg. *An R Companion to Applied Regression*. Sage Publications, Inc., Thousand Oaks, CA, 2011.

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 L^AT_EX include

Tobias Oetiker, Hubert Partl, Irene Hyna, and Elisabeth Schlegl. The Not So Short Introduction to L^AT_EX_{2 ϵ} . *distributed with L^AT_EX_{2 ϵ} , Version*, 4:24, 2008.

Michel Goossens, Frank Mittelbach, and Alexander Samarin. *The L^AT_EX Companion*. Addison-Wesley, New York, 1994.

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.

Assignment	Weight	Due date
Problem Sets	5%	Occasional
Midterm Meeting	5%	After Spring Break
Participation	90%	Weekly

Table 1: Course Assessment Summary

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 <http://www.ryantmoore.org/files/ht/htr.pdf> for help getting started. Support for statistical software is available through CTRL. See **TK** 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 L^AT_EX 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.

Calendar

I. Introduction and Preliminaries. Computing.

12 January

Introduction. Course policies and requirements. \LaTeX templates. Review of PS 0.

Required reading.

This [introduction](#) to \LaTeX .

II. Topics in Statistical Inference and Causality.

19 January

PS 1 questions.

Required reading.

This syllabus.

26 January

PS 2 questions.

2 February

PS 3 questions.

III. Linear Modeling

9 February

PS 4 questions.

16 February

PS 5 questions.

23 February

PS 6 questions.

1 March

Midterm Exam review.
Paper proposal due.

8 March

Spring Break. No class meeting.

15 March

Midterm exam questions.
Properties of least squares review and continuation.

22 March

PS 7 questions.

IV. Problems (and Solutions) in Ordinary Least Squares

29 March

PS 8 questions.

5 April

PS 9 questions.

12 April

PS 10 questions.

19 April

Final topics.
Paper presentations.

26 April

AU Spring Study Day. No class meeting.

3 May

Final paper due, noon.