



Two important notes:

- All problem sets will be due *at the beginning of class* on the day they are due. *I will not accept late problem sets*. Also, these are in-depth, intense assignments, so you will not want to wait until the last minute to start them. I strongly suggest working on the assignments progressively as we get through the relevant material.
- I encourage you to work with your classmates on the problem sets. Collaboration can be beneficial for mastering the material. However, *you must do your own work*. That is, while you can work together, *the final product that you hand in must be your own work*.

**2. Midterm Exam (100 points):** *Wednesday, March 12*

**3. Final Paper (100 points):** Due *Tuesday, May 20*. For the final paper, you will use the skills you have learned throughout the class to analyze and write up results from an OLS model (or models) using your own data. Importantly, the paper project is also intended to give you practice toward mastering the art of writing a research paper (in particular, discussing results and how they relate back to the substantive research question(s), the theory, and hypotheses). The paper should be roughly 10-12 pages (double-spaced) and it should resemble the second half of a journal article. The paper will be written as if the intro, literature assessment, and theory sections have already been written. Use a small amount of space giving me a rough outline of the research question, literature assessment, and the theory. List the hypotheses to be tested, and then write up the data and results section as you would do for a journal article. I strongly encourage you to think about your research question very early in the semester and to make progress on the paper gradually throughout the semester. Students should touch base with me about their papers—particularly regarding the data they are interested in analyzing—sometime before the midterm exam.

**AMERICANS WITH DISABILITIES ACT**

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

**ACADEMIC INTEGRITY**

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report and suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>.

**CRITICAL INCIDENT MANAGEMENT**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

## COURSE OUTLINE AND SCHEDULE

- I. *Statistical inference and preliminaries for linear regression*** – Fox, Ch. 1-3
- Statistical inference and political methodology [Mon, 1/28]
  - Data structures, levels of measurement, and relationships [Mon, 1/28]
  - Descriptive representations of relationships – graphing [Wed, 1/30]
- II. *Scalar approach to regression*** – Fox, Ch. 5-6
- Simple regression and the method of ordinary least squares (OLS): Assumptions, estimation, and properties of the OLS estimator [Mon, 2/4 & Wed, 2/6]
  - Simple regression: Interpretation, inference and hypothesis testing [Mon, 2/11 & Wed, 2/13]
  - Simple regression: Goodness of fit [Wed, 2/13]
  - Multiple regression: Assumptions and estimation [Mon, 2/18 & Wed, 2/20]
  - Multiple regression: Interpretation, inference, hypothesis testing, and goodness of fit [Wed, 2/20 & Mon, 2/25]

**\*\* Problem Set 1 due Wed, 2/27**

- III. *Matrix approach to regression*** – Fox, Ch. 9
- Reviewing matrix algebra [Wed, 2/27]
  - Deriving the OLS estimator using matrix algebra [Wed, 2/27, Mon, 3/3, & Wed, 3/5]
  - Inference, properties, etc. [Wed, 3/5 & Mon, 3/10]

**\*\* Midterm Exam: Wed, 3/12**

**\*\* SPRING BREAK – No Class Mon, 3/17 and Wed, 3/19**

**\*\* Problem Set 2 due Mon, 3/24**

- IV. *Regression diagnostics and remedies***
- Outliers and influential data – Fox, Ch. 11 [Mon, 3/24]
  - Heteroskedasticity – Fox, Ch. 12 [Wed, 3/26 & Mon, 3/31]
  - Nonnormality – Fox, Ch. 12 [Mon, 3/31 & Wed, 4/2]
  - Multicollinearity – Fox, Ch. 13 [Mon, 4/7 & Wed, 4/9]
  - Autocorrelation – Fox, Ch. 14 (14.1) [Wed, 4/9 & Mon, 4/14]
  - Measurement error – Fox, pp. 130-132 [Wed, 4/16]

**\*\* No class on Mon, 4/21 (Passover)**

**\*\* Problem Set 3 due Wed, 4/23**

- V. *Thinking about model specification***
- Nonlinearity and data transformation – Fox, Ch. 4 & pp. 309-318 [Wed, 4/23]
  - Dummy variables – Fox, Ch. 7 (7.1 & 7.2) [Mon, 4/28]
  - Interaction terms – Fox, Ch. 7 (7.3) [Wed, 4/30 & Mon, 5/5]
  - Specification error; omitted variable bias – Fox, pp. 237-238 [Wed, 5/7]
  - Endogeneity and simultaneity bias – Fox, pp. 235-237 [Mon, 5/12]

**\*\* Problem Set 4 due Fri, 5/16**

**\*\* Final Paper due Tues, 5/20**