Prof. Mark Long
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Class meets: Monday 1:30-4:20 in Parrington 108
Office Hours: Friday 1-2:30 PM and by appointment.

Teaching Assistant: Shane Johnston
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Office Hours Location: Parrington 124 D
Office Hours: Mondays from 5-7, and Thursdays from 1:30-3:15.
Review Session: Tuesday 8:30-9:20 or Thursday 12:30-1:20 in Parrington 106.

Course Website: https://canvas.uw.edu/courses/1043091.
Course listserv: pbaf528b_sp16@uw.edu

Course Description and Objectives
This course is the second in a two-course sequence aimed at helping Evans School MPA students become informed users and critical consumers of research and statistical analyses. This course introduces the application of probability, hypothesis testing, and confidence intervals to multivariate models in the context of policy and management research. We strive to isolate and measure the effects of one factor (an independent variable – often the introduction of a policy) on an outcome (a dependent variable) while controlling any other factors. We begin with the linear regression model in its basic form and move on to modeling techniques. Along the way we will consider some of the limitations and potential problems associated with using regression models and alternative models. Students will develop a first hand appreciation of these topics through in-class exercises and homework problems.

By the end of this course, you will:
• Understand how complex policy analysis can be conducted using multivariate regression analysis.
• Be aware of the conditions necessary to establish causal relationships on a given outcome, emphasizing the need to disentangle the effects of multiple factors.
• Select appropriate univariate, bivariate, or multivariate analytic techniques to answer a given policy or management question.
• Understand the mechanics, assumptions, and interpretation of regression models to policy or management questions, how to use regression models for both prediction and hypothesis testing, and the assumptions behind and possible "fixes" for problems with models.
• Learn how to read and analyze empirical studies
• Recognize how policy analysis, program evaluation, and performance measurement employ research methods and statistical techniques.
• Be exposed to nonlinear models and understand their purposes.
**Readings**

Required Textbook:


Other required readings will be emailed to you.

**Software**

I will teach you how to use STATA. I personally prefer STATA to SPSS as I believe that it has easy to use syntax for manipulating data and running regressions – which can be useful for more extensive research projects (e.g., for your degree project).\(^1\) STATA also has pull down menus like SPSS. A STATA tutorial will be emailed to you and discussed in the first review session on Tuesday/Thursday. Note that while employers of MPA/MPP students are a bit more likely to seek workers with SPSS experience than STATA experience, having familiarity with both SPSS and STATA will increase the rate of jobs you will be qualified from 65% up to 81% -- see figure 3 of http://www.naspaa.org/jpaemessenger/Article/VOL19-1/11_AdamsInfeldWulff.pdf. Also, you will be better trained by having exposure to multiple statistical software packages.

Stata is available on the CSDE and Evans School servers. If you are interested in buying your own copy of STATA, individual student licenses for Stata/IC 14 cost $75 for 6 month or $198 for a perpetual license: [http://www.stata.com/order/new/edu/gradplan.html](http://www.stata.com/order/new/edu/gradplan.html).

Excel may also be useful for some of the assignments and for data manipulation.

**Grading and Requirements**

The course requirements include six homework sets, two in-class exams, and a final data analysis exam. The purpose of the two in-class exams is to help diagnose your progress in learning the mechanics and interpretation of regression. [*The in-class exams will be closed book, but you will be allowed to use 2 pages (4 sides) of notes.*] The data analysis exam allows you to consolidate your learning about regression models, apply what you are learning to a policy context.

Homework assignments (on time and complete for credit) 10% of final grade
Exam 1 in the discussion section (April 26 or 28) 30% of final grade
Exam 2 in the discussion section (May 24 or 26) 30% of final grade
Data Analysis Exam (take home, due June 7 at 11:59PM) 30% of final grade

**Course Policy on Missed or Late Assignments**

Answer keys for the problem sets will be available on Canvas by class-time the day the assignments are due. Answers received after class will not be reviewed or receive credit. If you cannot submit the homework on time, I recommend that you complete it anyway so that you learn the material.

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\(^1\) Although SPSS can also be “programmed”, I am more familiar with STATA programming. In addition, I find STATA to have an intuitive programming language – it’s easy to learn – trust me!
If an emergency prevents you from taking one of the exams, you must contact me in person, by phone, or by email BEFORE the class.

**Tips to Do Well in Class**

- **Do the reading before you come to class.** Hearing the material after having read it will help things make sense to you. I plan class exercises and lecture with the assumption that you’ve done the reading.
- **Come with questions** to class and review section. If you do not understand something, ask questions about it in class or in the review session. Usually, you are not the only one who has the same question.
- **Attend class and review section regularly** and keep up with your assignments.
- A good way of learning statistics is to **discuss the material with someone else**. To that end, I recommend you form a study group with whom you work on problem sets. Set a time regular time to meet. Ask questions among yourselves. Seeing material from the perspectives of others will help you better to formulate your understanding of the material. You should hand in your own work after having reviewed your responses to the problems with your group.
| Month | Date | Topic                                                                 | Reading                                                                 | Due before Monday Lecture |
|-------|------|----------------------------------------------------------------------|***************************************************************************|----------------------------|
| March | 28   | Introduction to Regression Analysis                                   | Studenmund Ch. 1-2                                                       |                            |
| April | 4    | Using Regression Analysis and Hypothesis Testing                       | Studenmund Ch. 3-5                                                       | HW1                        |
| April | 11   | Multivariate Regression                                               | Studenmund Ch. 6                                                         | HW2                        |
| April | 18   | Multivariate Regression (Continued)                                    |                                                                        | HW3                        |
| April | 25   | Specification: Choosing a Functional Form                              | Studenmund Ch. 7                                                         |                            |
|       |      | *April 26 or 28: Exam 1 in Discussion Section*                         |                                                                        |                            |
| May   | 2    | Specification: Choosing a Functional Form (Continued).                 | Studenmund Ch. 8-10                                                      | HW4                        |
|       |      | Multicollinearity, Serial Correlation, and Heteroskedasticity          |                                                                        |                            |
| May   | 9    | Multicollinearity, Serial Correlation, and Heteroskedasticity (Continued). Dummy Dependent Variables and Fixed Effects Models | Studenmund Ch. 13, 16.2                                                  | HW5                        |
| May   | 16   | Dummy Dependent Variables and Fixed Effects Models (Continued).        |                                                                        | HW6                        |
| May   | 30   | No Class -- Memorial Day                                               |                                                                        | *May 24 or 26: Exam 1 in Discussion Section*                            |
|       |      | *June 10: Data Analysis Take-Home Exam Due*                            |                                                                        |                            |