The University of Chicago Booth School of Business
BUS 41100: Applied Regression Analysis
Syllabus for Spring 2016

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Course Site: `bobby.gramacy.com/teaching/ara`

Office 338: I will generally be available Monday – Saturday by appointment (email is best)

TA: Mohammad Moravvej (`moravvej@uchicago.edu`)

Course Summary:

BUS 41100 is a course about regression, a powerful and widely used data analysis technique. Students will learn how to use regression to analyze a variety of complex real world problems. Heavy emphasis will be placed on analysis of actual datasets. Topics covered include: simple linear regression, multiple regression, prediction, variable selection, residual diagnostics, time series (auto-regression), and classification (logistic regression).

Text/Notes

There is no course pack or required textbook for the class. All lecture notes and course materials will be available on the class website.

I would recommend *A Modern Approach to Regression with* R, by Simon Sheather, which is a useful reference text and provides a more detailed description of many topics than we will see in class. Although some of this text is advanced, most of the material and level of presentation is similar to that of our course. In addition, the authors website has R-code to accompany the text as well as translation of most procedures into both STATA and SAS.

If you want a more traditional textbook to supplement your instruction, *Applied Regression Analysis*, by Terry Dielman, offers a helpful alternative presentation of the material.

Computing

Analysis will be primarily conducted in R. This open-source software is freely available for download at `www.r-project.org`, and you can find manuals and installation guidelines on this site. I will demonstrate analysis with R in class and provide code to accompany lectures.

R has a command line interface (you type commands to get what you want). I strongly encourage you to install the software as soon as possible and get familiar with simple operations. There are also some great video tutorials (with code) to accompany Sheathers book, available at `dist.stat.tamu.edu/pub/rvideos`.

If you strongly prefer, you may use other software; however, I do not recommend it.

Prerequisites:

BUS 41000 or equivalent is prerequisite. This includes a command of the basics of probability and the following concepts: random variables (and functions thereof), normal and t-distributions, hypothesis testing, confidence intervals, and sampling distributions. I will not teach basic statistics in 41100 and it is your responsibility to ensure that you have a complete command of these concepts (available for review in any decent statistics textbook).

Evaluation:

Grades will be determined by **homework/quizzes (15%)**, a **midterm exam (30% in-class exam + 5% project due with the exam)**, and a **take-home final exam (50%).**

There will be 7 homework assignments collected each week according to the schedule below. Students are encouraged to form groups (max size 3) for homework and only one write-up per group need be turned in. **Late homework assignments will not be accepted.** Only the best 6 of 7 assignments will be counted towards your grade. Homework assignments will be submitted in class and should have a clear and professional presentation.

The midterm exam will be given in your 6th class. This is a closed-book exam, but you may bring one letter size (both sides) cheat sheet. **A 5% midterm take-home project will be available the week before your midterm, and is due at the start of the exam.**

The individual take-home final exam will be due the first week after your last class. Except for limited email queries (cc TA), questions about the exam will be restricted to the last class.

No request for rescheduling will be entertained on or after the date of an exam. Only extreme personal problems are a reason for rescheduling.

Re-grades: Clerical errors will be corrected without hassle, but other requests must be submitted **in writing**, with **peer approval** and **within one week** of the homework/exam return; the entire exam will be subject to re-marking. See the web page for more information.

Students must adhere to *Booth Honor Code*. But you do not need to include the honor code, and signatures, etc., on your work.

Schedule:

HW1 due on April 6/9
HW2 due on April 13/16
HW3 due on April 20/23
HW4 due on April 27/30
Midterm — May 4/7 (5% Project component will be made available on April 27)
HW5 due on May 18/21
HW6 due on May 25/28
HW7 due on June 1/4
Take-Home Final will be available on May 25 and is due Wednesday, June 8.