

## ISU Economics 671, Econometrics 1 (Fall 2009)

This class has three goals. You are going to study and learn some fundamental techniques in econometrics and statistics so that you can use them in your future research. You are also going to learn some of the basic theoretical concepts in econometrics so that you can understand new techniques when you encounter them in future classes and later in your career. Finally, you're going to learn how to use a computer to do statistical and econometric analysis.

### Contact information

If you have questions about the course material, the best times to address them are in the scheduled lectures or during office hours. We can probably resolve questions or concerns about the course administration over email, but if you have urgent questions please call me or stop by my office.

Instructor:	Gray Calhoun	<a href="mailto:gcalhoun@iastate.edu">gcalhoun@iastate.edu</a>	Heady 467	(515) 294-6271
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### Scheduling

The class will meet twice a week for almost two hours. The next table lists the most important times and dates. If you have any conflicts please let me know as soon as possible.

Lectures	Mondays and Wednesdays, 9:00–10:50 a.m.
Review sessions	Fridays, 3:00–4:50 p.m.
Instructor office hours	Mondays and Wednesdays, 3:00–4:00 p.m.
TA office hours	Tuesdays and Thursdays, 3:00–5:00 p.m.
Midterm exam	7 October, 9:00–10:50 a.m.
Final exam	18 December, 7:30–9:30 a.m.

The weekly review session will be used primarily for discussion of the homework exercises, but will also be used to present new material that supplements the regular lecture. The first two review sessions will cover matrix algebra and the R programming language respectively.

### Grading

Your final grade will be based on two exams and some homework exercises. The breakdown is listed in the following table. Note that the “final” exam is worth the same as the “midterm” exam.

Midterm exam	25%
Final exam	25%
Homework assignments	25%
In-class presentations	25%

The in-class presentations will work like this: for the last ten minutes of each lecture, one or two students will be called at random to present their solutions to some of the homework assignments (the exact number of students and questions will depend on the time available). We'll discuss each solution together as a class and try to think of alternative approaches that could be used and possible improvements that could be made. You will be graded on your presentations as well as your participation when your classmates are presenting.

## Textbooks

The required textbooks are Greene's *Econometric Analysis, 6th Edition* and Zeileis and Kleiber's *Applied Econometrics with R*. The first book will be a useful reference later in your career. The second book is relatively cheap and is also available online through the library (we have an institutional subscription to SpringerLink, which is the publisher's website for e-books). You may want to save pdf versions of its chapters to your computer instead of purchasing the book from the bookstore. You should also download and install the R package that accompanies this book, called the *AER* package.

There are several other books you may want to check out but are not required this semester. Casella and Berger's *Statistical Inference* is recommended, especially for the first half of the course; it covers basic probability and statistics more thoroughly than we will in this class. I've put a copy on reserve at the library for your reference and I encourage you to purchase your own copy online. You'll be required to buy Hayashi's *Econometrics* next semester, so you may want to buy it now as another source of material. You can download manuals for R from <http://cran.r-project.org/manuals.html>.

You can also find copies of *Applied Econometrics with R* and *Statistical Inference* in the "Help Room" in Heady Hall.

## Software

You need to learn how to program a computer to do statistical and econometric analysis. We're going to use the programming language R in this class—it is a specialized programming language that is designed for sophisticated data analysis. It has three advantages over other statistical packages: it is very extensible, so designing and using new estimators is easy; the graphics it produces are excellent; and it is free (other packages have their own advantages as well, obviously). Also, I use R in my own research so my advice on programming is more likely to be useful than if we were to use another language. You can download the latest version of R from the website <http://www.r-project.org>.

## Course Material

The first exam will cover basic probability and statistics, and the second exam will cover basic regression analysis. Chapters in Greene's, Kleiber and Zeileis's, and Casella and Berger's textbooks are denoted **Gr**, **KZ**, and **CB** respectively. The material from Greene's and Kleiber and Zeileis's textbooks is required. Chapters for Casella and Berger's are listed for your own reference.

<b>Overview</b>	Introduction	week 1	<b>Gr</b> 1; <b>KZ</b> 1, 2
<b>Part 1</b>	Probability	1–4	<b>Gr</b> A.7, A.8, B, D; <b>CB</b> 1–4, 10
	Statistics	4–7	<b>Gr</b> C, 16.1–16.4, 18.1, 18.2, 18.4; <b>KZ</b> 7.3; <b>CB</b> 5–9
<b>Part 2</b>	Basic linear regression	8–10	<b>Gr</b> 2–4; <b>KZ</b> 3.1, 3.2; <b>CB</b> 11
	Inference	11–13	<b>Gr</b> 5; <b>CB</b> 11
	Extensions	14, 15	<b>Gr</b> 6, 7, 8; <b>KZ</b> 3.3, 3.4, 4.1