Introduction to Econometrics

Prof. J.T. Toman	**Economics 4818**
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303 492 3248	**Spring 2007**

Office Hours:
1332 Grandview Ave
M: 2-3:30pm
Th: 4-5:30pm

Course Description
Introduction to Econometrics introduces students to econometric analysis. It aims to have students reach the level of multiple least squares regression analysis by the conclusion of the course. (See the outline below for topics covered.) The course has both theoretical and practical elements. Students will be expected to master econometric theory and material taught in the computer lab.

The prerequisite for this course is Economics 3818, <u>Introduction to Statistics</u>.

Text
The textbook for the course is *Undergraduate Econometrics, 2nd edition*, by R. Carter Hill, Griffiths, W., and Judge, G. (2001) Wiley, New York.

Please note: This textbook is quite expensive ($118). However, this edition has been in print for 6 years, so there are many second hand copies around for a lot less! I looked on Amazon, and saw that it was possible to get a second hand copy for about $50, which seems reasonable.

<u>Supplementary Text:</u>
Reiman, M. and R. Carter Hill (2001) *Using EViews for "Undergraduate Econometrics, 2nd Edition"*, Wiley, New York

Please note: This is not required, but could be useful. It contains a student version on EViews, so you can load the computer program on your personal computer and do the computing part of the problem sets at home. If you are struggling with the computing part of the course, I would recommend this book. Again, it can be purchased second hand as it has been in print for a number of years.

Computer Program
The computer program for the course is EViews.

Class Schedule
The class meets Tuesday, Thursday 2:00 - 3:15pm, HLMS 241

Assessment
The assessment for this course is divided between problem sets, a midsemester exam and the final exam.

Problem Sets
There will be 10 problem sets due throughout the semester. Problem sets are issued in Tuesday lecture. They are due the following Tuesday, in lecture. The answers will be discussed in class the Thursday lecture, after they are due.

Problem sets will be based on the work we are covering in lectures. They may require you to use EViews, the computer program we are using this semester.

1. For handing in an attempted problem set, you will get 1 point per problem set. This rewards "having a go". The problem set must be attempted. There will be no point awarded for a blank piece of paper, or a piece of paper with the questions written on it, and no other working.

2. During the semester, two problem sets with be RANDOMLY chosen for grading. **YOU WILL NOT KNOW BEFOREHAND which problem set will be chosen!** Each problem set chosen is worth 10 points.
               LATE PROBLEM SETS WILL NOT BE ACCEPTED!

Assessment	Description	Worth
Problem Sets	10 due throughout the semester	1 point each
2 random Problem Sets	2 graded throughout the semester	10 points each
Mid-Semester Exam	In-Class: **March 8 2007**	30 points
Final Exam		40 points

Classroom Behavior
Students are expected to behave in accordance with the University of Colorado at Boulder policies of classroom behavior. For any questions regarding what these are, students are refered to http://www.colorado.edu/policies/index.html. Clearly, plagarism, cheating or harrassment will not be tolerated.

Religious Observance
Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, I ask that you let me know of a conflict with at least one week's notice, so I can work out an alternative arrangment. See full details of the Univerisity Policy at http://www.colorado.edu/policies/fac_relig.html.

Topic Outline

Topic 1:   **Introduction and Review**
Principles of econometric modeling
Probability and random variables
Discrete and continuous random variables

Reading: Hill et al (2001) Chapter 1, Chapter 2, sections 2.1, 2.2, 2.6

Topic 2:   **Describing Probability Distributions**
Expectations (means and variances)
Joint random variables
Covariance, correlation

Reading: Hill et al (2001) Chapter 2, sections 2.3, 2.4, 2.5

Topic 3:   **Random Sampling**
Random samples; distribution of mean and variance
Sampling from normal populations
Central Limit Theorem

Topic 4:   **Simple Linear Regression**
Population regression model
Sample regression function
Interpretation of parameters and estimates
Properties of least squares estimators
Gauss Markov Theorem

Reading: Hill et al (2001) Chapters 3, 4

Topic 5:   **Inference in Simple Regression**
Chi-square and t-distributions
Confidence Intervals
Hypothesis testing
Prediction

Reading: Hill et al (2001) Chapter 5

Topic 6:   **Regression Model Applications**
Goodness of fit;
Functional forms
Applications

Reading: Hill et al (2001) Chapter 6

Topic 7:   **Multiple Regression Model**
Population regression model
Sample regression function
Interpretation of parameters and estimates
Tests of parameters individually
F-distribution
Tests of parameters jointly
Omitted and Irrelevant variables
Multicollinearity

Reading: Hill et al (2001) Chapter 7, 8

Topic 8:   **Dummy Variables**
Modelling with dummy variables
Interactions
Seasonality

Reading: Hill et al (2001) Chapter 9

Topic 9:   **Heteroskedasticity**
The heteroskedasticity problem
Detection tests
Remedies

Reading: Hill et al (2001) Chapter 11

Topic 10:   **Autocorrelation**
The autocorrelation problem
Detection tests
Remedies

Reading: Hill et al (2001) Chapter 12