

## INTRODUCTION TO APPLIED ECONOMETRICS I - COURSE OUTLINE

This course provides an introduction to applied econometrics. The target audience is Kellogg graduate students interested in quantitative research. The main focus of the course is to provide students with the necessary quantitative skills to (a) read and criticize published research articles (b) conduct independent quantitative research for papers and dissertations (c) progress to more advanced quantitative courses. The prerequisite for the course is at a minimum an undergraduate introductory class in statistics (or equivalent). Rudimentary knowledge of linear algebra is also required (matrix algebra will be covered/reviewed in class). While the course will provide the appropriate theoretical background for the topics covered, the main approach is “hands-on”, i.e., application-oriented.

**Course Materials:** The recommended text book for the class is *Econometric Analysis*, William H. Greene, 5th edition, Prentice-Hall, 2003. There is a new 6th version, but you are welcome to use either. The text book will be supplemented by hand-outs and articles.

**Lectures:** We will meet on Thursdays, 2pm-5pm in Leverone 488 (this is the conference room in the Marketing Department).

**Week 1** INTRODUCTION:

1. Introduction to Econometrics
2. Software and computers
3. Review of probability (random variables, distributions, moments)

**Week 2** REVIEW OF STATISTICS:

1. Review of basic statistics (estimators, properties of estimators)

**Week 3** GENERAL ESTIMATION THEORY:

1. Method of Moments
2. Maximum Likelihood
3. GMM

**Week 4** THE LINEAR MODEL I:

1. The Simple Linear Regression Model
2. Assumptions

3. OLS

**Week 5** THE LINEAR MODEL II:

1. Review of Matrix Algebra
2. Assumptions of the Linear Model
3. OLS

**Week 6** THE LINEAR MODEL III:

1. Practical Aspects/Implementation of OLS
2. Inference
3. Applications

**Week 7** THE LINEAR MODEL IV:

1. Specification testing
2. Failure of Model Assumptions (multicollinearity, heteroscedasticity, autocorrelation)
3. Heteroscedastic Consistent Standard Errors
4. GLS
5. Applications

**Week 8** MULTIVARIATE ANALYSIS

1. The SURE Model
2. Factor Analysis
3. Endogeneity Concerns
4. Applications

**Week 9** ENDOGENEITY AND CAUSAL INFERENCE:

1. Identification of Causal Effects
2. Instrumental Variables
3. Introduction to System Estimation (2SLS)
4. Matched Sampling
5. Applications

**Week 10** PANEL DATA

1. Introduction to Panel Data
2. Simple Panel Data Estimators