Intermediate Econometrics (YSS2211)

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Course Overview

Econometrics combines Economic Theory, Statistics, and Mathematics. This course is designed to acquaint you with the statistical methods that economists use to test economic models and examine empirical relationships, primarily regression analysis. Although much of the course will focus on the mathematical development of the methodology, real world applications will be introduced frequently to demonstrate how these tools are used in practice. Students will learn to use a statistical software package, STATA, to analyze data.

Course Schedule:

Regular Class Lecture: Wednesday and Friday 14.30-16. Room: Y-EC-GLRm1.
STATA sessions: Wednesday 16.30 – 17.30. Room: Y-EC-GLRm1.
Note: Wednesday STATA sessions will be announced in advance. They may be used as standard lecture sessions, or problem set solving sessions.

Recess week: Saturday February 20 to Sunday February 28.

Last day of classes: Friday, April 15.

Final Exam: to be determined by Registry.

Textbooks:

"*Introduction to Econometrics*" by James Stock and Mark Watson, Third Edition, Pearson Publishing

"A Guide to Modern Econometrics", by Marno Verbeek, Wiley.

None required, but very recommended to have at least one in hand regularly.

Other recommended sources (by topic, below)

Grading:

Assessment for this course will be based on problem sets, midterm and final exams, evaluation of in-class participation and in-class tests. The format, grading and exact due dates of the assignments will be discussed during lectures. **Late assignments will not be accepted, unless**

you have a VR note explicitly requesting for it. Unless otherwise specified, students are expected to be hand in written assignments individually.

- Class Participation 5%
- In-class tests 5%
- Problem Sets 24% (6% each for best 4, worst dropped)
- Midterms 30% (best 20%, worse 10%)
- Final 36%

Midterms will take place on week 6 and week 10 or 11 (specific day to decide depending on assignments you may have in other classes). Students who are unable to write the midterm because of an illness, family emergency or religious observance will have the midterm weight shifted to the final examination. **Documentation MUST be provided within three business days after the midterm exam. Students should be aware that no "make-up" midterms will be given.** There will be no make up midterm or final exams. If you believe you are going to miss one, and you have a legitimate reason, you will need a vice-rector's note

Topics:

1. Introduction to Econometrics
2. Review of Probability and Statistics
3. Introduction to matrix algebra
4. Simple regression model with one regressor
    a. Hypothesis testing
    b. Dummy variables
    c. Heteroskedasticity
5. Multiple regression model
    a. Hypothesis testing
    b. Introduction to projection matrices
    c. Multicollinearity
    d. Non-linearities
    e. Dummy variables
    f. Omitted variable bias, simultaneity and errors in variables
6. Instrumental variable estimation
7. Panel Data
8. Introduction to binary choice models
9. Maximum Likelihood Estimation
10. (Time allowing) Introduction to Time Series

Relevant Book Chapters:

Introduction to Econometrics: **Chapter 1 SW**, Chapter 1 MV, Appendix B MV

Reviewing Probability and Statistics: **Chapters 2 and 3 SW**

Introduction to Matrix Algebra: **Appendixes A1-A5** and A7-A8 MV

Simple Regression Model with one Regressor: Chapters 4 and 5 SW

Multiple Regression Model: **Chapter 2 MV, Chapters 6-8 SW,** Chapter 9 SW

Instrumental Variable Estimation: Chapter 12 SW, Chapter 5 MV

Panel Data: Chapter 10 SW, Chapter 10 MV

Introduction to Binary Choice Models: Chapter 7 MV, Chapter 11 SW

Maximum Likelihood Estimation: Chapter 6MV

Introduction to Time Series: Chapter 14 SW, Chapter 8 MV

Other interesting sources:

Matrix Algebra Useful for Statistics, by Shayle R. Searle, Wiley.

Online reference for Matrix Algebra (advanced) https://www.math.ucdavis.edu/~linear/linear-guest.pdf

Geometric interpretation of OLS:
http://www.geo.arizona.edu/xtal/geo460/Multiple%20Linear%20Regression.PDF