COURSE DESCRIPTION

This course introduces basic econometric tools that are used to build and estimate economic and financial models. The main techniques that are employed in economics are equally applicable for finance. Financial econometrics involves the application of theory and statistical techniques to build and test finance models and address issues relating to markets and how various financial variables are determined.

Specific topics covered include standard statistical techniques, estimation and inference; the Classical Linear Regression Model (“CLRM”) and Ordinary Least Squares (“OLS”) estimators and their properties; application of regression analysis for the (1) specification and estimation of an econometric model; (2) testing of the assumptions and implications of the model; and (3) forecasting.

Classes are conducted through lectures and discussions and use of PowerPoint notes. Lectures will emphasize problem solving to assure the comprehension of the materials covered. Lecture notes and solutions for end of chapter problems will be placed on Blackboard. The course will progress according to the Course Outline below.

COURSE MATERIALS

Textbook and Additional References

Required Textbook:
  [When you purchase a prior edition, you’ll have to make sure that the assigned end of chapter problems are the same.]

Additional References:
The textbooks you used in statistics and in finance should be useful references. Other useful references are:
Computer Programs:
There are quite a few statistical/econometric software packages available in the market, but the minimum requirement for our course is Microsoft Excel. However, you’ll find EView 7 Student Version useful and challenging.

Prerequisites: 220:101, 220:102, 220:231 (or equivalent)

Grading Policy

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>First Midterm Exam</td>
<td>10%</td>
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<td>Second Midterm Exam</td>
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<td>Final Exam</td>
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<td>Homework Assignments</td>
<td>10%</td>
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<tr>
<td>Group Project</td>
<td>15%</td>
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<tr>
<td>Class Participation &amp; Attendance</td>
<td>10%</td>
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* There are no opportunities for extra credit.

Exam Policy

Exams will cover materials from lectures. All exams will be closed book and closed notes. Students are allowed to bring a formula sheet, #2 pencils, pens, erasers, your Rutgers ID card, and a financial calculator.

Makeup policy: Students who simply do not show up for exams should not expect to be given a makeup. You should present a valid documentation in order to avoid receiving zero point on the missing exam.

Suggested Homework Problems

The most effective way to learn econometrics is through practice. On blackboard, you will find a list of end of chapter practice problems, which will be collected and checked your submission. Some of selected problems will be discussed in class to assure your understanding of the material and fine performance on the exams.

Group Project:

Form a team with three other members of the class, and think about a project for the semester. You may encounter econometric analyses in your other courses. If you don’t find an idea that strikes you, talk with me and we’ll find a project for you. Your team project will start by review the literature related to your topic. You’ll synthesize the literature to help formulate an economic model. You’ll then gather data, compile some descriptive statistics and estimate your econometric model.
Projects will be listed on Blackboard. Students need to submit written papers for grading and be ready to present and discuss their papers in class. Possible topics for empirical projects in this course include the following:

- Capital Asset Pricing Model (CAPM), and its application for the assessment of portfolio managers’ performance;
- Relationship between spot and futures exchange rates;
- Purchasing Power Parity (PPP) and the Low of One Price;
- The term structure of interest rate;
- The effect of earnings and dividend announcements on stock prices;
- Correlation between stock indices of two countries

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**Attendance and Courtesy**

Students are responsible for everything that is announced, presented or discussed in class, and are responsible for all work missed during an absence, no matter what is the reason for the absence. The way to make a good understanding associated with this course is to attend class. Attendance is required and there is a strong correlation between attendance and grades. We are all responsible for maintaining a classroom environment that is conducive to learning and discussion. We need to create a *respectful learning environment*:

- That the instructor and students notice and respect each other.
- Respect includes appropriate humor, enjoyment, or other indications of a comfortable and pleasant classroom community.
- We are on time for class: no late arrivals and no packing up early.
- We avoid disruptions during class such as private conversations, reading newspapers, use of a cell phone (make sure if it is turned off before the class), using a laptop for something other than current classroom work, and, of course, sleeping.

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**Academic Code of Conduct**

All students are expected to know, understand and live up to the standards of academic integrity and code of student conduct explained at

[http://judicialaffairs.rutgers.edu/academic-integrity](http://judicialaffairs.rutgers.edu/academic-integrity)
[http://judicialaffairs.rutgers.edu/university-code-of-student-conduct](http://judicialaffairs.rutgers.edu/university-code-of-student-conduct)

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**Tentative Course Outline**

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<th>Subject</th>
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<td>Appendix B</td>
<td>Characteristics of Probability Distributions</td>
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## First Midterm Exam

2. Basic Ideas of Linear Regression: The Two-Variable Model
   - Population regression equation
   - Sample regression equation
   - The ordinary least squares (OLS) method

3. The Two-Variable Model: Hypothesis Testing
   - Assumptions of the Classical Linear Regression Model
   - Estimation of the Regression Coefficients – Ordinary Least Squares (OLS) Method
   - Properties and Sampling Distributions of the OLS Estimators
   - Hypothesis Testing
   - Coefficient of Determination, $R^2$
   - Normality Tests

## Second Midterm Exam

6. Dummy Variable Regression Models
   - Nature of Dummy Variables
   - Interpretation of the Coefficients on Dummy Variables
   - Comparing Two Regressions: the Chow Test
   - Use of Dummy Variables in Seasonal Analysis
   - What if the Dependent Variable is a Dummy Variable

7. Model Selection: Criteria and Tests
   - Attributes of a “Good” Model – Types of Specification Errors
   - Tests of Specification Errors
   - Nested versus Non-Nested Models
   - Model Selection among Non-Nested Models

8. Multicollinearity: What Happens If Explanatory Variables are Correlated?
- The Nature of Multicollinearity
- Consequences of Multicollinearity
- Detection of Multicollinearity
- What To Do with Multicollinearity

9 Heteroscedasticity: What Happens If the Error Variance is Nonconstant?
- The Nature of Heteroscedasticity
- Consequences of Heteroscedasticity
- Detection of Heteroscedasticity
- Remedy of Heteroscedasticity
- White’s Heteroscedasticity-Corrected Standard Errors

Final Exam