ECO 4000 Statistical Analysis for Economics and Finance

Baruch College || Summer 2024

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| Instructor | Email | Class Schedule  |
| **Aman Ojas Desai** | adesai@gradcenter.cuny.edu (Email Hours: 8:30 PM to 9:30 PM)Office Hours: MoWeTh1:30 PM – 2:30 PM (B-Vert 10-275A) | Location: B - Vert 10-155 Time: MoWeTh 11:00 AM – 1:30PM |

## Course Description

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|  | The course introduces econometric techniques useful to conduct empirical analysis in economics and finance. The purpose of the course is to enable the student to master the concepts and be able to complete an independent empirical project.  |

**Enrollment Requirements**

STA 2000 or equivalent and ZICK or ZKTP Student Group and ECO-BA Plan or STA-BA Plan or FIN-BBA Plan or ECO-BBA Plan or ECO-MIN or ZKECOF-MIN Plan and with 45 credits.

**Learning Outcomes**

Firms, governmental or non-governmental agencies, regulators, experts, etc., all rely increasingly on data analysis to assess situations and take decisions. Statistical analysis and econometrics offer powerful tools that are easy to use but that need to be used properly. Interpreting correct results from statistical analysis is also paramount to the discipline.

By the end of the semester students will be able to:

* Handle data in a professional manner.
* Know how to use different statistical programs and know which one is the most appropriate for the type of study.
* Recognize the main pitfalls encountered in statistical analysis.
* Develop knowledge of the basic principles of probability and statistics
* Develop an understanding of the Linear Regression Model (LRM) and its use in modeling the relationship between economic and financial variables.
* Be able to estimate and test a hypothesis about the parameters of the LRM.
* Be able to conduct an empirical investigation using econometric techniques.
* Be able to present the results of statistical analysis.

# Course Materials

## We will be using Pearson MyEconLab as a primary mode of learning that the students can access online. Information on how to get the course access via MyEconLab is given in a separate pdf on Brightspace. The special package for Baruch students for this course also includes a free e-text.

## Recommended Books

* Introduction to Econometrics, 4th Edition (Pearson), by James Stock and Mark Watson. (SW)
* Introductory Econometrics: A Modern Approach, 6th Edition (Cengage), by Jeffery M. Wooldridge (W)
* Basic Econometrics, 5th Edition, by Damodar N Gujarati and Dawn C. Porter (GP)
* Introduction to Econometrics, 5th Edition (Oxford University Press), by Christopher Dougherty (CD)

**Important Dates**

(For the latest updates please follow: <https://www.baruch.cuny.edu/registrar/registration/academic-calendar.html>)

Mid-term Exam - Aug 1, 2024 (online)

Group Project - Aug 14, 2024 (in class)

Final Exam – Aug 15, 2024 (cumulative and in class)

**Course Evaluation Scheme**

MyEconLab Assignments – 30%

Midterm– 20%

Final Exam – 30%

Empirical Group Assignment – 20%

**Required Software**

We will be using MS-Excel to learn about the applications of the course concepts in class. In your final group project, you will be required to use MS-Excel to analyze the data.

**Policy Regarding Make-up Exams and Deadline Extensions**

Students are responsible for checking the assignment and exam dates and avoiding any conflict with other commitments. **There will be no make-ups for exams and assignments except only if:**

* The student has contacted the instructor ***before*** the deadline, and the instructor has agreed to organize a make-up exam (interviews or business trips do not constitute a valid excuse to have makeup).
* There are cases of documented serious illness, civic obligation, or an accident.

**Attendance and Lateness Policies**

Attendance will not be checked. It is the student’s responsibility to attend classes. Sometimes, some information that is relevant for the assignments and the final exam will be given during the class (information that will not be found in lecture notes, books, or other supports).

**Grading System**

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| Letter Grade | GPA | Grade (Over 100) |
| A | 4.0 | 93.0-100.0 |
| A- | 3.7 | 90.0-92.9 |
| B+ | 3.3 | 87.1-89.9 |
| B | 3.0 | 83.0-87.0 |
| B- | 2.7 | 80.0-82.9 |
| C+ | 2.3 | 77.1-79.9 |
| C | 2.0 | 73.0-77.0 |
| C- | 1.7 | 70.0-72.9 |
| D+ | 1.3 | 67.1-69.9 |
| D | 1.0 | 60.0-67.0 |
| F | 0.0 | below 60.0 |

**Counselling Service**

At Baruch, we acknowledge that as a student, you are balancing many demands. During the semester, if you start to experience personal difficulties or stressors that are interfering with your academic performance or day-to-day functioning, please consider seeking free and confidential support at the Baruch College Counseling Center. For more information or to make an appointment, please visit their website at <https://studentaffairs.baruch.cuny.edu/counseling/> or call 646-312-2155. If it's outside of business hours (Monday-Friday 9-5 pm) and you need immediate assistance, please call 1-888-NYC-WELL (888-692-9355). If you are concerned about one of your classmates, please share that concern by filling out a Campus Intervention Team form at  <https://studentaffairs.baruch.cuny.edu/campus-intervention-team>.

**Student Disabilities Service**

We have a process at Baruch for determining whether a student who identifies as disabled is eligible for reasonable accommodations to complete the student’s academic program. We strive to ensure that no student with a disability is discriminated against and that none is denied participation in college programs and activities for lack of reasonable accommodation.

Some people think that a disability must be visible to be accommodated. This is not the case. There are many disabilities – diabetes, psychological illness, learning disabilities, AIDS, seizure disorders, arthritis, etc., – that require accommodation.

Examples of accommodation include additional testing time; adaptive equipment; and taping of classes. If you feel that you may need reasonable accommodation based on a disability, please contact the staff at the Office of Disability Services, Newman Vertical Campus, Room 2-271, or by phone on (646) 312-4590.

**Academic Integrity**

I fully support Baruch College's policy on Academic Integrity, which states, in part:

"Academic dishonesty is unacceptable and will not be tolerated. Cheating, forgery, plagiarism, and collusion in dishonest acts undermine the college's educational mission and the student’s personal and intellectual growth. Baruch students are expected to bear individual responsibility for their work, learn the rules and definitions that underlie the practice of academic integrity, and uphold its ideals. Ignorance of the rules is not an acceptable excuse for disobeying them. Any student who attempts to compromise or devalue the academic process will be sanctioned. " Additional information can be found at [http://www.baruch.cuny.edu/academic/academic\_honesty.html[](http://www.baruch.cuny.edu/academic/academic_honesty.html%5B)

Students caught cheating will first receive a PEN grade and a report of suspected academic dishonesty will be sent to the Office of the Dean of Students. That grade will then be changed to an F grade (on top of the penalty decided by the Office of the Dean of Students).

**Coverage of Topics (tentative)**

Most of the course is aimed at offering an introduction to econometrics. Elements of probability and statistics that are needed will be introduced along the way.

1. **Review of Probability and Statistics**
2. **The Simple Regression Model**
	1. Definition of the Simple Regression Model
	2. Deriving the Ordinary Least Squares Estimates
	3. Properties of OLS
		1. Fitted values and residuals.
		2. Algebraic properties of OLS statistics
		3. Goodness-of-fit.
	4. Units of Measurement and Functional Form
	5. Expected Values and Variances of the OLS estimators.
3. **Regression Analysis: Inference**
	1. Hypothesis testing
	2. Sampling Distribution of the OLS estimators
	3. Testing hypothesis about a single population parameter
		1. Testing against one-sided alternatives
		2. Two-sided alternatives
		3. Computing p-values for t-tests
	4. Confidence intervals
4. **Multiple Regression Analysis**
	1. Motivation for Multiple Regression
	2. Mechanics and Interpretation of OLS
		1. Interpreting the OLS regression equation
		2. Meaning of ``holding other factors fixed''
		3. Changing more than one independent variable simultaneously
		4. Partialling out interpretation of multiple regression
		5. Comparison of simple and multiple regression estimates
		6. Goodness-of-fit
	3. Expected values of the OLS estimates
		1. Including irrelevant variables in a regression model
		2. Omitted variable bias
	4. Variance of the OLS estimators
		1. Components of the OLS variances, multicollinearity
		2. Misspecified models
	5. Efficiency of OLS
	6. Testing multiple linear restrictions; the F-test
5. **Multiple Regression Analysis with Qualitative Information:**
	1. Binary (or Dummy) Variables
	2. A single dummy independent variable
	3. Using dummy variables for multiple categories
	4. Interactions involving dummy variables.