ECO 255: Introduction to Statistics

John Jay College, Spring 2023
Tues-Thurs 4:30 PM – 5:45 PM
Class Location: New Building 7.61

Instructor: Thomas Herndon, Associate Professor, Economics
Email: therndon@jjay.cuny.edu
Online Office Hours: Tues 1:30 PM – 3:30 PM and by appointment
Online Locations:

- Zoom: https://jjay-cuny.zoom.us/j/5116324579
- Dropbox: https://www.dropbox.com/sh/e326sh11c86tl2t/AADAh62CsE7RwBRnlB4ikDM0a?dl=0
- Blackboard: Login via CUNYFIRST

Course Description: This is an introductory course in probability and statistics, which covers topics including descriptive statistics and data visualization, probability theory, estimation and the sampling distributions of estimators, inference, common distributions such as the normal distribution, ANOVA, and regression analysis. The goal of this course is for students to gain experience with using the core tools of probability and statistics in real-world settings, so students have a strong foundation for further studies or pursuing a career in data analysis.

Learning Outcomes:

- Gain experience analyzing and visualizing real world data
- Develop facility with analysis of quantitative relationships
- Develop strong foundation for further courses using data analysis in economics

Course Requirements: Student's grades will be based on fundamental exercises which are graded for completion (48%), two take home tests (32%), and a final (20%).

Fundamentals Exercises: Fundamentals exercises are short numerical exercises that teach students the fundamental elements and properties of the probability and statistical concepts we will examine in this course, and will serve as the basis for in class exercises. These exercises are designed to provide the structure for the consistent practice that is necessary to master the material, without having to worry about making a low grade. To remove fear of a low grade, fundamental exercises are only graded for completion, and each exercise is worth 4 points. To incentivize consistent practice, students are only allowed to submit a single fundamental exercise per week. There are 15 total weeks of instruction, so students will need to submit exercises for 12/15 weeks of the semester to receive full points for fundamentals.

I will provide a large number of fundamentals exercises over the semester. Students can select any of these exercises to turn in (even if they are from a previous topic), provided they have not already turned in that exercise. In addition, I will also provide comprehensive solutions to fundamentals exercises. Students can opt to submit a fundamental exercise that has already had solutions provided, however they will be required to transcribe the solutions verbatim 5 times (typed or by hand is fine). This will help students gain the repetitions needed to master the material.

Textbook: This course will use two primary textbooks, both of which are open source:

1) Floyd, John. Statistics for Economists: A Beginning
2) Holmes, Illowsky, and Dean. Introductory Business Statistics

We will also use an additional textbook to help us work through examples of these concepts in R

3) Kerns, Jay G. Introduction to Probability and Statistics Using R

In addition, we will supplement these books with additional readings, and other open source books where needed. These textbooks, supplemental readings, and all course materials will be available via the course Dropbox.

Attendance: Students are expected to attend class regularly, and to be active participants in class discussions. A few absences over the course of the semester will not reduce your grade, but it is your responsibility to inform yourself about the material covered on any days that you miss.

Provisional Course Schedule:

			Topics/Readings	**Readings/Notes**
Week 1	**26-Jan**	Thurs	Intro to Statistics, Data, and Statistical Thnking	Skim Floyd, Ch. 1/OIBS Ch.1; Read Lockhart's Lament
				Read IPSUR Ch. 2, and get R and Rstudio installed on your computer
Week 2	**31-Jan**	Tues	Describing, Displaying and Exploring Data	Floyd Ch. 1/OIBS Ch.2
		Thurs		IPSUR Ch 3
Week 3	**7-Feb**	Tues	Probability	Floyd Ch. 2, Ch. 3.1-3.6; Orloff and Bloom, 1-7, IPSUR Ch.2, IPSUR Ch.7.1-7.5
		Thurs		
Week 4	**14-Feb**	Tues	Probability Continued: Intro to Random Variables	Floyd Ch. 2, Ch. 3.1-3.6; Orloff and Bloom, 1-7, IPSUR Ch.2, IPSUR Ch.7.1-7.5
		Thurs		
Week 5	**21-Feb**	Tues	Discrete Probability Distributions	OIBS Ch. 4, Floyd 3.7-3.8
		Thurs		IPSUR Ch. 5
Week 6	**28-Feb**	Tues	Continous Probability Distributions	OIBS Ch. 5.2, Ch. 6; Floyd Ch. 3.9-3.10
		Thurs		IPSUR Ch.6; End of Section Take Home Test

Week 7	**7-Mar**	Tues	Sampling Methods and the Central Limit Theorem	Floyd Ch. 4.1-4.3; OIBS Ch. 7
		Thurs		IPSUR Ch. 8
Week 8	**14-Mar**	Tues	Estimation and Confidence Intervals	Floyd Ch. 4.4-4.11; OIBS Ch. 8
		Thurs		IPSUR Ch. 9
Week 9	**21-Mar**	Tues	One-Sample Tests of Hypothesis	Floyd Ch. 5; OIBS Ch. 9
		Thurs		IPSUR Ch. 10.1 - 10.3
Week 10	**28-Mar**	Tues	Two-Sample Tests of Hypothesis	Floyd Ch. 6; OIBS Ch. 10
		Thurs		IPSUR 10.4-10.5; End of Section Take Home Test
Week 11	**4-Apr**	Tues	Loose Ends Week - Wrap up loose ends before spring break	
		Thurs		
	11-Apr	Tues	SPRING BREAK NO CLASS	
		Thurs		
Week 12	**18-Apr**	Tues	Analysis of Variance	OIBS Ch. 12; Floyd, Ch. 10.2-10.3
		Thurs		IPSUR 10.6
Week 13	**25-Apr**	Tues	Correlation and Linear Regression	Floyd, Ch. 8. OIBS Ch. 13
		Thurs		IPSUR Ch. 11
Week 14	**2-May**	Tues	Multiple Regression Analysis	Floyd Ch. 9, OIBS Ch. 13
		Thurs		IPSUR Ch. 12
Week 15	**9-May**	Tues	Multiple Regression Analysis	Floyd Ch. 9, OIBS Ch. 13
		Thurs		IPSUR Ch. 12
Week 16	**16-May**	Tues	Last Day of Class	

FINALS WEEK	**17-23 May**	Thurs	Finals Week	

Course Policies

Americans with Disabilities Act Accommodations: Qualified students with disabilities will be provided reasonable academic accommodations if determined eligible by the Office of Accessibility Services (OAS). Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility from the OAS which is located at L66 NB (212-237-8031). It is the student's responsibility to initiate contact with the office and to follow the established procedures for having the accommodation notice sent to the instructor. For more info: http://www.jjay.cuny.edu/cuny-accommodations-policy

Wellness and Student Resources: Students experiencing any personal, medical, financial or familial distress, which may impede on their ability to fulfill the requirements of this course, are encouraged to visit the Wellness Center (L.68 NB). Available resources include Counseling Services, Health Services, Food Bank, and legal and tax aid through Single Stop. http://www.jjay.cuny.edu/wellness-resources

CUNY Policy on Academic Integrity

Students are encouraged to work together on all assignments, but must submit their own work. Please see the below guidelines for a fuller discussion of academic integrity.

Academic dishonesty is prohibited in The City University of New York. Penalties for academic dishonesty include academic sanctions, such as failing or otherwise reduced grades, and/or disciplinary sanctions, including suspension or expulsion. The complete text of the CUNY Policy on Academic Integrity can be accessed at: http://www2.cuny.edu/about/administration/offices/legal-affairs/policies-procedures/academic-integrity-policy/

Plagiarism:

Plagiarism is the presentation of someone else's ideas, words, or artistic, scientific, or technical work as one's own creation. Using the ideas or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

It is the student's responsibility to recognize the difference between statements that are common knowledge (which do not require documentation) and restatements of the ideas of others. Paraphrase, summary, and direct quotation are acceptable forms of restatement, as long as the source is cited. Internet plagiarism includes submitting downloaded term papers or parts of term papers, paraphrasing or copying information from the Internet without citing the source, and "cutting and pasting" from various sources without proper attribution.

Students who are unsure how and when to provide documentation are advised to consult with their instructors. The Library has free guides designed to help students with problems of documentation at: http://guides.lib.jjay.cuny.edu/citing_sources