

ECONOMICS 45: STATISTICAL METHODS

Fall 2020

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Instructor: Felipe A. Araujo	Time: Mo & Wed 10:45–12:00
Email: fad220@lehigh.edu	Place: Rauch Business Center 184

Course page: The official course page is on [Course Site](#). I will post problem sets—see last table for assignment dates—and answer keys. Lecture materials will also be posted there after our meetings, as well as any relevant communication.

Office Hours: Tuesday and Thursday 3:00–4:30 PM or by appointment. Office hours are online only. Here’s the link for the Zoom sessions: <https://lehigh.zoom.us/j/98222866199>.

Course Grader: Nicholas Mattioli (ndm319@lehigh.edu)

Course Overview and Requirements: This course focuses on developing an understanding of the basic tools of statistical analysis and learning how to apply them to a wide variety of situations and data encountered in the areas of business and economics. Topics include descriptive statistics, probability and probability distributions, sampling, estimation, hypothesis testing, chi-square tests, correlation and simple linear regression. By the end of this course, students should be able to do the following:

- Compute and interpret descriptive statistical measures;
- Understand basic concepts of probability theory, such as common probability distributions and probability rules;
- Comprehend and apply the basics of inferential statistics (estimations and hypothesis testing);
- Work with measures of statistical association such as correlation and linear regression.

Textbook and Software: The textbook used in this class is *Statistics for Business and Economics*, 14th edition, by Anderson, Sweeney, Williams, Camm, Cochran, Fry and Ohlmann. A calculator can be useful for solving problem sets. Note, however, that only a *non-programmable* calculator can be used during exams. As to statistical software, we will use Excel during class. The textbook provides an introduction to Excel in the appendix.

Grading Policy: Grades will be based on your performance on problem sets, two midterm exams and one final exam. The weights used to compute the weighted average score, based on which a letter grade will be determined, and the exam dates, are listed below. All exams are mandatory.

Grading components, dates, and weights

Grade Component	Date	Weight
Attendance	-	5%
Problem Sets	Weekly assignment	20%
Midterm #1	September 23 (75 min)	20%
Midterm #2	October 28 (75 min)	20%
Final Exam	December 11 (4–7pm)	35%

Numerical and letter grades

Score	Letter Grade
[92, 100]	A
[90, 92)	A-
[87, 90)	B+
[82, 87)	B
[80, 82)	B-
[77, 80)	C+
[72, 77)	C
[70, 72)	C-
[67, 70)	D+
[62, 67)	D
[60, 62)	D-
[0, 60)	F

Problem Sets: Problem sets will be graded using a 0–5 scale: 5 = Excellent (no major or minor errors); 4 = Good (only a few minor errors); 3 = Fair (some major errors); 2 = So-so (many major errors); 1 = Poor (very few correct answers); 0 = Not handed in or nothing correct. If you have a question about the grading of a particular problem or problem set, please first look at the solutions posted at Course Site and then write a note explaining your question. I will return it to the grader to give your answers another look. Only the best 9 out of 10 problem sets will be considered for the final grade. Here are some requirements on doing the problem sets:

- The problem sets should be worked out either by handwriting or typing, and will be submitted in electronic format on Course Site. Make sure it is neatly and completely and write your name on each page submitted;
- Show all the steps in your answer. You need to show me that you understand how and why your solution or response is correct. Minimal or no credit will be given for *only* the right answer;
- For any problem set you may use statistical software unless otherwise stated. Do *not* submit software output without a written explanation;
- Although you may consult with other students, the work which you hand in should be your own;
- In order for me to post answer keys at Course Site in a timely manner, please keep in mind that problem sets cannot be accepted after the due date. Please turn in your completed problem set via Course Site.

Midterm Exams: Two 75-minute midterms will be given in class during the semester. No make-ups will be given for the midterms. An absence from an exam will only be allowed in the case of a medical or other emergency. In such situations a note from the Dean of Students' Office is necessary. If one midterm is missed with valid reasons, the remaining graded work will have adjusted weights. An unexcused absence from the midterm exam will receive a zero score.

Final Exam: The final exam will be comprehensive. The date and location will be determined by the Registration & Academic Services. If you are unable to take the final at the designated time, then you must follow the procedures in the [Lehigh Student Handbook](#). No makeup finals will be given except on the official makeup day as determined by the Registrar.

Attendance: Attendance is mandatory and makes up 5% of the final grade. Most importantly, however, is that missing even one lecture can put you behind in a short time as the material naturally builds upon previous concepts.

Tutoring Options: [The College of Business Undergraduate Programs Office](#) helps coordinate tutoring options for students. It is best to seek out tutoring early in the semester and to continue to use it regularly for best results. No matter the GPA, tutoring is a way for students to take proactive action to ensure their success. The [Center for Academic Success](#) offers tutoring in most College of Business first-year and sophomore-level core courses free of charge to students.

The College of Business Undergraduate Programs Office publishes a [grid](#) outlining the various business tutoring options and times at the beginning of every semester. If you have any questions or concerns about tutoring, please contact Assistant Dean Emily Ford at eaf311@lehigh.edu.

Special Accommodations: Lehigh University is committed to maintaining an equitable and inclusive community and welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact Disability Support Services (DSS), provide documentation, and participate in an interactive review process. If the documentation supports a request for reasonable accommodations, DSS will provide students with a Letter of Accommodations. Students who are approved for accommodations at Lehigh should share this letter and discuss their accommodations and learning needs with instructors as early in the semester as possible. For more information or to request services, please contact Disability Support Services in person in Williams Hall, Suite 301, via phone at 610-758-4152, via email at indss@lehigh.edu, or online at <https://studentaffairs.lehigh.edu/disabilities>.

Lehigh Student Senate Academic Integrity Statement: "We, the Lehigh University Student Senate, as the standing representative body of all undergraduates, reaffirm the duty and obligation of the students to meet and uphold the highest principles and values of personal, moral and ethical conduct. As partners in our educational community, both students and faculty share the responsibility for promoting the helping to ensure an environment of academic integrity. As such, each student is expected to complete all academic course work in accordance to the standards set forth by the faculty and in compliance with the university's Code of Conduct."

The Principles of Our Equitable Community: Lehigh University is committed to diversity, inclusion and engagement (<https://www1.lehigh.edu/diversity>). Lehigh University endorses [The Principles of Our Equitable Community](#). We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment inside and outside the classroom.

Course Outline and Schedule: The table below details the complete class and assignment schedules as well as the topics covered and the relevant textbook sections.

Lectures and Assignments: Topics and Schedule

Date	Topic and Textbook Sections	Assignment and Due Date
Week 1	Data and descriptive statistics	
08/24	Ch. 1, sec. 1.1-1.6	
08/26	Ch. 2, sec. 2.1-2.3 (appendix 2.2, self-study)	PS #1 due 08/31
Week 2	Descriptive statistics	
08/31	Ch. 2, sec. 2.4-2.5; Ch. 3, sec. 3.1-3.2	
09/02	Ch. 3, sec. 3.3-3.5 (appendix 3.1-3.3, self-study)	PS #2 due 09/07
Week 3	Introduction to probability	
09/07	Ch. 4, sec. 4.1-4.3	
09/09	Ch. 4, sec. 4.4-4.5	
Week 4	Discrete probability distributions	
09/14	Ch. 5, sec. 5.1-5.4	
09/16	Ch. 5, sec. 5.5-5.7 (appendix 5.1-5.3, self-study)	PS #3 due 09/21
Week 5	Review session and midterm	
09/21	Review	
09/23	MIDTERM #1	
Week 6	Continuous probability distributions	
09/28	Ch. 6, sec. 6.1-6.2	
09/30	Ch. 6, sec. 6.3-6.4 (appendix 6.1-6.3, self-study)	PS #4 due 10/05
Week 7	Sampling distributions	
10/05	Ch. 7, sec. 7.1-7.5	
10/07	Ch. 7, sec. 7.6-7.7 (appendix 7.1-7.3, self-study)	PS #5 due 10/12
Week 8	Interval Estimation	
10/12	Ch. 8, sec. 8.1-8.2	
10/14	Ch. 8, sec. 8.3-8.4	PS #6 due 10/19
Week 9	Inference I: hypothesis tests	
10/19	Ch. 9, sec. 9.1-9.3	
10/21	Ch. 9, sec. 9.4-9.8 (appendix 9.1-9.3, self-study)	PS #7 due 10/26
Week 10	Review session and midterm	
10/26	Review	
10/28	MIDTERM # 2	
Week 11	Inference II: means and proportions	
11/02	Ch. 10, sec. 10.1-10.2	
11/04	Ch. 10, sec. 10.3-10.4 (appendix 10.1-10.3, self-study)	PS #8 due 11/09
Week 12	Experimental design and ANOVA	
11/09	Ch. 13, sec. 13.1-13.2	
11/11	Ch. 13, sec. 13.2-13.4 (appendix 13.1-13.3, self-study)	
Week 13	Linear regression I	
11/16	Ch. 14, sec. 14.1-14.2	PS #9 due 11/20
11/18	Ch. 14, sec. 14.3-14.5	
THANKSGIVING BREAK		
Week 14	Linear regression II	
11/30	Ch. 14, sec. 14.6-14.7	
12/02	Ch. 14, sec. 14.8-14.10	PS #10 due 12/07
Week 15		
12/07	Review session	
12/11	FINAL EXAM	