Intermediate Statistics

Section 1

Fall 2024

Instructor:	Mehul Rangwala	**Time:**	Saturdays 12:30 pm – 4:30 pm
Email:	mrangwala@ucdavis.edu	**Place:**	LL02

Q&A Sessions: I will be holding weekly Q&A sessions over Zoom every week. I will announce the schedule on Canvas. Additionally, I will also be available at the end of each class for discussion, if needed. I encourage in-person contact after the classes. Outside this, we can meet at a mutually convenient date and time.

Course Description: Students use statistical reasoning and techniques to draw appropriate inferences regarding the meaning of data. Topics include critical statistical thinking, chi-squared tests, nonparametric tests, simple and multiple regression, diagnostics, and the fundamentals of model building and its techniques. The course covers empirical strategies for applied micro-econometric research questions that include econometric and business applications of regressions.

Main References: This is a restricted list of various useful books that will be touched during the course. You can consult them occasionally.

- *Statistics for Management and Economics*, 12th edition by Gerald Keller. Publisher: Cengage.
- *Introductory Econometrics: A Modern Approach*, 7th edition by Jeffrey M. Wooldridge. Publisher: Cengage Learning ISBN-13: 978-1337558860 ISBN-10: 1337558869
- *Introductory Econometrics for Finance*, 4th Edition by Chris Brooks. Publisher: Cambridge University Press ISBN: 9781108436823
- *A Practical Guide to Using Econometrics*, 7th edition by A. H. Studenmund. Publisher: Pearson
- *Introduction to Econometrics*, 5th edition by Christopher Dougherty, Oxford University Press. ISBN: 978-0-19-967682-8
- *Basic Econometrics*, 5th edition by Damodar N. Gujarati and Dawn C. Porter, McGraw Hill Education. ISBN: 978-0073375779

Learning Objectives:

1. Gain an appreciation for the breadth of statistical topics available to solve complex business problems in real world and your practicum project.
2. Learn to identify correct statistical methods appropriate for business problems under consideration. Interpret the results and convey the interpretations in a non-technical manner to your audience.
3. Learn to use R for statistical analysis.
4. Be able to critically evaluate reports/articles/research containing statistical information.
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6. Prepare you for the advanced topics in the MSBA program.

Prerequisites: BAX-400: Foundations of Analytics

Tentative Course Outline*:

Date	Assignment due	Topics covered
09/28/2024		Chi-Squared Tests
10/05/2024	Homework 1	Basic Ideas of Linear Regression
10/12/2024		Multiple Regression
10/19/2024	Homework 2	Functional Forms
10/26/2024	Midterm exam (first 80 mins, in-class)	Indicator variables 1
11/02/2024		Indicator variables 2 Dealing with missing values
11/09/2024		Multicollinearity
11/16/2024	Homework 3	Regression Diagnostics 1
11/23/2024		Regression Diagnostics 2 Model building 1
12/07/2024	Homework 4	Model building 2 Nonparametric techniques
12/14/2024		Final Exam (in-class)

*The list of topics above is a tentative plan. I'm able to cover all the topics above every year. We will try our best to execute the agenda above according to the plan. However, depending on the pace of the class, we may need to adjust. If there are any adjustments needed, then I will keep you informed accordingly.

Grading Policy: Homework (Individual) (50%), Midterm (15%), Final (35%).

Important Dates:

Midterm exam (first 80 mins of the class) ..... October 26, 2024
Final Exam ..... December 14, 2024

Course Policies:

- Notes and solved example files will be available on Canvas under Files.
- `R` needs to be used for all homework assignments. Like in the foundations, all homework assignments need to be submitted as an HTML knitted file.
- Clerical scoring errors will be corrected without hassle, but for other re-grades you must hand back the work and send an email; the entire assignment will be subject to re-grading. You must submit any re-grading requests via email message within 5 calendar days from when the assignment is returned. In your message, you should clearly explain why you are requesting a re-grade. While I will consider the specific concerns cited in your message, I will re-grade the entire assignment. Your new score might be higher, lower, or the same as a result. Please remember that small changes in your grade on a single assignment might not affect your overall course grade.
- Assignments should be submitted on the date and time that they are due (as stated on each assignment.) Late assignments will be accepted with a 10% penalty per day and a score of zero will be awarded if submitted later than 4 days after the due date.
- The final exam will be closed-book, closed-notes, closed-computer, closed-internet, closed devices. The format of the exam will vary. There will be short-answer and multiple-choice questions testing your conceptual understanding of the concepts covered in the class. I will assess and decide if practice questions will be given or not. The homeworks and notes serve as key resources for preparation of the exam. Please note that the purpose of the exams is to assess your understanding of the concepts covered in the class. Working on homeworks is not mutually exclusive from preparing for the exams. If you understand the concepts covered, then it does not matter how questions are framed, you should be able to answer them. The questions won't necessarily be a replica of the homework questions. But I assure you that the questions will be based on the concepts covered in the class.
- Scantron forms will be provided for the multiple-choice part of the exam. Any scientific or graphing calculator is allowed. Please bring in pencils, an eraser, and your student ID number. Phones should be set to silent and placed on your desks face down.
- For short-answer questions, you can write in the space provided on the exam.
- The final exam will cover the concepts from BAX-400 AND BAX-441 since BAX-441 is a continuation of the foundations course in summer. The concepts covered in the foundations will be utilized and you are required to remember them. More weight will be placed on the BAX-441 topics compared to the BAX-400, but you will see questions from both courses on the final exam.

Class Policy:

- There is no grade for attendance this term. Attending all the classes is still mandatory and it would maximize your chances of success. Skipping classes, arriving late, and leaving early will prove to be detrimental to your performance.
- Please arrive to the class on time. Lateness could mean missed material and that would impact your learning and grades.

Honor Code and Academic Integrity: Academic integrity exists when students and faculty seek knowledge honestly, fairly, with mutual respect and trust, and accept responsibility for their actions and the consequences of those actions. Without academic integrity, there can be no trust or reliance on the effectiveness, accuracy, or value of a University's teaching, learning, research, or public service activities. It is, therefore, key that we understand what academic integrity is, why it is important, and how to help it flourish on college campuses.

1. It is expected that all class members treat each other with respect and dignity.
2. It is not acceptable behavior to insult, harass, or demean any member of the class.
3. Professional business behavior should be modeled in the classroom, including the use of appropriate language, jokes, or stories.

In general, students should adhere to the UC Davis Principles of Community, copied below.

The University of California, Davis, is first and foremost an institution of learning and teaching, committed to serving the needs of society. Our campus community reflects and is a part of a society comprising all races, creeds, and social circumstances. The successful conduct of the university's affairs requires that every member of the university community acknowledge and practice the following basic principles:

We affirm the inherent dignity in all of us, and we strive to maintain a climate of justice marked by respect for each other. We acknowledge that our society carries within it historical and deep-rooted misunderstandings and biases, and, therefore, we will endeavor to foster mutual understanding among the many parts of our whole.

We affirm the right of freedom of expression within our community and affirm our commitment to the highest standards of civility and decency toward all. We recognize the right of every individual to think and speak as dictated by personal belief, to express any idea, and to disagree with or counter another's point of view, limited only by university regulations governing time, place, and manner. We promote open expression of our individuality and our diversity within the bounds of courtesy, sensitivity, and respect.

We confront and reject all manifestations of discrimination, including those based on race, ethnicity, gender, age, disability, sexual orientation, religious or political beliefs, status within or outside the university, or any of the other differences among people that have been excuses for misunderstanding, dissension, or hatred. We recognize and cherish the richness contributed to our lives by our diversity. We take pride in our various achievements, and we celebrate our differences. We recognize that each of us has an obligation to the community of which we have chosen to be a part. We will strive to build a true community of spirit and purpose based on mutual respect and caring.

For more information, please review the Academic Conduct Booklet:
https://gsm.ucdavis.edu/sites/default/files/2020-10/code_of_conduct_booklet_2020.pdf