BAX-441 – 001 – Intermediate Statistics (Statistical Exploration and Reasoning)

TERM: Fall 2020

LECTURES: Friday: 5:10 p.m. – 8:00 p.m.
Online via Zoom

INSTRUCTOR: Mehul Rangwala mrangwala@ucdavis.edu

OFFICE HOURS: Mondays from 5:00 pm – 6:00 pm

COURSE DESCRIPTION: Students use statistical reasoning and techniques to draw appropriate inferences regarding the meaning of data. Topics include critical statistical thinking, ANOVA, nonparametric tests, and regression methods. The course covers empirical strategies for applied micro-econometric research questions that include econometric applications of regressions.

REFERENCE TEXTBOOKS:

1. *Statistics for Management and Economics*, 11e by Gerald Keller. Publisher: Cengage.

2. *Introductory Econometrics: A Modern Approach*, 7th edition by Jeffrey M. Wooldridge.
Publisher: Cengage Learning
ISBN-13: 978-1337558860
ISBN-10: 1337558869

3. *Essentials of Econometrics*, 4th edition by Damodar N. Gujarati and Dawn C. Porter.
Publisher: McGraw Hill
ISBN-13: 978-0073375847
ISBN-10: 0073375845

NOTES AND HANDOUTS: I will upload the notes and in-class exercises on Canvas.

COMPUTER PACKAGE: RStudio.

PEDAGOGICAL APPROACH: The class sessions will be interactive with lectures, discussions, and hands-on exercises/code walkthroughs. After I introduce a topic, we will work on cases and exercises related to the concepts covered in each class session. A laptop with RStudio installed is required.

GRADING:

Homework (Individual)	30%
Midterm (take-home)	30%
Final Exam (take-home)	40%

Course 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.

5. Prepare you for the advanced topics in the MSBA program.

Additional Points and Suggestions:

1. While there will be some focus on mathematical formulas, a significant proportion of time will be spent on intuition behind statistical techniques, analyzing *when* a particular technique should be used, and interpreting/understanding the results from the computer outputs. It is common for analysts to misapply statistical techniques to research problems. So, it is very important to be able to identify and choose correct methods to solve research problem under study.

2. The course textbooks are for reference and majority of the content will be drawn from the texts listed. However, this course will cover topics beyond those given in the textbooks. My lectures may not always follow the chapters in the text. For the most part, my lecture notes and the in-class exercises will be your key to complete the assignments and exams.

3. If you have difficulty with any material, please do not hesitate to contact me. My topmost priority is to ensure that you are successful in understanding of the material and prepare you for the rigorous coursework in the program.

4. The midterm and final exams will be computer-based and take-home. The formats of the midterm and final exams may be varied. Please note that the purpose of the exams is to assess your understanding of the concepts and your ability to apply concepts discussed in the class. The questions will involve problem sets and cases that will require statistical analysis. You will be required to perform quantitative and qualitative analyses for these cases.

5. Real learning has happened when you can explain the statistical concepts in your own words to people who don't understand statistics.

Academic Honor Code:

All students are expected to adhere to the University of California, Davis' Code of Conduct as noted here: http://sja.ucdavis.edu/files/cac.pdf.

Tentative Schedule on the next page

Schedule (Tentative)

This is a **tentative** schedule. It may be adjusted according to the pace of the class.

	Date	Assignments Due	Topics Covered
1	Fri 10/2/2020		Analysis of Variance (ANOVA) – Part 1 • One-Factor ANOVA • Post Hoc Analysis • Randomized Block Design
2	Fri 10/9/2020		Analysis of Variance (ANOVA) – Part 2 • Two-Factor ANOVA Chi-Squared Tests • Goodness of Fit test • Test of Independence
3	Fri 10/16/2020	Homework 1	Nonparametric Tests • Wilcoxon Rank Sum Test • Sign Test • Wilcoxon Singed Rank Sum Test • Kruskal-Wallis Test • Friedman Test • Spearman Rank Correlation Test
4	Fri 10/23/2020	Homework 2	Basic Ideas of Linear Regression • The Meaning of Regression • The Population Regression Function • The Sample Regression Function • Special Meaning of the Term "Linear" • Method of Ordinary Least Squares • Properties of OLS Estimators and Gauss-Markov Theorem • Inference in Simple Linear Regression
5	Fri 10/30/2020	Homework 3	Multiple Regression • Interpreting parameter estimates • Adjusted R-squared • Prediction • Partial F-test
6	Fri 11/6/2020	Midterm Exam Due	Functional Forms • Polynomial • Reciprocal • lin-log • log-log • log-lin

	Date	**Assignments Due**	**Topics Covered**
7	Fri 11/13/2020		Multicollinearity • Detecting and Remedying Dummy Variables – 1 • ANOVA and ANCOVA models
8	Fri 11/20/2020		Dummy Variables – 2 • Interaction Effects • Seasonal Analysis • Semilog Regressions
9	Fri 12/4/2020	Homework 4	Regression Assumptions • The Classical Assumptions • Normality • Heteroscedasticity • Autocorrelation
10	Fri 12/11/2020		Model Building • Model Selection Criteria and Tests • Variable Selection Techniques
11	Fri 12/18/2020 (Final)	Take-Home Final Exam Due	

GETTING GSM CAMPUS READY
SAN FRANCISCO CAMPUS - COVID SAFETY PROCEDURES

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Keeping our community safe and healthy will require patience, consideration and empathy. Welcome back to campus for a unique year. We are in it together and are here for you!

BEFORE YOU ARRIVE AT SAN FRANCISCO CAMPUS

Please assess how you are feeling. **DO NOT COME TO CAMPUS IF YOU ARE NOT FEELING WELL.** Err on the side of caution. Your professors and organization leaders will not penalize you for staying home.

While on campus and in the building, we expect you to follow these guidelines:

symptomsurvey.ucdavis.edu

- Wear a face covering at all times.
- Maintain social distancing of six feet from other individuals.
- Complete a Daily Symptom Survey (CAS login) prior to arrival. You can complete via a smart phone and is required to be on campus.
- Wash your hands frequently and use sanitizer. There are several hand sanitizer stations located throughout all campus buildings.
- Stay home if you are sick.
- Employees and students must report a COVID-19 diagnosis for themselves or someone with whom they share a residence. To report a positive case or concern, email reportcovid@ucdavis.edu. You may also visit the Campus Reporting website for more information.

As community members enter the San Francisco campus at 200 McAllister or 333 Golden Gate Ave, security will check your ID and that you have completed the screening survey with approved status. Do not come to campus if you are not approved as your health can adversely impact the health of others. There are two entrances to the facilities. UC Davis staff will pre-assign students to utilize the two entry points evenly to minimize the queue. You will need to show government-issued ID or a UC Hastings ID. Please allow plenty of time, as we expect lines. Security will provide a sticker showing your approved status to wear during your entire time on campus.

All guidelines follow Campus Policy 290-01. While in the building, please follow the safety signage posted throughout the building. Signage has been placed for your safety. We appreciate your cooperation to keep yourself and others safe. If you have any questions or concerns about COVID Safety procedures and protocol, please contact: **Amy Russel (atrussell@ucdavis.edu)**

MSBA Executive Director
(925) 487-9095 (cell)