UC San Diego
RADY SCHOOL OF MANAGEMENT

MGT 3: Quantitative Methods in Business

Course Syllabus—Spring 2021

Lectures: Thursdays, 5:00pm–7:50pm PST
Zoom ID (for Lectures only): 960-6950-7590 (also linked in Canvas)
Password: MGT3SP21

Midterm Exam: Thursday, May 6, 5pm PST (regular class time)
Final Exam: Thursday, June 10, 7pm–10pm PST

Ryan Wagner, Lecturer

Email: twagner@ucsd.edu ("T", not "R". My first name is actually Timothy)
Office Hours: Wednesdays, 6pm–7pm PST (via Zoom, same password as above.)

Ping-Chieh Huang, Teaching Assistant

Email: p9huang@ucsd.edu
Office Hours: TBA (via Zoom)

Course Description

This course aims to provide students with a foundation for working with common mathematical tools that support the business decision-making process. Students will gain a working proficiency with a set of analytic methodologies, with emphasis placed on how/when/why each approach is employed. A basic understanding of the mathematical principles underlying each technique, coupled with the ability to run the analyses independently, will better enable students to understand and employ these methods in a variety of business applications.

Course Objectives

At the end of this course you should be able to:

- Assess several types of common business questions through a quantitative lens: identify the various moving parts of a business scenario and formulate the system as a model.
- Understand the context in which the analyses discussed are(n't) appropriate. Given the question being asked and the data available to you, which (if any) of the tools at your disposal are appropriate?
- Use the R language to perform basic versions of the statistical analyses discussed.
- Interpret the results of these analyses.
- Translate the output of your analysis into a clear recommendation.
- Pursue more advanced courses on these topics.

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Course Materials

- The textbook for this course is ***Quantitative Methods for Business*, 13th Edition** (Anderson et al.), and is being offered through the Inclusive Access program. For further information and instructions for how to access the textbook, please see the 'Textbook Access' module on Canvas.
- R and RStudio, both free to download.
    - **R:** https://cran.r-project.org/ (see first section, 'Download and Install R')
    - **RStudio:** www.rstudio.com (Products > RStudio > RStudio Desktop > Download RStudio Desktop)

  These programs are not needed until Session 3; further instructions regarding installation will be posted on Canvas.

A Note on R

Although we will work regularly with R over the course of this class, and although R is technically a programming language, **prior programming experience (in R or any other language) is not a prerequisite for this course.** Why R? Many of the methods we will discuss require computer assistance in practice. Although a variety of options exist for this purpose (e.g., Excel, Stata, SPSS, MATLAB), the R language is a frontrunner in terms of power, popularity, and accessibility. R is one of the leading open source tools for statistical analysis, and has achieved widespread adoption among data scientists, researchers, and analysts in both academic and professional settings. In this course, we will not be "programming" in the traditional sense. You will be introduced to a variety of functions used to explore datasets and extract information from them. In terms of complexity, the code you will be asked to write is roughly equivalent to the code you might encounter in any other undergraduate quantitative social sciences course (e.g., econometrics, quantitative psychology.)

Grading Components

Component	Weight
Homework	30% (9 HWs, 3.33% each)
Midterm Exam	35%
Final Exam	35%

- In the very unlikely event that curving is deemed necessary, a curve will be applied to the final distribution of course grades, not to any individual course component.
- Letter grades are given +/- distinction for A-C grades. Using 'A' grades as an example, the ranges are as follows: 90-93% = A–, 94-96% = A, 97-100% = A+.
- Final course grades will be rounded to the percentage point (e.g., 89.5% becomes 90%.)
- Requests for adjustments to course grades for any reason other than a clerical error will be denied outright.
- **Two extra credit assignments will be offered.** Each extra credit assignment will be worth the equivalent of one regular assignment. See course schedule below for due dates.

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Course Schedule

Session	Date	Topic	Due
1	4/1	• Welcome / Syllabus / Introduction • Review: Fundamentals of Probability	NA
2	4/8	• Decision Analysis	HW #1
3	4/15	• Intro to R	HW #2
4	4/22	• Continuous / Discrete Probability Distributions	HW #3
5	4/29	• Bayesian Inference • Intro to Classification Modeling (Naïve Bayes)	HW #4
6	5/6	**MIDTERM EXAM**	HW #5
7	5/13	• Forecasting Methods	optional: EC#1 (no HW #6)
8	5/20	• Inventory Models	HW #7
9	5/27	• Optimization (Linear Programming)	HW #8
10	6/3	• Monte Carlo Simulation	HW #9
11	6/10	**FINAL EXAM**	HW #10 (optional: EC #2)

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Homework

Homework assignments will be posted on Canvas following each session. Assignments typically consist of problem sets, parts of which may require work in R.

Each completed assignment is to be submitted via the link provided in Canvas. **All homework is due by the start of the lecture on the date indicated in the schedule above.** Homework may be submitted late (one week max) for half credit. No credit will be given for assignments submitted more than one week past the stated due date. **Please note that you may not re-submit an assignment after its due date for any reason.**

All calculations must be done by hand (digitally "handwritten" work via a tablet is fine). R code and lengthy verbal responses may be typed. Completed assignments will typically consist of a mix of calculations, R code, and verbal responses; these should be neatly compiled in a single document.

Assignments must be submitted as a single PDF file, with a max file size of 5MB. Submissions violating these rules will not be graded until the file is correctly re-submitted; late penalties may be applied at my discretion.

Grades for each assignment will be posted in a timely manner. In an effort to protect the integrity of the assignments, I do not post solutions online. We are happy to discuss solutions during office hours.

Homework and exams are graded on accuracy (i.e., no points just for submitting.) **You must show your work.** For problems that reasonably require computation in order to solve, incorrect answers without work will receive no credit, and correct answers without work will only receive partial credit.

Course Policies

Excepting for students who require OSD accommodations and students in different time zones, exam dates and times are not flexible. Qualifying students must follow the appropriate channels in order to receive an accommodation (see 'Students With Disabilities' below). By continuing in this course, you are acknowledging and accepting the exam dates as given. Multiple exams in a single day, travel plans, and family requests are not sufficient reasons to request a separate exam date/time.

Like many of your courses, MGT 3 was originally built to be offered in-person, but has been converted to a virtual class due to COVID-19. Although I believe all wrinkles have been ironed out by now, I reserve the right to add or modify course policies at any time if deemed necessary. Your flexibility and patience are greatly appreciated.

Academic Integrity

Integrity of scholarship is essential for an academic community. As members of the Rady School, we pledge ourselves to uphold the highest ethical standards. The University expects that both faculty and students will honor this principle and in so doing protect the validity of University intellectual work. For students, this means that all academic work will be done by the individual to whom it is assigned, without unauthorized aid of any kind.

The complete UCSD Policy on Integrity of Scholarship can be viewed at:
http://senate.ucsd.edu/Operating-Procedures/Senate-Manual/Appendices/2

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Students with Disabilities

A student who has a disability or special need and requires an accommodation in order to have equal access to the classroom must register with the Office for Students with Disabilities (OSD). The OSD will determine what accommodations may be made and provide the necessary documentation to present to the faculty member. The student must present the OSD letter of certification and OSD accommodation recommendation to the appropriate faculty member in order to initiate the request for accommodation in classes, examinations, or other academic program activities. **No accommodations can be implemented retroactively.** Please visit the OSD website for further information or contact the Office for Students with Disabilities at (858) 534-4382 or osd@ucsd.edu.

Commitment to Equity and Inclusion

All students are welcome in this class. It is my responsibility and intention to ensure that equal respect and opportunity are afforded to all students, regardless of an individual's race/ethnicity, gender identity/expression, sexual orientation, socio-economic status, disability, citizenship, religion, or other identifying factor. As such, I commit to creating a course experience that is free from bias, discrimination, or harassment. Under no circumstances will I tolerate expressions or actions that demean another student, on the basis of these identities or otherwise. I acknowledge that the current circumstances may have disproportionately affected the physical and emotional well-being of certain students, particularly members of the BIPOC community, and I encourage you to engage with me in dialogue if at any time you feel this course is falling short of my commitment to you.

Title IX

The Office for the Prevention of Harassment & Discrimination (OPHD) provides assistance to students, faculty, and staff regarding reports of bias, harassment, and discrimination. OPHD is the UC San Diego Title IX office. Title IX of the Education Amendments of 1972 is the federal law that prohibits sex discrimination in educational institutions that are recipients of federal funds. Rady students have the right to an educational environment that is free from harassment and discrimination.

Students have options for reporting incidents of sexual violence and sexual harassment. Sexual violence includes sexual assault, dating violence, domestic violence, and stalking. Information about reporting options may be obtained at OPHD at (858) 534-8298, ophd@ucsd.edu or http://ophd.ucsd.edu. Students may receive confidential assistance at CARE at the Sexual Assault Resource Center at (858) 534-5793, sarc@ucsd.edu or http://care.ucsd.edu or Counseling and Psychological Services (CAPS) at (858) 534-3755 or http://caps.ucsd.edu.

Students may feel more comfortable discussing their particular concern with a trusted employee. This may be a Rady student affairs staff member, a department Chair, a faculty member or other University official. These individuals have an obligation to report incidents of sexual violence and sexual harassment to OPHD. This does not necessarily mean that a formal complaint will be filed.

If you find yourself in an uncomfortable situation, ask for help. The Rady School of Management is committed to upholding University policies regarding nondiscrimination, sexual violence and sexual harassment.

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