Syllabus

MGT 100: Customer Analytics

Summer 2023

Instructors

The professor for this course is Dan Yavorsky. Dan holds an MBA and PhD from UCLA Anderson and has over 10 years of experience applying econometrics and customer analytic techniques at consulting firms, including Bain & Company. He is currently a Senior Vice President and the Head of Analytics at GBK Collective, a marketing strategy and consumer insights firm.

Dan Yavorsky
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- bio: GBK bio | website | linkedin

The TA for this couse is Prachi Bhalerao. Prachi has worked for EY and Deloitt Consulting, and is finishing her Master Degree in Business Analytics at UCSD Rady. She has TAed this course in the past and is generally an awesome human.

Prachi Bhalerao
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Logistics

Schedule

We meet Wednesdays and Fridays from 11:00am – 1:50pm.

- Wednesday class sessions (Aug 9, 16, 23, 30 and Sep 6) will be held over Zoom. You must be logged in to Zoom with your UCSD account to join. Zoom link (ID: 999 9065 8444)
- Friday class sessions (Aug 11, 18, 25, and Sept 1, 8) will be held in person in Room 1S114 of Otterson Hall. I encourage you to attend in person.

All lectures will be recorded and posted on Canvas (assuming no technical difficulties).

Piazza

We will use Piazza as the primary method of Q&A: link

Materials

All materials for this course are on (or linked from) Canvas. Materials include slides, R code scripts, and readings. For the required readings, we rely solely on freely-available books, articles, blogs, and visualizations, including the books *R for Data Science* by Wickham and Grolemund and *Discrete Choice Methods with Simulation* by Train.

This course was co-designed with Professor Ken Wilbur. Materials for his version of the course are available online at https://kennethcwilbur.github.io/mgt100/

Course Introduction

Customer Analytics is the use of customer data to improve business decision-making. These data are often combined with economic theory and/or statistical modeling in pursuit of optimal managerial policies.

Our primary goal is to introduce students to data-driven business decision making. We also aim to enable students to execute – and interpret the output from – analytic techniques whose results inform those decisions.

In pursuit of those goals, our course design principles are *experiential* learning and assessment of applications. Half our time will be spent discussing key concepts in customer analytics. The other half will be spent coding to implement those ideas. Our mentors instilled in us the idea that "you don't understand it until you code it," and we, in turn, aim to propogate this belief with the next generation of scholars.

Implementation will all be done in the programming language R. R is free and originally designed with data analysis, data visualization, and modeling in mind. We will focus on the set of R commands and graphics capabilities provided by the Tidyverse set of R packages, given their effectiveness, widespread popularity, and ease of adoption.

Each week we will include a lecture followed by a coding demonstration. During the demonstration, we will step through an R code script to implement techniques from that week's lecture. Each week's homework will require students to revise the class script to accomplish a similar task. Homeworks will be collected, but not directly assessed. Instead, students will complete a mini-quiz each week that covers the assigned readings and results from the homework. There is no midterm; there will be a final exam.

We seek to simulate a professional experience within the classroom and therefore require no memorization, encourage collaboration, and will ensure extensive time and resources to complete deliverables.

We rely on free materials and provide pointers for students interested in deeper learning; we utilize free open-source software; and we use data on a set of customers from a single product category to demonstrate complementarities between analytic techniques.

This course was designed from scratch by UCSD faculty for quantitative UCSD students. It serves as a core course in the joint Econ/Rady Business Economics major and as an alternate core course in the Business and Marketing minors.

Most students will need to commit approximately 6–12 hours per week outside of class to have a successful experience. We may need to modify our terms and expectations as we proceed. Student feedback may be required to make appropriate adjustments.

Topics

We plan to cover the following topics in the order listed. Please see the associated Canvas module for each week/topic to find related materials and more information.

1. Introduction to Course & R
2. Customer Data & Data Visualization
3. Market Segmentation
4. Market Mapping
5. Demand Estimation
6. Heterogeneous Demand Estimation
7. Price Optimization
8. Branding
9. Customer Lifetime Value
10. Customer-based Corporate Valuation
11. Take-home Final Exam

Assignments and Grading

Your grade is composed of 2 types of evaluations:

- homework and quizzes (60%)
- final exam (40%)

Homeworks and Quizzes: Prior to each class session except the first, there will be a quiz. The quiz questions will cover topics and ideas from that week's assigned readings, and require you to submit results from the homework. The homework assignments ask you to implement (on data with code) the techniques demonstrated in class, and consider the resulting insights learned about the product, market, or customers. As part of the quizzes, you will submit your R scripts demonstrating completion of the homework. Those scripts will not be directly evaluated; they may, however, be reviewed to ensure active engagement with the material, to award partial credit, and to ensure honest, individual effort (i.e., to check for plagerism).

Midterm: There is no midterm.

Final Exam: There will be a final exam. It will assess comprehension of the readings, require understanding the material presented in the lectures, and draw heavily from the assigned homework. The main way to take the final exam will be in person on Saturday September 9th in our usual classroom from 11:30am – 2:30pm. The in-person final exam is expected to take 1 hour to complete, but the classroom will be available for the entire 3-hour window. For students unable to take the exam in person, an online final exam will be available. The online final exam is expected to take you 3 hours to complete. Other details about the online final exam will be announced toward the end of the quarter. To be clear, you do not need to take both final exams: you should plan to take the in-person final exam and only if you are unable to take that exam, then you should take the online final exam.

Curve and Bonus: The median grade will be curved to a B+. A collective bonus will be applied if more than 80% of SET evaluations are completed.

Course Policies

Attendance: We strongly recommend regular attendance and participation, but we will not formally assess them. It is imperative to keep pace with the course and not fall behind. You should proactively anticipate and manage issues you might experience in balancing your efforts across courses or other obligations.

Late Enrollment: Students who add the course after the first lecture are individually responsible for immediately catching up on all class content and deliverables.

Collaboration: All assignments except the final exam may be worked on in collaboration with other students. Collaboration is optional and groups should be small. Each student is individually responsible for submitting their own answers and code.

Contacting Instructors: Please use Piazza as the primary method contact the professor and/or TA. Post questions about course content and homeworks publicly so that both the instructors and other students can provide answers. For matters that pertain to you individually (illness, questions about grading, etc.) please use the "private message" feature of Piazza. Only if your Piazza questions are not answered in a timely manner, you may email the instructor and cc the TA (or vice-versa); do not email us separately.

Class Participation: Some letter grades may be adjusted based on class contributions. An example of a positive contribution would be helping to consistently move the class discussion forward. Examples of negative contributions include distracting others and nonconformance to course or classroom norms.

Use of AI Technology: You may use AI technology (e.g. ChatGPT) to help you develop an understanding of a topic or complete an assignment, in much the same way that you may use online search (e.g. Google

and Bing) and online information sources (e.g. Wikipedia or StackOverflow). Recognize, however, that you are responsible for the content of your work and that you must be able to explain and defend the content of your submissions. It is plagerism and a violation of UCSD Policy on the Integrity of Scholarship to copy work created by someone else (or someone else's technology) and pass it off as your own. Relevant additional information is available in the FAQ of academicintegrity.ucsd.edu (link).

Late Submissions: Late deliverables will only be accepted in grave circumstances with documentation, such as serious illness or death in the family, with some form of notification required prior to the deliverable due date.

Re-grade Requests: Any request for regrading must be made in writing within two weeks of a deliverable being assessed but before final course grades are submitted to the Registrar. The professor and/or TA will entirely regrade any such deliverable, meaning that the resulting grade change may be positive or negative, depending on the specifics of the situation.

Important UCSD Topics

Academic Integrity

Academic Integrity is expected of everyone at UC San Diego. This means that you must be honest, fair, responsible, respectful, and trustworthy in all of your actions. Lying, cheating, or any other forms of dishonesty will not be tolerated because they undermine learning and the University's ability to certify students' knowledge and abilities. Thus, any attempt to get, or help another get, a grade by cheating, lying, or dishonesty will be reported to the Academic Integrity Office and will result in sanctions. Sanctions can include an F in this class and suspension or dismissal from the University.

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.

You can learn more about academic integrity at:
https://academicintegrity.ucsd.edu/

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

All aspects of the UCSD honor code apply in this course. If you are ever unsure how they apply, please ask your classmates, TA, or professor for clarification. It is much better to be conservative about honor code violations than to take a risk. You can be suspended or expelled for cheating.

Students with Disabilities

A student who has a disability or special needs 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 instructor and OSD liaison.

Students requesting accommodations for this course due to a disability must provide a current Authorization for Accommodation (AFA) letter (paper or electronic) issued by the OSD. Students are required to discuss accommodation arrangements with instructors and OSD liaisons in the department 72 business hours in advance of any exams or assignments. No accommodations can be implemented retroactively.

Please visit the OSD website https://osd.ucsd.edu/portal/tutorial.html for further information or contact the Office for Students with Disabilities by phone at 858-534-4382 or via email at osd@ucsd.edu.

NonDiscrimination Policy Statement

The University of California, in accordance with applicable Federal and State law and University policy, does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, pregnancy, physical or mental disability, medical condition (cancer-related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services. The University also prohibits sexual harassment. This nondiscrimination policy covers admission, access, and treatment in University programs and activities.

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.

You can make a complaint of harassment or discrimination – or simply make an appointment to find out more information – by contacting OPHD:

- by phone at 858-534-8298

- by email at ophd@ucsd.edu

- or online at the Overview for Students webpage

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.

Health and Well-Being

Throughout your time at UC San Diego, you may experience a range of issues that can negatively impact your learning. These may include physical illness, housing or food insecurity, strained relationships, loss of motivation, depression, anxiety, high levels of stress, alcohol and drug problems, feeling down, interpersonal or sexual violence, or grief.

These concerns or stressful events may lead to diminished academic performance and affect your ability to participate in day-to-day activities. If there are issues related to coursework that are a source of particular stress or challenge, please speak with your professors so that we are able to support you. In addition, UC San Diego provides a number of resources to all enrolled students, including:

- Counseling and Psychological Services: 858-534-3755 or caps.ucsd.edu

- Student Health Services: 858-534-3300 or studenthealth.ucsd.edu

- CARE at the Sexual Assault Resource Center: 858-534-5793 or care.ucsd.edu

- The Hub Basic Needs Center: 858-246-2632 or basicneeds.ucsd.edu