Customer Analytics Syllabus

UCSD MGT 100

March 24, 2026

Faculty

Professor: Kenneth C. Wilbur, Brief biography
Office hours: Fridays, 11:00-12:00pm on Zoom
Brief intro: Ken joined UCSD in 2013. He helped to create the Business Economics major, the Marketing minor, and the Business Analytics minor.

Instructional Assistants:

Monday 2pm section: Zehong Zhao, LinkedIn
Office hours: Tuesday 2:00-3:00pm on Zoom
Brief intro: Zehong is a Ph.D. student in Mathematics studying machine learning, and previously majored in Math-Econ. He has been at UCSD for ten years.

Wednesday 2pm section: Kohei Hayashida, Website
Office hours: Thurs 4:00-5:00pm on Zoom
Brief intro: Kohei is finishing his Ph.D. in Quantitative Marketing and has written papers about demand estimation, pricing, and how retailers can reduce food waste. He will join University College London as a Lecturer in 2026-27. (Congrats, Kohei!)

Wednesday 5pm section: Radin Nadi, LinkedIn
Office hours: Thurs 5:00-6:00pm at Zoom
Brief intro: Radin took MGT 100 as an undergraduate in spring 2025, and is now completing the Rady MSBA program.

To contact any of us, post to 'All Instructors' on Piazza. Please do not use email or Canvas messages.

Welcome

We welcome everyone to this course. We are glad that you are here and that we get to work with you. We want you to learn and we want you to succeed. We will work hard to help make that happen. We will need you to participate actively, invest time and effort to learn this valuable material, and know that we have good intentions toward you.

Past experiences show that some students love this class, and that the class is more challenging for most students than most other classes. We cover technical material, quickly. The

most important thing to support your learning is to ask questions–during class, which we encourage and reward, on Piazza, or during office hours.

Student learning styles differ and no single approach is best for everyone. Also, anyone can go through a difficult time. Please tell us if you have trouble learning in this environment. As instructors, we all have experienced difficult challenges when we were students, and we can empathize with your situation. We will try to make suggestions, connect you with resources, or find appropriate accommodations. We will work with you as best we can.

Course Navigation

The course outline, slides, readings, data, code scripts and class recordings are on the MGT100 GitHub site. Please visit the site now to review our schedule for the quarter. Bookmark the site. We will post and revise materials frequently throughout the quarter. The website will always have the latest versions.

We will use Piazza for all asynchronous class discussion. Piazza is fantastic for answering questions quickly, efficiently, and accurately. If you have not used Piazza before, we think you will like it: You will find answers to questions you haven't even formulated yet. We have been using Piazza for many years now. Here is how we use it:

- Piazza posts about class material or class policies should be public by default. This ensures that all students can access all shareable information. Post authors may remain anonymous to classmates if they prefer. If Post authors create private posts about class material or class policies, Instructors will change the setting to public, so that all students can access the same information.

- Post private messages to **All Instructors**, not any individual instructional team member. We work as a team to ensure consistency, so we require all messages to be available to all instructional team members. We will check Piazza daily on weekdays, but may be slower on weekend days.

- We promise that Piazza answers will be fastest. If you send email or canvas messages, we will ask you to kindly post to Piazza before we reply. We are serious about this. Please use Piazza first.

- Please always remember that there are humans on the other side of the screen, and that they have good intentions toward you. Please communicate on Piazza as you would in person: with patience, kindness and respect toward others. Please assume the best intentions about others' questions and answers. Please use the best intentions when writing your own questions and answers. Please refrain from sarcasm or other message styles that may be easily misconstrued without contextual clues such as facial expressions.

We welcome you to office hours to get acquainted and for conversations. Office hours at UCSD are generally underutilized; please come, meet us, make yourself known. Past students have sometimes asked when to visit office hours and when to use Piazza, so here is a good

rule of thumb: if your question might lead to more questions, visit office hours; if not, then post on Piazza for a faster answer. (Of course, Piazza can also be used for iterated questions when needed.) We meet students in the order they arrive at office hours. We do not require or offer appointments.

Canvas is used primarily for assignments, competitions and grades. Not much else.

Course Introduction

Businesses exist to serve customers profitably. The first law of Customer Analytics is: No customers, no business. Customers have agency and may decline to purchase. Therefore we have to understand customer needs in order to attract customers and serve them profitably.

Customer Analytics are empirical frameworks that use customer data to improve business decisions–especially decisions related to acquiring customers, serving customers, developing customers, and retaining customers.

Unfortunately, customer data do not contain everything a business would like to know. For example, customer data often exclude direct measures of individual customer needs, willingness to pay, ability to pay, post-purchase satisfaction, and likelihood to churn; and also exclude important observations such as unserved potential customers. Therefore customer data are typically augmented with domain knowledge, theoretical assumptions, and statistical models to inform and improve business policies.

This course has three primary **learning objectives**:

1. Expose students to a broad base of customer analytics techniques.

2. Develop student understanding of theory and practices related to customer analytics and marketing.

3. Develop student ability to use customer analytics to improve data-driven business decision-making.

MGT 100 is designed as a survey course: We cover a broad range of topics in limited depth. We also have a deeper through-line that investigates demand modeling and demand model usage for decisionmaking, as this is a particularly valuable skillset in industry. The survey nature of the course is more typical of graduate business classes than most technical undergraduate classes–we focus primarily on what we can accomplish, what it can do for us, and how to do it, rather than the deep foundations of why something works or what fundamentals are required to deeply understand its operation. Therefore, the learning experience may feel unfamiliar. An advantage of a broad survey course is coverage of many different topics, enabling students to identify topics that interest them for deeper study, and we offer numerous pointers to self-study opportunities. However, breadth always competes with depth due to time and attention constraints.

Recent students indicated they studied an average of 5-7 hours per week outside of class, substantially more than most similar classes. Please consider this when choosing classes and do not overcommit yourself.

We believe that "you don't know if you understand it until you code it." We will code in R. R is free, popular, and originally designed for data visualization and modeling. We will use base R and a set of R packages that are collectively known as the "Tidyverse." The Tidyverse suite is effective, popular, especially good for collaboration, well-maintained, well-documented and easier to adopt than many alternatives.

MGT 100 was originally designed here, by UCSD faculty for quantitative UCSD students. It is a core class in the Business Economics major and minor, and an alternate core class in the Business and Marketing minors. Its content is shared freely and has been adopted at other universities.

In each class, we will discuss key concepts, walk through a script to implement selected techniques using code and data, and then run a competition to apply a key technique to a class dataset.

Assessments

All grades are curved and therefore relative, not absolute.

If at least 70% of students complete course evaluations, then final grades will be curved to a 3.4 average; if not, then grades will be curved to a 3.1 average.

Your grade is based on your **rank** within the section. For example, a rank of 20 means you ranked ahead of 20% of your classmates, and behind 80% of your classmates. Ranks will determine letter grades as follows:

| Evals below < 70%: avg = 3.1 | | Evals above ≥ 70%: avg = 3.4 | |
Grade	Rank	Grade	Rank
A+	95–100	A+	95–100
A	80–95	A	65–95
A−	62–80	A−	45–65
B+	48–62	B+	30–45
B	33–48	B	18–30
B−	21–33	B−	10–18
C+	12–21	C+	5–10
C	5–12	C	2–5
C− or below	< 5	C− or below	< 2

Please note, these ranks refer to performance scores relative to classmates. They do not refer to percentage correct, or any other absolute performance measures.

Ranks are based on weighted performance in 3 categories:

- Contributions (20%)
- Midterm 1 during week 4 (30%)
- Midterm 2 during week 10 (50%)

Please note: *there is no final exam.* We will be finished after week 10.

Contributions: Business teams meet regularly and expect regular contributions from all team members. Contributions to team discussions are a primary criterion in performance evaluations. If you don't say anything, managers may assume that you have nothing to say and evaluate you negatively. We will help you prepare for such environments by encouraging and rewarding your contributions within this class.

Ways to earn contribution points:

1 pt.   **Make yourself known**. Do <u>all</u> of the following (per class meeting):

- Arrive on time, or no later than 5 minutes after
- Sit in the first four rows and use a name tent that boldly prints your preferred first name on both sides, so Professor and IA can both read it from a distance.
- Single-task, do not distract others, answer questions when called upon
- Stay for the entire class meeting.

These are minimum expectations in professional environments. No partial credit is available.

1-5 pts.   **Contribute**. Make 1-3 meaningful, on-topic contributions to a class discussion. Ask a question, make a comment, relate a relevant experience, challenge the instructor; anything that authentically helps to deepen the topical conversation, helps you learn, or could benefit other students. Negative contribution points are also possible, for example, by changing the subject of the discussion or using AI to generate inauthentic comments (it has happened).
IAs and professor will collaborate to finalize contribution scores immediately after each class meeting. Contribution and Humor points can only be awarded to those using name tents in the first four rows, as that enables tracking.

1-5 pts.   **Humor**. Make an on-topic joke, without tearing anybody down.

1 pt.   **Enter a competition.** Competitions will ask you to write code to practice core skills. Submit a valid entry via Canvas. 1 point per competition entered. Language model assistance is explicitly allowed.

10 pts.   **Win a competition.** Each competition will feature up to 5 winners whose entries were judged to be the best among the submitted work. Winning

one competition generates 10 points. We will share some winning entries on Piazza as examples of good work.

1 pt.   **Complete an assignment.** Assignments are required submissions. They will be posted on Canvas. Language model assistance is explicitly allowed.

10 points   **Contribute on Piazza** Finish the quarter in the top 10% of students in terms of instructor-endorsed Piazza contributions.

Note that we do not grade attendance per se–you get the same score if you miss class as you would get if you attend class without making yourself known. **You do not need to notify us if you miss class.** We will videorecord every class session and post class recordings on the MGT 100 github site by thursday of the same week. We expect students to watch the class video for any session they miss.

Midterms: Each midterm will consist of two parts. One part is a quiz to test your understanding and ability apply key class concepts, using short-answer and multiple-choice questions. Quizzes will be taken in the Computer-Based Testing Facility (CBT) in the Applied Physics & Mathematics building, Level B. Please familiarize yourself with CBT procedures. You can schedule appointments to take the midterms at your convenience during weeks 4 and 10. The quizzes will be closed-notes, last up to 45 minutes, and will require identification. You should schedule a practice during weeks 1 or 2 to gain familiarity with the CBT and its policies.

The other part will involve a take-home coding exercise. You will apply a customer analytics framework to data to make data-driven decisions. Language model assistance is allowed. In-class competitions will be good preparation for the midterm coding exercises.

Late submissions will be penalized, and not accepted after grades have been returned. Missing submissions will get zeros. Please plan ahead to ensure you complete midterm components on time.

Course Policies

Late Enrollment: Students who add the course after week 1 are individually responsible for catching up on all class content. Make sure you watch videos for any class you missed. Please catch up quickly so you do not fall behind.

No switching sections: We cannot authorize cross-section attendance due to space limitations. Video recordings will be posted for all class meetings.

Office hours: Please attend any IA office hours that are convenient for you.

Re-grade Requests: Any request for regrading must be made in writing on Piazza, to 'All Instructors', within one week of a deliverable being returned. The professor and IA team will reconsider every aspect of the grade, meaning that any resulting grade change may be

positive or negative, depending on what we find. If we discover a flaw in the grading rubric, we will regrade all quizzes using the corrected rubric.

Software: We will use R and Rstudio. Both are free. Install R first from cran.r-project.org, then install Rstudio from here. Choose the installer for your operating system. Once installed, open Rstudio (not R directly) and run
`install.packages("tidyverse")` in the console to install the suite of packages we will use throughout the course. If you run into trouble, post on Piazza. You should do this before our first class meeting and bring your laptop to class. (You may optionally use Positron, a fork of VS Code that handles both Python and R, and incorporates some popular features from RStudio, and is gaining popularity.)

What Constitutes Academic Integrity in this Class?

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 words and 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 may result in sanctions. Sanctions can include a failing grade in this class and suspension or dismissal from the University. 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`.

A common question about the honor code relates to permissible uses of language models or coding agents. We encourage you to use these tools for our class competitions and our midterm coding exercises. We caution you against letting these tools perform work on your behalf; they are valuable supplements to human effort, but poor substitutes for human effort. Their output tends to reflect the critical thinking and effort that goes into their inputs.

Another common question is about individual responsibility. In this class there are NO GROUP ASSIGNMENTS. Each student is individually responsible for all deliverables. If any student's submitted code or output exactly matches another student's code or output, that will be considered to be an academic integrity violation. We will run automated checks for this.

Recall that all performance assessments are relative, not absolute. You may perform adequately, but still rank low if many peers performed better than you did. If you share quiz questions or code that helps someone else perform better, you may enable them to outperform you, hence directly lowering your rank. Further, if they share your help with a larger group–as often happens–you may thus enable multiple people to outperform you and thereby lower your rank further.

Please ask if you have any question related to how Academic Integrity applies in this course.

It is much better to be conservative about honor code violations than to take a risk. Please notify us if you observe any potential Academic Integrity violation and include sufficient detail to enable reporting. We take this seriously because the university's reputation, and the future value of your degree, relate to our collective integrity and treatment of integrity violations.

Frequently Asked Questions

Why R? Students often ask why they should learn R if they already know Python, or why we code in R. R and Python overlap in some areas, and each language can call the other's packages; each is currently better than the other for certain important functions. We view R as a great supplement to Python. Python is a general-purpose language and the most popular language for many data cleaning, data engineering and machine learning tasks. R is a specialist language designed for data visualization and modeling, and is better than Python for those purposes. Both are open-source, free and widely taught, helping to explain their popularity. This class will focus more on visualization and modeling, which is why we choose R as the right tool for the job. The R/Python distinction is like sportscar/truck: overlapping basic functionality, numerous common features, but relative performance depends on the task such as hauling furniture or winning a race. If you want to work in analytics then you should learn both Python and R. You should learn other languages also, as acquiring language proficiency is an important skill in its own right, and a successful career will involve frequent skill acquisition and retooling, as the analytics frontier is always moving.

Where can I get more of this? If you like MGT 100, then consider the Business Analytics minor or the Marketing minor. MGT 103 covers many similar topics in a more traditional pedagogical style focused on theoretical and conceptual foundations. Additionally, MGT 100 offers a good preview of the learning experience in quantitative masters programs, such as Masters of Science in Business Analytics.[1] MSBA is a relatively new type of degree that only goes back to about 2015, so many adults have limited knowledge about it and may confuse it with an MBA (Masters of Business Administration), but MSBAs are in high demand due to their ability to use data effectively to improve business decisions. MGT 100 also offers a partial preview of the learning experience in Masters of Data Science (MSDS) programs. MSBA and MSDS overlap in many areas, but MSBA content focuses more on domain knowledge, problem characteristics and solution implementation; whereas MSDS focuses more on methods and foundations than on the problems they are used to solve. For deeper training you may also consider a Ph.D. in related subjects, most especially Quantitative Marketing, Data Science, or Economics (especially applied micro, behavioral economics, or industrial organization).

Will you write me a recommendation letter? Gladly, if you perform well:

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[1]Note: the Rady MSBA program has an excellent required course called Customer Analytics & AI, but its content is substantially different and more advanced than MGT 100.

- A+ : Strong letter for any analytics-related masters or Ph.D. program in business, engineering or social science.

- A : Strong letter for analytics-related masters programs in business, engineering or social science.

- A- or below : Kindly request from someone in a better position to write a strong letter.

Any letter first requires a 1:1 meeting to explain your motivation, goals and strategy. Letter content will focus on the student's performance relative to the cohort, and explain why that is meaningful for the program in question. Professor is not qualified to write recommendations for graduate programs outside of business, engineering or social sciences (e.g., law, medicine, education, etc.). Please do not request before October 1 of the relevant application cycle.

Important UCSD Topics

We adopt the following policies based on university guidance.

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.

Non-Discrimination 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