

Customer Analytics Syllabus

UCSD MGT 100

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Faculty

Professor: Kenneth C. Wilbur,

Welcome

We welcome everyone to this course. We want all students to feel valued and safe. 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.

We have found that some students love this class, and we know that this is not an easy class for most students. We cover challenging material quickly. We understand that student learning styles differ and no single approach is best for everyone. We also know that anyone can go through a difficult time. Please tell us if you have trouble learning in this environment. We may be able to make suggestions, connect you with resources, or find appropriate accommodations. We will work with you as best we can. Please rest assured that most students pass this course.

Navigation

The latest versions of the course outline, calendar, slides, readings, data, class scripts and class recordings are online at <https://kennethwilbur.github.io/mgt100/>. Required pre-class readings are linked on the second slide of each class deck.

Canvas is (only) for turning in deliverables, study groups and grades.

The class Piazza page is linked in Canvas. We use Piazza for **all** other asynchronous communication, including course announcements, private messages and public discussions. If you have not used Piazza before, we think you will like it: Your question may be answered there before you realize you need to ask. We have been using Piazza for several years and have learned how to use it effectively. We offer the following guidance:

- Please comport yourself on Piazza as you would in the classroom: with patience, kindness and respect toward others. Please assume the best intentions about all questions and answers. Please use the best intentions when writing your own questions and answers. Please refrain from sarcasm and other message styles that may be easily misconstrued.
- Piazza posts about class material and 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.
- Piazza posts about university-sanctioned absences such as family emergency or illness should be private by default.
- Post messages to **Instructors**, not any individual instructional team member. We work as a team to process messages and we require all messages to be archived on Piazza.
- We promise that Piazza answers will be fastest. If you send us an email or canvas message, we will ask you to kindly post to Piazza before we reply.

We welcome you to office hours to get acquainted and for open-ended conversations. We meet students in the order they arrive, without appointments.

Course Introduction

Businesses cannot make money without customers. Customer Analytics are empirical frameworks that use customer data to improve decisions—especially decisions related to acquiring, serving, developing and retaining customers.

Unfortunately, customer data do not contain everything a business might like to know. For example, customer data typically exclude important fields like individual customer needs and willingness to pay, and also exclude important observations such as unserved potential customers. Therefore customer data are typically augmented with domain knowledge, theory, statistics and models to inform and improve business policies.

Our primary goal is to develop student understanding of how to use customer analytics to improve data-driven business decision-making. We also seek to develop student ability to interpret analytic techniques using code, and to expose students to a broad base of analytic techniques.

MGT 100 was designed by UCSD faculty for quantitative UCSD students. It can count toward the Business Economics major and the Business, Business Analytics and Marketing minors. In each class, we will discuss key concepts, take a short break, then walk through a script to implement selected techniques using code and data. We will not always finish the scripts in class, in which case you will need to study them on your own and finish the exercises as homework. We encourage you to work on those exercises in study groups, which we will assign during class in week 2.

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, as this is a particularly valuable but underutilized skillset in industry. The survey nature of the course is more typical of graduate business classes than most technical undergraduate classes, so the learning experience may feel unfamiliar. An advantage of a broad survey is exposure to 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 constraints.

Recent students indicated they studied an average of 7 hours per week outside of class, with substantial variance across students. Most students will need to commit approximately 5–10 hours per week outside of class to have a successful experience. 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.

An aside: Students often ask whether they should learn R or Python, or why we code in R. R and Python overlap in some areas, and each is currently better than the other for certain functions. We view R as a great supplement to Python. Python is a general-purpose toolkit 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. 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 R and Python. You should learn other languages also, as acquiring language proficiency is an important career skill in its own right, and a successful career in analytics will involve frequent skill acquisition and retooling.

MGT 100 can offer a good preview of the learning experience in Masters of Science in Business Analytics (MSBA) programs.¹ It could offer a partial preview of the learning experience in Masters of Data Science (MDS) programs, but it contains much more domain knowledge whereas MDS programs focus more intensively on methods rather than applications. MGT 100 could offer a partial preview of the learning experience in Masters of Business Administration (MBA) programs, but most traditional MBA courses are nontechnical, and are usually most valuable after a candidate has had a few years of work experience.

Deliverables and Grading

¹Note, the Rady MSBA program has an excellent required course which is also called Customer Analytics, but its content is mostly distinct from MGT 100.

There is no absolute grading scale. Mean grades will lie between 3.0 and 3.2, depending on group performance relative to prior years and instructor expectations. Earning an A is unusual ($\leq 8\%$) due to strong competition.

Final grades are calculated as a weighted average of Z-scores in 3 categories:

- class contributions (10%)
- 2 midterms (40% total)
- final exam (50%)

Class contributions: We seek to simulate a professional experience within the classroom. We expect consistent, timely attendance and active, well-prepared participation.

We assess contributions in three main ways. First, instructional assistants track students who conform to all classroom norms: sit near the front, use a name tent, arrive promptly, stay the entire time, engage actively with class content, and avoid distracting others. The IA should be able to read the student's name tent from across the room. There is no partial credit for attending class without conforming to all classroom norms. Second, we also ask IAs to track discussion participation. Positive contributions include helping to move the class discussion forward, kindly pointing out instructor mistakes, or asking questions when something is unclear. Negative contributions include multitasking, distracting others, off-topic side conversations, tardiness, leaving early, nonconformance to classroom norms or other distractions from class discussions. Third, we ask IAs to quantify student contributions on Piazza at the end of the quarter. In all contexts, contribution assessments can be positive or negative, based on our perceptions of how student contributions affect peers and the classroom experience as a whole. The professor collaborates with the IAs to ensure accuracy and consistency.

Midterms and Final Exam: We will use multiple-choice and short-answer questions to test your understanding and ability to apply key ideas. All exams will be on paper without access to digital resources, to disincentivize over-reliance on language models. You may bring any printed or written material you like. Readings, class material, scripts and homework questions will all be covered. We will not ask you to produce original code during the exams, but we will expect you to understand and interpret relevant code in the scripts, and we will ask questions that require reasonable understanding of the homework exercises. This will all be within reason, we will not intentionally write trick questions.

The midterms will be during class in weeks 4 and 8. The final exam will be in person at the university-appointed time and place. If a student misses any exam without a documented, university-sanctioned reason or exam alternative then we will set their exam score to the minimum exam score in the section. Please plan ahead to ensure you do not miss the exams.

Final Exam Alternative: Students may propose and complete an individual project as a final exam alternative. This is for anyone who wants to do extra work, or who plans to leave San Diego before the final exam, such as those starting summer internships in other cities. The project needs to use customer data in some original, useful way. The project should be proposed by the student, include a clearly delineated deliverable related to customer

analytics, and be explainably useful for the student's current interests or future career path. The proposal should be made in a private message on Piazza, is subject to instructor/IA revision, and needs to be finalized by the end of week 7 at the latest. The student will need to turn in the data, analysis code, and a concise write-up. The write-up should be 1-3 pages, with a main focus on the utility of the project results, and a respect for the reader's attention. Individual projects will be judged on a curve relative to other individual projects, based on value, accuracy and originality. Successful projects will reflect significantly more effort than the exam they replace. We do not make past projects available for students to review as that encourages duplication at the expense of originality.

Course Policies

Late Enrollment: Students who add the course after week 1 are individually responsible for catching up on all class content and deliverables.

Unplanned absences: We follow university policies regarding class and exam absences. Absences are acceptable in serious circumstances with documentation, such as a doctor's note for serious illness, with notification required prior to the exam. Briefly notify us with a private Piazza message, then focus on taking care of yourself or your family. Later, provide appropriate documentation so we can excuse the absence or reschedule the exam.

Generative Models We recommend and explicitly allow any use of generative models like ChatGPT or other services, except during exams. We view LLMs as helpful educational and coding aides, but poor substitutes for human understanding and not reliably accurate when given challenging or unique problems. Like people, LLMs are most effective when they are directed by a highly skilled person, so we incentivize you to develop your own skills.

Re-grade Requests: Any request for regrading must be made in writing on Piazza within two weeks of a deliverable being made available, or the end of the quarter, whichever comes first. 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.

Recommendations: Recommendation letters depend on class performance:

- A : Strong letter for any analytics-related Master's or Ph.D. program in business, engineering or social science
- A- : Letter for Master's programs may be possible depending on capacity.
- B+ or below : Kindly request from someone in a better position to write a strong letter.

Any letter first requires a 1:1 meeting to understand your goals and motivation. Letter content will focus on the student's performance relative to the cohort, and 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. Please do not request before October 1 of the relevant application cycle.

Important UCSD Topics

We adopt the following policies based on university guidance.

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 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.

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.

We will use automated means to detect plagiarism of submitted R scripts after week 10. Please do not share any R script outside of your own study group, as you cannot control what someone else may do with it.

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