Syllabus:

UCSD MGT 100, Customer Analytics

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Faculty

Professor: Kenneth C. Wilbur [Website CV](#).
Office hours: Wednesdays, 12:30-1:45 PM, at https://ucsd.zoom.us/j/9477848814

Welcome

We welcome everyone to this course. We want all students to feel valued and safe. We want you to succeed. We will work hard to help make that happen. You will need to participate actively, knowing that we have good intentions toward you, and investing time and effort to learn this valuable class material.

This is not an easy class for most people. We cover challenging material quickly. Yet please rest assured that most students pass this course.

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.

Navigation

The course outline, slides, readings, data, class scripts and class recordings are online at https://kennethcwilbur.github.io/mgt100/. Readings are linked on the second slide of the relevant class deck. All relevant class materials will be included on all assessments, including readings and scripts.

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. We offer the following guidance for effective Piazza use:

- Please comport yourself on Piazza as you would in the classroom: with patience, kindness and respect toward all.

- 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 personal issues such as family emergency or illness should be private by default. Post to **Instructors**, not any individual instructional team member. We work as a team to process messages.
- Piazza answers will be fastest. If you email us, we will ask you to kindly post to Piazza.

Office hours are for getting acquainted and for open-ended conversations. We meet students in the order they arrive.

Course Introduction and Policies

Customer Analytics are empirical frameworks that use customer data to improve decisions. Usually, customer data do not contain everything a business might like to know; for example, they often exclude important fields like willingness to pay, and important observations such as unserved potential customers. Therefore customer data are typically augmented with domain knowledge, relevant theoretical assumptions, statistics and other modeling frameworks 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 students 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 currently serves as a core course in the Business Economics major and as an alternate core course in 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 data. We will not always finish the scripts in class, in which case you will be expected to study and finish understanding them after class. Each script will conclude with an exercise which asks you to extend the script as a homework. We encourage you to work on those exercises in study groups, as we will assess your understanding of those exercises on the exams.

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, 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. The training focuses on the minimum viable knowledge needed to implement analytic techniques, so we have more time to cover more techniques. We offer numerous pointers to free resources that will enable interested students to deepen their understanding. However, the downside of a broad survey is that the class may feel "shallow" at times as each topic is incomplete by design, in order to preserve enough time to cover a wider range of topics.

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.

Past students indicated they studied an average of 7 hours per week outside of class, the most of any Business Economics core course, 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.

Deliverables and Grading

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 within 3 categories (weights in parentheses):

- 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, regular attendance and active 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, and participate actively during class. 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 track student contributions on Piazza.

Midterms and Final Exam: We will use multiple-choice and short-answer questions to test your understanding, apply key ideas, understand homework answers, and interpret familiar code. All exams will be on paper without access to digital resources. 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 relevant code and functions, including the homework questions at the end of each script.

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 listed on the UCSD Schedule of Classes.

Final Exam Alternative: We will offer an individual student 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 exam. 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, 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/TA 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 could be 1-3 pages, with a main focus on the usefulness of the project results, and a respect for the reader's time. 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.[1]

Course Policies

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

Study groups: We will randomly assign 4-person study groups during our week 2 class meeting.

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

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[1]If a student misses the final exam without completing an exam alternative then we will set their exam score to the minimum exam score in the section. Please plan ahead.

Generative Models We recommend and explicitly allow any use of generative models like ChatGPT or other services. We view LLMs as helpful coding tools and explanation generators, but poor substitutes for human understanding and not reliably accurate when given challenging or unique problems. We find that LLMs can complement and augment a high human skill level, or can substitute poorly for a low human skill level, so we seek to develop your human skill level.

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 position to write a stronger 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