Syllabus

MGTA 495: Marketing Analytics

Spring 2025

Instructional Team

The professor for this course is Dan Yavorsky. Dan holds an MBA and PhD from UCLA Anderson and has about 15 years of experience applying analytic and econometric 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 tries very hard to spend most of his time playing soccer with his kids, cycling with his brothers, sipping bourbon with his wife, and curating his collections of mechanical keyboards, grandfatherly pocket knives, boots, and statistics textbooks. In reality he spends most of his time consulting, teaching, raising kids, and oscillating between being a hoarder and a minimalist.

Dan Yavorsky

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- bio: website | LinkedIn | GBK bio

The TA for this course is Meenakshi Balakrishna. Meenakshi is finishing her PhD in marketing at UCSD Rady after completing her undergrad at Anna University in India and working as a business analyst for Target. Her research is broad, spanning firearm restrictions, consumer health, and sentiment analysis of product reviews.

Meenakshi Balakrishna

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Logistics

Overview

- Full Time MSBA Section meets Fridays 1-4pm in 1E107
- Flex MSBA Section meets on 5 Saturdays 8a-12p in 1E107 (4/5, 4/16, 5/3, 5/17, 5/31)
- TA Office Hours via Zoom at 8-9pm PT on Tuesdays (only weeks with assignment due)
- There are 5 problem sets, submitted as blog posts to your personal website that we will build together
- There is no midterm and no final exam

Materials

All materials for this course are on (or linked from) Canvas: FullTime | Flex.

Q&A

We will use Discussion Board within Canvas as the primary method of Q&A.

Course Introduction

Expert analysts are technically adept, statistically knowledgeable, and effective when communicating. This course is designed to enable students to develop in each of those three areas. In addition, the best analysts often have domain-specific expertise. Our focus in this course will be on analytically-based consumer insights to inform marketing strategy.

Students begin the course using Quarto, Git, and the Command Line to build a personal website, which will serve as a portfolio for their work in this course. We then structure the majority of the course around 5 marketing topics. For each topic, we spend half our time introducing and discussing the topic from a business perspective. The other half is devoted to understanding the statistical methodology and analytic techniques used in analysis related to the topic.

Each class session is followed by an application where students implement in R/Python/etc. the statistical technique discussed in class on a dataset, and interpret their results to inform a marketing strategy. Students report their approach, results, and recommendations in a post on their personal website.

I firmly believe in the idea that *you don't understand it until you code it.* In that regard, implementation of the analytic and statistical techniques will be done "by hand" and then compared to the results from routines readily available in software packages. This enables students understand the underlying assumptions and mechanics of the techniques, the limitations of the canned routines, and how students might approach an extension or modification to canned routines when their need arises.

The course simulates a professional experience within the classroom and therefore require no memorization, encourages collaboration, and ensures limited time but extensive resources to complete deliverables.

Topics

Our core marketing and statistical topics include:

1. **Why and when are experiments the best choice?**
   (Experimentation via Classical Frequentist Statistics)
   - A/B testing and Power Analysis
   - LLN, CLT, p-values, confidence intervals, and a case against hypothesis testing
2. **How to measure consumer preferences using a survey and Best-Worst Scaling?**
   (Consumer Preference Measurement via the Method of Maximum Likelihood)
   - Introduction to Maximum Likelihood Estimations
   - Normal, Logit, and Multinomial Logit models
3. **How to use conjoint analysis to set an optimal price?**
   (Pricing via Bayesian Statistics)
   - Introduction to Bayesian Statistics: Priors, Likelihoods, and Posteriors
   - Hierarchical Models
4. **What are the various "types" of customers in the market?**
   (Segmentation via Unsupervised Machine Learning)
   - Distance-based, tree-based, and model-based methods of clustering for continuous and categorical data
   - K-means, Hierarchical, Density-based, 2-step, Mixture Models, and goodness-of-fit metrics
5. **Which company practices are most important for customer satisfaction?**
   (Variable Importance via Supervised Machine Learning)
   - Bi-variate and Multi-variate models of association and Shapley Values
   - Cross Validation and Model Selection

Assignments and Grading

There are 5 assignments, each corresponding to one of the 5 topics. Each assignment is worth approximately 17% of the final grade, the exact amount may be adjusted to reflect the difficulty of the assignment.

The remaining 15% of the final grade is awarded for engagement and participation with the course, building your website on time, completion of the course evaluation, and the overall quality of the assigned deliverables.

There is no Midterm and no Final Exam.

Course Policies

Attendance

I strongly recommend regular attendance, as that can facilitate engagement and participation with the course, but I will not formally assess it. You should proactively anticipate and manage issues you might experience in balancing your efforts across courses or other obligations.

Collaboration

All assignments may be worked on in collaboration with other students. Collaboration is optional and groups should be small. Each student is individually responsible for creating and submitting their own work.

Contacting Instructors

Please use Canvas Discussions as the primary method to ask questions about course content and assignments, so that the instructor, TA, and other students can provide answers. For matters that pertain to you individually (illness, questions about grading, etc.) please email the instructor and cc the TA (or vice-versa); do not email us separately.

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 plagiarism 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. However, at the discretion of the professor and TA, an assignment may be accepted late for partial credit. It should be exceedingly rare that any student requests this and there is no guarantee that such a request will be granted.

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.

Schedule

Schedule: MGTA 495 Marketing Analytics
Spring 2025 | Full-Time MSBA Cohort

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
3/30	3/31	4/01	4/02	4/03	4/04	4/05
					Class 1-4p *Class Intro* *Quarto Websites*	
4/06	4/07	4/08	4/09	4/10	4/11	4/12
					Class 1-4p *Classical Stats* *Causality* *A/B Testing*	
4/13	4/14	4/15	4/16	4/17	4/18	4/19
Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico
4/20	4/21	4/22	4/23	4/24	4/25	4/26
		TA 8-9pm	**HW1 Due**		**Class 1-4p** *Maximum Likelihood*	
4/27	4/28	4/29	4/30	5/01	5/02	5/03
					Class 1-4p *MLE Examples* *MaxDiff*	
5/04	5/05	5/06	5/07	5/08	5/09	5/10
			Prof Dan in NOLA	Prof Dan in NOLA	Prof Dan in NOLA	Prof Dan in NOLA
		TA 8-9pm	**HW2 Due**		**Class 1-4p** (via Zoom) *Conjoint*	
5/11	5/12	5/13	5/14	5/15	5/16	5/17
					Class 1-4p *Bayesian Stats* *Hierarchical Models*	
5/18	5/19	5/20	5/21	5/22	5/23	5/24
		TA 8-9pm	**HW3 Due**		**Class 1-4p** *Segmentation*	
5/25	5/26	5/27	5/28	5/29	5/30	5/31
					Class 1-4p *Unsupervised ML* *Cluster Analysis*	
6/01	6/02	6/03	6/04	6/05	6/06	6/07
		TA 8-9pm	**HW4 Due**		**Class 1-4p** *Supervised ML* *Variable Importance* *Key Drivers Analysis*	
6/08	6/09	6/10	6/11	6/12	6/13	6/14
		TA 8-9pm	**HW5 Due**			

Schedule: MGTA 495 Marketing Analytics
Spring 2025 | Flex MSBA Cohort

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
3/30	3/31	4/01	4/02	4/03	4/04	4/05
						Class 8a-12p *Class Intro* *Quarto Websites*
4/06	4/07	4/08	4/09	4/10	4/11	4/12
					Class 1-4p (Zoom + Recorded) *Classical Stats* *Causality*	
4/13	4/14	4/15	4/16	4/17	4/18	4/19
Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico	Prof Dan in Mexico
4/20	4/21	4/22	4/23	4/24	4/25	4/26
		TA 8-9pm	**HW1 Due**			**Class 8a-12p** *Maximum Likelihood* *MLE Examples* *MaxDiff*
4/27	4/28	4/29	4/30	5/01	5/02	5/03
						Class 8a-12p *Bayesian Stats* *Hierarchical Models* *Conjoint*
5/04	5/05	5/06	5/07	5/08	5/09	5/10
			Prof Dan in NOLA	Prof Dan in NOLA	Prof Dan in NOLA	Prof Dan in NOLA
		TA 8-9pm	**HW2 Due**			
5/11	5/12	5/13	5/14	5/15	5/16	5/17
						Class 8a-12p *Unsupervised ML* *Cluster Analysis* *Segmentation*
5/18	5/19	5/20	5/21	5/22	5/23	5/24
		TA 8-9pm	**HW3 Due**			
5/25	5/26	5/27	5/28	5/29	5/30	5/31
						Class 8a-12p *Supervised ML* *Variable Importance* *Key Drivers Analysis*
6/01	6/02	6/03	6/04	6/05	6/06	6/07
		TA 8-9pm	**HW4 Due**			
6/08	6/09	6/10	6/11	6/12	6/13	6/14
		TA 8-9pm	**HW5 Due**			

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