

## **MRKTB8633: Data Science for Marketing Managers**

### **Summer 2023, .5 Credits**

**July 24-28 8:30 – 11:45 AM, Kravis**

#### **Shawndra Hill**

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Office Hours: 11:45 am – 12:45 pm July 24-25 or by appointment

COURSE/TEACHING ASSISTANTS

TBD

Communications from professor and teaching assistants about the course will take place through Canvas. Students should make sure they regularly check for announcements and messaging notifications.

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### **1. Course Overview**

This course is for students who want to learn how to manage data scientists/data science projects in Marketing. This course connects real-world data on consumers and firms to decision-making and marketing management. The course will cover many real-world data driven marketing examples to illustrate applications of methods used in data science. The use of real-world examples and cases places these techniques in context and teaches students how to avoid the common pitfalls of data science management, emphasizing the proper application of data science techniques and pipelines. In addition, the course focusses on the unique requirements for managing data science teams and projects. This course covers the considerations that go into starting and completing successful data science projects in both small and large firms, focusing on the data science process of deploying models.

The goal of this course is three-fold. After taking this course you should:

***Approach marketing and advertising problems data-analytically.*** Think carefully & systematically about whether & how data can improve business performance.

***Be able to interact competently on the topic of data science.*** Know the basics of data science processes, algorithms, & systems well enough to interact with CTOs, expert data scientists, and business analysts. Be able to envision data-science opportunities.

***Be able to manage data science projects in marketing:*** Learn how to build a strong team by understanding the different roles needed to support both large and small scale projects. Learn how to mitigate risks in data science product delivery and deliver impact.

### **2. Instruction Method**

#### **Lectures**

This is primarily a lecture-based course, but student participation is an essential part of the learning process. The course will explain with real-world examples the inner workings and uses of various data science techniques used in Marketing and Advertising. The primary emphasis is on understanding the various types of data science techniques, how to evaluate their results, and when and how to use them, and secondarily on the mechanics of how they work. Once a basic understanding of data science is established, we will focus on managing data science projects including building a team, what goes in to making go/no go decisions on projects, and investments in onsite/offsite infrastructure and data.

### **Quiz and Class Participation (15%)**

Each class session, including the first, has materials you must read prior to class. We will have a very short quiz at the beginning (first 5-10 minutes) of each class based on the readings. The quiz grades will factor into your class participation and attendance grade. In addition, there will be opportunities to comment on content (questions, articles, etc.) on Canvas.

### **Learning by Assignments (25%)**

There will be a total of 4 question assignments, each comprising a (multi-part) question. In addition, the assignments may involve hands-on work. You must turn in *all* question answers on the dates they are due. They will be graded and returned promptly. One of the assignments will be longer to cover the crash course in data science material.

### **Data Science Project (50%)**

As your final project, you will be required to complete a novel data science project proposal (~3 pages with presentation slides and links to supporting documents) to address a pressing issue or problem in the Marketing and Advertising industry right now for a company of your choosing. You will first pick a firm that is known to collect a significant amount of user or business data for Marketing and/or Advertising and then solve a Marketing Problem for that firm. Some examples of Marketing Problems firms are facing today are: Cross Channel Advertising Effectiveness Measurement, Signal Resilience for Target Marketing due to new Regulations (CCPA, GDPR), Utilizing Social Network Data for Ad Targeting. You will be given detailed guidelines for the structure of your final project on week 2. Your instructor will help you with some project area ideas to solve if needed, though you are encouraged to choose your own, which will need approval. You will work in groups of size 3-5 students (Depending on Class Size). We will need to keep the number of projects for the class to 10.

### **Data Science Peer Project Review (10%)**

You will be given 2 of your class projects to review from a feasibility, (legal), and privacy perspective as a take home assignment. Your ability to critique data mining project proposals (as a manager) is one of the most important skills to take away from the course.

## **3. Requirements and Grading**

This is a lecture-style course, however student participation is extremely important. Students are required to be prepared and read the material or watch assigned videos **before** class. **Students are required to attend all sessions and discuss with the instructor any absence from class. 2 or more absences will result in a 0 for class participation (15% of your grade).** Attendance is important because every class builds on the last. In addition, if you missed the first class or two, you are still responsible for getting assignments in.

As discussed above, you will hand-in 4 (individual) write-ups to questions that will be assigned in class and will be posted on the class Canvas site. Answers should be well thought out but concise. The assignments will be based on the current day's readings and lecture and in some cases provide exercises to help you prepare for your final project. Points will be deducted for sloppy language and irrelevant discussion. You will submit all assignments on canvas.

**Note that you must put your name on your assignments to receive credit.**

You will be assigned a longer assignment to cover the crash course in data science material. This assignment will be worth 33% of your assignment grade.

### **Late assignments**

Turn in your assignments early if there is any uncertainty about your ability to turn it in on the due dates. **Assignments up to 1 day late will have their grade reduced by 50%.** After one day, late assignments will receive no credit (**no exceptions**).

There will be one team project (teams of 3-5 students) in which students will address business problems with data mining techniques. Students will hand in a pre-proposal (15% of project grade), a final writeup (accounts for 40% of project grade) and prepare a short class presentation of their work (40% of project grade). Students will also prepare a contribution report that details the contribution of team members including themselves (5%). A class discussion will follow the presentations. Details of the requirements for the project will be discussed the second week of class.

There will not be a required final exam at the end of the semester. The main deliverable in the class is the Data Science Project, including presentation.

The grade breakdown is as follows: 1. Pre-class Assignment Questions (4) including crash course in data science: 25 points 3. Data Science Project: 50 points 4. Class Participation (And Quizzes) 15 points. Peer Project Reviews 10 points.

Group Assignments: You may form your own group on Day 1. We will provide instructions for how to submit your group members on Canvas. Professors will assign groups for students not already in a group by Day 1.

**Cell phone usage is not permitted in class. It is preferred that you use your iPad to take notes and follow along. The lessons will be taught in person. However, if you are remote, you must turn your video on during class. Please keep yourself on mute if you are not speaking.**

### **4. Teaching Materials**

The following are reading materials are required for this course:

1. [Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking](#) Tom Fawcett and Foster Provost ([free same day in NY](#) if you haven't purchased already)
2. Supplemental readings will be provided as the class progresses.

\*The required readings will be posted a month in advance to the course start date and are subject to change until then.

\*\*The instructor will also post short videos from time to time covering real world examples of Data Science managers

Note there is no comprehensive book on the subject of this course. Therefore, the course readings will rely on a mix of Data Science textbook and publicly available research and practitioner content on the web.

### Optional Reading

1. Managing Your Data Science Projects: Learn Salesmanship, Presentation, and Maintenance of Completed Models Robert de Graaf
2. Ethics and Data Science: <https://www.oreilly.com/library/view/ethics-and-data/9781492043898/>

### 3. Course Schedule

Session	Topic(s)	Required Readings	Due Tuesday
1(A) Jul 24	<b>Fundamentals of Data Science for Marketing Part I:</b> Data, Models, Applications, Big and Small Challenges	<p><b>Optional:</b>  <a href="https://towardsdatascience.com/20-practical-ways-to-implement-data-science-in-marketing-e10da4a6d0b2">https://towardsdatascience.com/20-practical-ways-to-implement-data-science-in-marketing-e10da4a6d0b2</a></p> <p><a href="https://lp.liveramp.com/2018-03-eb-ideabook-people-based-mktg_Registration-Page.html">https://lp.liveramp.com/2018-03-eb-ideabook-people-based-mktg_Registration-Page.html</a></p> <p><b>Data Science for Business</b> Chapters 2, 3</p> <p><a href="#">(6) What Is MarTech and AdTech - And What's The Difference?   LinkedIn</a></p> <p><a href="#">10 Examples of Data Science in Marketing (netguru.com)</a></p>	Assignment 0 (Personal Info Survey) +Team Members Submitted or randomly assigned
1 (B) Jul 24	(cont,) supervised/unsupervised learning and appropriate evaluation methods are used in Marketing  Applications will include: Audience Analysis, Target Marketing, Lead Scoring, Identity Resolution,	<p><a href="https://towardsdatascience.com/20-practical-ways-to-implement-data-science-in-marketing-e10da4a6d0b2">https://towardsdatascience.com/20-practical-ways-to-implement-data-science-in-marketing-e10da4a6d0b2</a></p> <p><a href="https://lp.liveramp.com/2018-03-eb-ideabook-people-based-mktg_Registration-Page.html">https://lp.liveramp.com/2018-03-eb-ideabook-people-based-mktg_Registration-Page.html</a></p>	Assignment 1

	Customer Personas/Segmentation, Text/Sentiment Analysis, Ad Ranking, Advertising Optimization	<b>Data Science for Business</b> Chapters 2, 3, 6,	
2 Jul 25 (A)	<b>Fundamentals of Data Science for Marketing Part II:</b> We will cover field experiments and causal inference techniques used in Marketing and Advertising  Applications will include: Brand Lift Measurement	-- <a href="#">Microsoft Word – Draft Field Experiments in Marketing March 2015.docx (povertyactionlab.org)</a> -- <a href="#">Run Field Experiments to Make Sense of Your Big Data (hbr.org)</a>  <b>Data Science for Business</b> Chapters 8	
2 Jul 25 (B)	<b>Fundamentals of Data Science for Marketing Part II:</b> We will continue to cover field experiments and causal inference techniques used in Marketing and Advertising  Applications will include: Brand Lift Measurement and others	-- <a href="#">Microsoft Word – Draft Field Experiments in Marketing March 2015.docx (povertyactionlab.org)</a> -- <a href="#">Run Field Experiments to Make Sense of Your Big Data (hbr.org)</a>  <b>Data Science for Business</b> TBD	Assignment 2
3 (A) Jul 26	<b>Connecting Data Science for Marketing with Project and Performance Management:</b> Data Science Process, Timelines and Milestones, Aligning on strategy, effective Presentation of Ideas	-- <a href="#">What Is OKR? The Goal-Setting System To Scale Up Your Business – FourWeekMBA</a> -- <a href="#">Ally.io   OKR Examples</a> -- <a href="#">What Matters: Free OKR software &amp; tools: Best ways to track goal setting</a> -- -- <a href="#">How to Use OKRs for your AI Team</a>	
3 (B) Jul 26	<b>Survey Design and Management Guest Speaker</b> (David Rothschild, Principal Researcher, Microsoft Research and Founder PredictWise) — Survey Design and Applications	-- <a href="#">Xbox Experiment/Survey in 2012</a> -- <a href="#">Post-election 2020 wrap-up from PredictWise</a>	Assignment 3 +Pre-proposal Due
4 (A) Jul 27	<b>Connecting Data Science for Marketing with Product and Company Impact:</b> Product Impact. Social Impact, Decision Making Impact, Understand Work	<b>Data Science for Business</b> Chapters 13, 14, Appendix A	
4 (B) Jul 27	<b>Privacy, Policy, Ethics</b>	-- <a href="#">[1803.09010] Datasheets for Datasets (arxiv.org)</a> -- <a href="#">What is a Walled Garden? And why it is the strategy of Google, Facebook and Amazon Ads platform?   by Pierre de Poulpiquet</a>	Assignment 4

		<a href="#">  mediarithmics_what is?   Medium</a> -- <a href="#">The Ethics of Big Data   Socialnomics</a> -- <a href="https://hannawallach.medium.com/big-data-machine-learning-and-the-social-sciences-927a8e20460d">https://hannawallach.medium.com/big-data-machine-learning-and-the-social-sciences-927a8e20460d</a>	
5 Jul 28 (A)	<b>Building a Data Science Team:</b> Roles, Domain Experts, Complementary Skills, Interviewing, Onboarding, Paying Third Parties, Common Motivations of Data Science Team Members, Supporting the Larger Organization <b>Communicating Results and Forming Partnerships from the Start</b>	<a href="#">Building Data Science Teams (datascienceassn.org)</a>  <a href="#">Building up a Data Science Team from Scratch   by Amadeus Magrabi   commercetools tech</a>	
Date TBD (F) Tentatively in class Jul 28	Final Project and Presentation		-- Final Project (slides due night before at 11:59pm)
Date TBD (T)	Project Peer Reviews Due		(due at 5pm) Note time is not midnight

NOTE:

- This version of the syllabus is as of March 29, 2023. Details may change with time.