**Data Science for Marketing Managers**

Term: 2021 Spring B

Day and Time: TBD

Classroom: TBD

Professor : Shawndra Hill

Office hours: TBD

TA: TBD

**Correspondence:**

Please use canvas to communicate first.

Email sbh2146@gsb.columbia.edu subject: Data Science for Marketing Managers

**1. Course Overview**

This course is for students who want to learn how to manage data scientists and 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 data successful data science projects in both small and large firms.

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 detailed 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.

**Learning by Assignments**

Each class session has materials you must read prior to class. There will be a total of 6 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. You will also be asked to complete one longer homework assignment that covers the crash course in data science material.

**Data Science Project Proposal**

As you final project, you will be required to complete a novel data science project proposal (~15 pages with presentation slides) to address a pressing issue in the Marketing and Advertising industry right now. You will first pick a firm that is known to collect a significant amount of user or business data 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. Your report should include Introduction, Related Work, Methodology, Onsite/Offsite Data, Onsite/Offsite Computing Needs, Expected Results, Comparison/Analysis, Privacy and Legal Considerations, Team Construction, Estimated cost, Timeline and Milestones, Expected Impact, Conclusion and Future Work, and References. Your instructor will help you with some project area ideas to solve, though you are encouraged to choose your own, which will need approval. You will work in groups of size 2-3 students.

**Data Science Project Review**

You will be given 2 of your classmate’s projects to review from a feasibility, legal and privacy perspective as a take home assignment. Your ability to critique data mining project proposals 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 **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 6 (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 and concise. The assignments will be based on the current week’s readings. 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 15% of your 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 2-3 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 proposal (accounts for 50% of project grade) and prepare a short class presentation of their work (20% of project grade). Students will also prepare a contribution report that details the contribution of team members including themselves (15%). 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 Proposal and presentation.

The grade breakdown is as follows: 1. Pre-class Assignment Questions (6): 10 points 2. Crash Course in Data Science Assignment: 15 points 3. Data Science Project Proposal: 50 points 4. Class Participation 15 points 5. Peer Project Reviews 10 points.

**Cell phone usage is not permitted in class. The lessons will be taught remotely. You must turn your video on during class.**

**4. Teaching Materials**

The following are reading materials for this course:

1. [Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking](https://www.amazon.com/Data-Science-Business-Data-Analytic-Thinking/dp/1449361323) Tom Fawcett and Foster Provost
2. Managing Your Data Science Projects: Learn Salesmanship, Presentation, and Maintenance of Completed Models Robert de Graaf
3. Supplemental readings will be provided as the class progresses.

**4. Course Schedule (Tentative Order)**

|  |  |
| --- | --- |
| Week | Topics |
| 1 Fundamentals of Data Science for Marketing Part I | We will cover how supervised/unsupervised learning and appropriate evaluation methods are used in MarketingApplications will include: Audience Analysis, Target Marketing, Lead Scoring, Identity Resolution, Customer Personas/Segmentation, Text/Sentiment Analysis, Ad Ranking, Advertising Optimization |
| 2 Fundamentals of Data Science for Marketing Part II | We will cover field experiments and causal inference techniques used in MarketingApplications will include: Brand Lift Measurement, Cross Channel Advertising, User Experience |
| 3 Connecting Data Science for Marketing with Project Management  | Data Science Process, Timelines and Milestones, Getting Buy-in from Execs, Effective Presentation of Ideas |
| 4 Connecting Data Science for Marketing with Product Impact | Guest Speaker: Sheldon Gilbert (Proclivity Systems)Quantifying Product Value |
| 5 Building Data Science Teams | Roles, Domain Experts, Complementary Skills, Interviewing, Onboarding, Common Motivations of Data Science Team Members, Supporting the Larger Organization |
| 6 Infrastructure and Data | Onsite/Offsite, Cloud Computing (AWS, Azure,etc), Third party panel data sets |

NOTE:

* This version of the syllabus is as of October 2020. Certain details may change with time.