MKTG 2120: Data and Analysis for Marketing Decisions

Time/Room TBD

Instructor: Professor Ryan Dew (ryandew@wharton.upenn.edu)
Professor Office Hours: TBD
Teaching Assistants: TBD
TA Office Hours: TBD

Course Description

This course introduces students to the fundamentals of data-driven marketing, including topics from marketing research and analytics. It examines the many different sources of data available to marketers, including data from customer transactions, surveys, pricing, advertising, and A/B testing, and how to use those data to guide decision-making. Through real-world applications from various industries, including hands-on analyses using modern data analysis tools, students will learn how to formulate marketing problems as testable hypotheses, systematically gather data, and apply statistical tools to yield actionable marketing insights.

Course Goals

By the end of this course, you should be able to:

- Ask quantifiable questions about marketing decisions
- Know what data exist or can be gathered to answer marketing questions, and understand which kinds of questions these sources can answer
- Understand and apply statistical tools for answering many marketing questions
- Create experiments and statistical models for marketing analytics
- Intelligently discuss recent advances in marketing research and analytics, including machine learning, recommendations, and personalization

Course Policies and Requirements

- **Prerequisites:** Introductory statistics (e.g., STAT 101/102), and MKTG 101.

- **Textbook:** There is no required textbook. There are two optional textbooks:
  1. *R for Marketing Research and Analytics* by Chapman and Feit (CF on syllabus) (Available digitally through the library.)
  2. *Marketing Research* by Aaker, Kumar, Leone, and Day (AKLD on syllabus)

- **Canvas:** This course will rely heavily on Canvas. All announcements will be made through Canvas, all readings, lecture slides, and recordings will be posted on Canvas.

- **Lecture slides and recordings:** I will post the slides before lectures whenever possible, and all lectures will be recorded. However, I encourage you to take your own notes, or simply engage with the live lecture, rather than following along on the slides: a "heads-up" learning experience can be tremendously valuable.

- **Grade Posting:** Grades will always be posted on Canvas when ready. Do not email or message us asking for your grade.

- **Required Software:** Excel (with Analysis ToolPak and Solver), R
  (see Software section of the syllabus for more details)

- **Assignments:** All assignments should be submitted on Gradescope, which can be accessed through Canvas. ***No late submissions will be accepted***. There are no make-up assignments.

- **Asking Questions:** All questions about the assignments, exams, and lecture content should be posted on Ed Discussion. Please do not email the professor or the TAs. If you have a question, chances are others do too, and we can help everyone by addressing questions online. For the fastest reply to any other questions, please use Ed Discussion to send a "Private" message to the whole teaching staff, which will send your message to the professor and all the TAs.

- **Poll Everywhere:** We will use Poll Everywhere for class participation, and to track attendance. *You must create a Poll Everywhere account, and use that account when you participate, for your participation to be recorded.* I will send instructions on how to create a participant account early in the semester.

Software

In this class, we will make extensive use of two of the most popular data analysis tools in practice: Microsoft Excel and the R statistical programming language. Becoming familiar with these tools is fundamental to marketing research and analytics. If time permits, we may also explore other tools.

I will assume you have some basic familiarity with Excel. I will not assume you know anything about R. For all tools, the examples we use in class will be posted to Canvas, as well as step-by-step tutorials showing you how to carry out the analyses. Assignments will primarily entail replicating these analyses in new settings. This is not a coding class!

I will demonstrate all analyses in class using R or Excel. You may use whatever software you like to do homework (e.g., R, Excel, Python, JMP, Stata), but I can't offer help for programming languages besides Excel and R. Instructions on downloading and setting up R will be available on Canvas. Please email me if you do not have access to Excel.

Deliverables and Grades

The final course grade will be determined by:

- 50% - Exams
    - 20% = Midterm (your better score of two)
    - 30% = Final exam
- 30% - Assignments
- 10% - Canvas quizzes (graded for completion; miss up to 2 with no penalty)
- 10% - Course participation (see details below)

Exams

There will be three exams—two midterms and one final—that test your comprehension of course concepts. These are individual, open book exams. The final will occur during the regularly scheduled final exam period and is cumulative. Of the two midterms, only the higher score will count toward your final grade. Note that this policy only applies to the midterms; the final exam will count for everybody. **No coding (Excel or R) will be required during the exams**.

Only SDS-approved exam accommodations will be accepted, **no exceptions**. If you have SDS-approved exam accommodations, it is your responsibility to make me aware of these.

Assignments

There will be several assignments which will focus on applying the ideas and methods learned in class. Often, these assignments will involve working with real company data. As mentioned above, you may use whatever tool you like to do these assignments (including Excel and R). However, if you use something other than Excel or R, we can't provide support.

You have the option of working in a group for all of the assignments. Groups may be up to five students, from any of my course sections. You may also work individually. There is no need to stay with the same group for all of the assignments. **You must enter your group members when submitting on Gradescope.**

Quizzes

These will be given most weeks on Canvas. The questions are based on the content of that week's lectures. **They are always due on Sunday at 11:59PM on Canvas**. They are graded for completion, and you can miss up to two quizzes without penalty. These quizzes are designed to help you prepare for the exams and will contain questions *very similar* to the exam questions. They will also help me assess whether everyone is comfortable with that week's lecture content.

Course Participation

To earn full points for participation, students must do two things:

1. Stay up-to-date with the class, by coming to class and participating in the Poll Everywhere polls. If you cannot come to class in-person, you should watch the recording and submit the poll before the next lecture. You may miss up to 2 polls with no penalty, for any reason (excused or otherwise). After that, missing polls will hurt your grade.

2. Engage with the class on Ed Discussion. By engage, I mean both asking *and thoughtfully answering* other students' questions. You do not necessarily need to be 100% correct in your responses, but should make an effort to help.

The two parts are *compensatory*: you may "make up" for missing polls by posting high quality content on Ed, and vice versa. **However, to receive *any* participation points, you must do at least the bare minimum: submit at least 50% of the polls), and post publicly on Ed Discussion at least once.**

Grade Cut-offs

There is no curve. I am happy to award an A to anyone who has earned it. The tentative cut-offs for determining your final letter grade are:

A	93.00%
A-	90.00%
B+	87.00%
B	83.00%
B-	80.00%
C+	77.00%
C	73.00%
C-	70.00%
D	60.00%

These are the *lowest possible scores* to achieve each letter grade. A+ will be awarded at my discretion only. In the past, A+ was given for achieving a high total score (>97%), together with actively attending and participating in class. For students with final course grades very close to the cut-offs (within 0.5%, i.e., "rounding distance"), I will only consider "bumping up" your letter grade if you have actively and thoughtfully participated during in-class discussions, and on Ed Discussion. There are no extra credit assignments, and this is solely at my discretion.

Tentative Course Schedule

bold = deliverable/required

AKLD = Aaker, Kumar, Leone, and Day textbook; CF = Chapman and Feit textbook

		Readings
Module 1: Foundations of Marketing Data		
1.	Course Introduction	*AKLD Ch. 3-4*
2.	Qualitative Methods	*AKLD Ch. 8-10,*
3.	Survey Design	**Modal American**, *AKLD Ch. 11-12, 14-15*
4.	Secondary Data	*AKLD Ch. 5-7*
5.	Experimentation and A/B Testing	*AKLD Ch. 13*
Module 2: Foundations of Marketing Analysis		
6.	Tools of Data Analysis	
7.	Hypothesis Testing	*AKLD Ch. 17-18, CF Ch. 6*
8.	Applications: Hypothesis Testing	
9.	Regression Analysis	*AKLD Ch. 19, CF Ch. 7*
10.	Marketing Mix Models	
11.	Pricing Analysis	
12.	CRM and Logistic Regression	*CF Ch. 9, 13*
13.	Text Analysis	**Happiness Calculator**
Module 3: Marketing Research Methods		
14.	Introduction to Conjoint	*AKLD Ch. 21, CF pp. 246-252*
15.	Ratings-based Conjoint	
16.	Choice-based Conjoint	*CF Ch. 13*
17.	Cluster Analysis	*AKLD Ch. 20, CF Ch. 11*
18.	Factor Analysis	*AKLD Ch. 20, CF Ch. 8*
19.	Applications: Factor and Cluster Analysis	
20.	Models of New Product Diffusion	
Module 3: Marketing Analytics		
21.	Customer Lifetime Value (CLV)	**Planet Money: CLV**
22.	Digital Marketing and Attribution	
23.	Predictive Analytics 1: Machine Learning	
24.	Predictive Analytics 2: Building Models	
25.	Guest Lecture: Analytics	
26.	Personalization, Recommendations, and Ethics	**TBD**