MKTG212: Data and Analysis for Marketing Decisions

Instructor: Professor Zhenling Jiang (zhenling@wharton.upenn.edu)

(Virtual) office hours: Monday 4-5pm

                             Wednesday 9-10am

Teaching Assistants:

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(Virtual) office hours: Friday 3-4pm

NOTE: This is a tentative plan for the course. Updates and adjustments may be necessary.

Online Course Format and Logistics

- Lectures:

  There are two options for attending the lectures, join the live (synchronous) lectures via Zoom, or watch recordings afterwards (asynchronous). While I encourage you to join the live lectures, you will not be penalized in any way if choosing the second option (e.g. no attendance taken for live lectures). Links to the lectures and office hours will be on Canvas. Based on the survey feedback, many of you can only make it to one of the sections. To accommodate more people, I will be doing the live lecture twice, at both 9am and 10:30am (same content). You should try to attend the one where you are registered. But if you can only make it to the other one, you can choose to do so, and there is no need to formally switch section in registration.

- Course material:

  Recordings of the lectures will be made available following the live lectures. Note that it usually takes some time to process, hence expect some delay. Slides and other materials will be shared on Canvas.

- Office hours:

  To support effective learning in an online environment, where asking a question may be more difficult compared to in a classroom, I will hold additional (virtual) office hours. You should feel free to come to these sessions to ask questions about the course content. The office hours (along with TA office hours) are scheduled in a way that cover different times of the day, so that hopefully one of them will suit you.

- TA office hours:

  The TAs will also hold office hours where you can ask questions about the assignments, or get help with course content.

- Canvas discussion board:

  In addition to office hours, you can also utilize the Canvas discussion board to ask questions. Using the discussion board instead of email would facilitate learning from others' questions. I encourage you to try to answer each other's question (think of it as a virtual study group). Both me and our teaching assistants will also monitor the board and answer questions.

Course Description

Data is increasingly driving marketing decisions. Firms have access to more data, and more detailed data on their customers and marketing than ever before. Such data may include in-store and online customer transactions, product usage data, data from experiments, customer surveys, and data on prices and advertising. This course is an introduction to the fundamentals of data-driven marketing, including topics from marketing research and analytics. Using real-world applications from various industries, the goal of the course is to familiarize students with several types of marketing problems as well as how to leverage data to make effective marketing decisions. The course will involve formulating critical problems, developing relevant hypotheses, analyzing data and, most importantly, drawing inferences and telling convincing narratives, with a goal of producing actionable results.

Course Goals

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

- Ask quantifiable questions about managerial decisions
- Know what data sources exist or can be gathered to answer marketing questions, and understand which kinds of questions these sources can answer
- Gather your own data in an effective, principled manner to answer marketing questions
- Understand and apply statistical tools to answer many common marketing questions
- Intelligently discuss recent advances in marketing research and analytics, including machine learning and AI

Course Policies

- Prerequisites: Introductory statistics (e.g. STAT101). MKTG101 is recommended.

- Textbook: There is no required textbook. There are two optional textbooks:
    - *R for Marketing Research and Analytics* by Chapman and Feit (CF on syllabus) (Available digitally: https://franklin.library.upenn.edu/catalog/FRANKLIN_9977137149303681)
    - *Marketing Research* by Aaker, Kumar, Leone, and Day (AKLD on syllabus) (On reserve at Lippincott Library.)

- Canvas: This course will rely heavily on Canvas. All announcements will be made through Canvas, all lecture slides, and recordings will be posted on Canvas, and all homework submissions and exams will be done through Canvas.

- Grades will always be posted to Canvas when ready. Please do not email asking for your grade.

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

- Readings: Required readings and/or videos will be posted on Canvas.

- Assignments: All assignments are to be submitted to Canvas. ***No late submissions will be accepted***, and there are no make-up assignments.

- Questions: Questions about assignments should be posted on the Canvas discussion board. Please do not email the professor or TA questions about assignments. If you have a question, chances are others do, too, and we can help everyone by addressing questions online.

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.

I will demonstrate all analyses in class using either Excel or R, with an emphasis on Excel. You may use whatever software you like to do homework, 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.

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

Assessment

The final course grade will be determined by:

- 40% - Exams
    o 10% = Midterm 1
    o 10% = Midterm 2
    o 20% = Final exam
- 30% - Assignments
- 15% - Weekly quiz
- 15% - Group project

Exams:

There will be two midterms and one final. These are individual exams. The two midterms will be done during class. Midterm 2 is not cumulative. The final will occur during the regularly scheduled final exam period and is cumulative. All three exams will be administered through Canvas.

Groups:

The assignments and final project are group-based. Each group can have up to five students. You may also choose to work individually.

    o **Sign-up to a group on Canvas by 09/25**

Assignments:

The assignments are aimed at applying the ideas and methods learned in class. Parts of these assignments will involve doing actual analysis of real data, but the goal of them is not to test

programming skills. As mentioned above, you may use whatever tool you like to do these assignments (including Excel and R).

Project:

Similar to assignments, you can work in a group up to 5 students for the project. In the project, you will explore something interesting to you. You may:

1. Apply the methods learned in class to an interesting dataset or marketing problem,
2. Report on a method that may be useful to marketing managers, but was not covered,
3. Report on a recent development in data-driven marketing, or on a company doing interesting work in the space.

The deliverable of the project will be an in-class presentation or recorded video (~5 minutes long). These will be graded on how relevant they are to the course, and on the quality of the presentation.

Online 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 Sundays at 11:59PM ET** on Canvas. The lowest 3 will be dropped, so that you can miss up to 3 quizzes without penalty. These quizzes are designed to help you stay on track with the course material. They will also prepare for the exams and will contain *similar* questions to the exam.

In-lectures polls and discussions:

While we will use some interactive tools during class (e.g. polls and break-out rooms), these components will not count towards your grade. If you choose to watch the recordings asynchronously and cannot participate, there is no penalty.

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+	75.00%
C	70.00%
D	60.00%

These are the *lowest possible scores* to achieve each letter grade. A+ will be awarded at my discretion, typically to students who achieve a near perfect score across all deliverables, and actively participate throughout the course.

<u>Tentative Course Schedule</u>
bold = deliverable/required; *italics* = optional
AKLD = Aaker, Kumar, Leone, and Day textbook; CF = Chapman and Feit textbook

1	9/1	Course Introduction	*AKLD Ch. 3-4*
2	9/3	Primary Data	*AKLD Ch. 8-10*
3	9/8	Surveys	*AKLD Ch. 11-12, 14-15*
4	9/10	Experimentation I	*AKLD Ch. 13*
5	9/15	Experimentation II	
6	9/17	Secondary Data	*AKLD Ch. 5-7*
7	9/22	Tools of Data Analysis	
8	9/24	Statistical Testing	*AKLD Ch. 17-18, CF Ch. 6*
	9/25	**Sign up to a group**	
9	9/29	Application: Statistical Testing	
10	10/1	Linear Regression I	*AKLD Ch. 19, CF Ch. 7*
	10/5	**Assignment 1 Due**	
11	10/6	Linear Regression II	
12	**10/8**	**Midterm Exam I**	
13	10/13	Logistic Regression	*CF Ch. 9, 13*
14	10/15	Guest speaker: Naser Hamdi *Equifax, Senior VP Data & Analytics and Marketing*	
15	10/20	Cluster Analysis	*AKLD Ch. 20, CF Ch. 11*
16	10/22	Factor Analysis	*AKLD Ch. 20, CF Ch. 8*
17	10/27	Application: Cluster and Factor Analysis	
18	10/29	Conjoint Analysis I	*AKLD Ch. 21, CF pp. 246-252*
	11/2	**Assignment 2 Due**	
19	11/3	Conjoint Analysis II	
20	11/5	Choice-based Conjoint	*CF Ch. 13*
21	11/10	New Product Forecasting	
22	11/12	Customer Lifetime Value	*Planet Money CLV Podcast*
23	**11/17**	**Midterm Exam II**	
24	11/19	Digital Marketing and Attribution	
25	11/24	Machine Learning and AI	
	11/26	*No Class – Thanksgiving break*	
	11/30	**Assignment 3 Due**	
26	12/1	Text Analysis	
27	**12/3**	**Presentations (Project)**	
28	**12/8**	**Presentations (Project)** Course wrap-up	

12/15 – 12/22 Final exam week