MKTG 2120: Data and Analysis for Marketing Decisions

2023 Fall

(updated: 11/14/2023)

Lectures:

Section 1: T/R 10:15-11:45am @ SHDH 107

Section 2: T/R 3:30-5:00pm @ SHDH 211

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

Office hour: Tuesdays 2-3pm JMHH 747

Teaching Assistants:

- Henrique Laurino dos Santos (hlauri@wharton.upenn.edu)
  - Office hour Fridays 2-3pm (starting Sep 1): https://upenn.zoom.us/j/96354893302?pwd=QnlHREdEbnk1OUpqazdOUE9KK01Ndz09
- Michael Li (msli@upenn.edu)
  - Office hour Fridays 3-4pm (starting Sep 8): https://upenn.zoom.us/j/96193827160

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

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, and all lecture slides 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 Ed Discussion, which is available through Canvas. 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.

- 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.

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. You may use whatever software you like to do homework. 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. 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:

- 30% - Exams
    - 15% = Midterm 1
    - 15% = Midterm 2
- 30% - Assignments
- 15% - Weekly quiz
- 15% - Group project
- 10% - Participation

Exams:

There will be two midterms. These are individual exams. The two midterms will be done during class. Midterm 2 is not cumulative. The exams will be administered through Canvas. There will not be a final exam. **No coding (Excel or R) will be required during the exams.**

Only SDS-approved exam accommodations will be accepted. If you have SDS-approved exam accommodations, it is your responsibility to make me aware of these, and to make sure they appear in Canvas before taking your exams.

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).

You have the option of working in a group for all of the assignments. Groups may be up to five students. You may also work individually. There is no need to stay with the same group for all of the assignments. Groups must be reported to the TAs at least one week before the assignment is due. One person from your group should email the TA the full list of group members, with names as they appear on Canvas, by 11:59 PM one week before the assignment is due. Once your group is sent to the TAs, you may not change your group for that assignment.

If you do not submit a group to the TAs at least one week before the assignment is due, then we will assume you are doing the assignment on your own. We will not carry-over the groups from assignment to assignment.

Project:
Similar to assignments, you can work in a group up to 5 students for the project. In the project, you will explore something that is of interest to you. You will apply the methods learned in class to an interesting dataset or marketing problem. You can also use a method that may be useful to marketing managers, but was not covered.

The deliverable of the project will be an in-class presentation. These will be graded on how relevant they are to the course, and on the quality of the presentation. **Groups for the final project must be reported to the TAs at least two weeks before the final presentation date.**

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.

Participation:

Students are expected to come to class and respond to the in-class surveys using Poll Everywhere. You may miss up to three classes with no penalty, for any reason. After that, each absence will detract from your participation score.

Actively engaging with the class during in-class discussions will improve your participation score, even if your attendance is less than 100%.

Grade Curve:

Final grade will be curved. The tentative cut-offs for determining your final letter grade are:

A (4.0)	15%
A- (3.7)	25%
B+ (3.3)	25%
B (3.0)	15%
B- (2.7)	10%
C+ (2.3)	5%
C or below	5%

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.

Tentative Course Schedule

bold = deliverable/required; *italics* = optional

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

1	8/29	Course Introduction	*AKLD Ch. 3-4*
2	8/31	Focus Groups and Interviews	*AKLD Ch. 8-10*
3	9/5	Surveys	*AKLD Ch. 11-12, 14-15*
4	9/7	Secondary Data	
5	9/12	Experimentation I	*AKLD Ch. 13*
6	9/14	Experimentation II	

	9/15	**Assignment 1 Due**	
7	9/19	Statistical Testing I	*AKLD Ch. 17-18, CF Ch. 6*
8	9/21	Class canceled	
9	9/26	Statistical Testing II	
10	9/28	Linear Regression I	*AKLD Ch. 19, CF Ch. 7*
11	10/3	Linear Regression II	
12	10/5	Midterm 1 Review	
	10/6	**Assignment 2 Due**	
13	**10/10**	**In-class Exam I**	
	10/12	*No Class – Fall Break*	
14	10/17	Logistic Regression I	*CF Ch. 9, 13*
15	10/19	Logistic Regression II	
16	10/24	Customer Lifetime Value	*Planet Money CLV Podcast*
17	10/26	Cluster Analysis I	*AKLD Ch. 20, CF Ch. 11*
	10/27	**Assignment 3 Due**	
18	10/31	Cluster Analysis II	
19	11/2	Factor Analysis	*AKLD Ch. 20, CF Ch. 8*
20	11/7	Application: Cluster and Factor Analysis	*AKLD Ch. 21, CF pp. 246-252*
21	11/9	Conjoint Analysis I	
22	11/14	Conjoint Analysis II	
23	11/16	Choice-based Conjoint	*CF Ch. 13*
	11/17	**Assignment 4 Due**	
24	11/21	Text Analysis	
	11/23	*No Class – Thanksgiving break*	
25	11/28	Midterm 2 Review	
26	**11/30**	**In-class Exam II**	
27	**12/5**	**Group presentation**	
28	**12/7**	**Group presentation**	