

**The Wharton School
University of Pennsylvania**

**Models for Marketing Strategy
MKTG 2710/7710**

Fall 2023

Christophe Van den Bulte
Office hours: Th 2:00-5:00, JMHH 759 & by appointment
Class meetings: Tu/Th 10:15-11:45, JMHH 70

Tel: 215-898-6532
E-mail: vdbulte@wharton.upenn.edu

Course objective

The course will develop your skills in using analytics to make marketing decisions. Compared to other courses in marketing analytics, the focus is less on “what is happening?” or “what will happen?” and more on “what should we do?” I.e., the course develops your skills to go from descriptive and predictive analytics to prescriptive analytics.

For instance, in the area of marketing mix decisions, rather than only learning “how do sales of our five products tend to change as price and advertising levels change?” or forecasting “how are sales and profits of our five products likely to change if we increase our prices by 12% and our advertising by 24%?”, we will proceed to the decision “what should the price and advertising level be for each of our products, taking into account that we can spend at most \$180,000 in each quarter?”

As another example, in the area of new product design using conjoint analysis, we will not only ask “how do customers trade off price, power and warranty?” but proceed to the decision “what should our price, power and warranty be?”

The course requires familiarity with Excel and linear regression from the very first day, but is otherwise self-contained. No prior experience with marketing analytics is required.

We will cover a variety of models and tools. These will allow us to tackle challenges in four main areas. Ordered roughly by increasing level of complexity, these are:

- Marketing mix modeling & optimization
- Choice modeling, conjoint analysis, and market simulators
- Modeling elements of customer lifetime value
- Some challenges in analyzing A/B and A/B/n tests

Class recordings

All classes will be recorded, and accessible through Canvas without special permission.

Prerequisites

For Wharton students:

MKTG2710: MKTG101, STAT101, knowledge of regression (e.g., STAT102 or 112)

MKTG7710: MKTG611, STAT611, knowledge of regression (e.g., STAT613 or 621)

For non-Wharton students:

If you have a quantitative orientation and some knowledge of marketing, you likely have the skills and outlook to succeed in this course. Please contact me at vdbulte@wharton.upenn.edu and we'll discuss if the course is a good match for you.

Cross-listing of MKTG 2710 and 7710

The course is cross-listed across the undergraduate and graduate programs. However, the flow of the sessions accommodates the smaller number of sessions in the graduate program without requiring make-up work by students enrolled in 7710.

Software

The course is designed to develop your skills in using quantitative models to address business problems rather than your skills in software coding. We will therefore be using Excel and JMP, two programs with which Wharton students are already familiar. A licensed version of JMP Pro is available for download through the Canvas course site, under the “Modules” tab.

If you are already comfortable with R, Python, SAS or Stata, you are very welcome to use any of these rather than JMP. I will provide full support only for Excel, JMP and SAS.

Course materials

Readings, handouts, data files, code and cases will be made available through the course Canvas site. This includes two course packs distributed by Study.net.

Course pack A is required for both 2710 and 7710. Course pack B is required only for 2710 as it contains cases that we will (or may) discuss on “2710-only days.”

If you would like to complement those materials with an optional textbook, I suggest:

Principles of Marketing Engineering and Analytics. 3rd ed. by Gary L. Lilien, Arvind Rangaswamy and Arnaud De Bruyn, 2017.

Using electronic devices in class

Using electronic devices in class tends to distract both you and your fellow students. But some uses can be justified, especially for a course like this. So, here is the policy we'll start with:

Phones: No.

Tablets: For note-taking.

Laptops: For in-class exercises or case discussion involving data analysis.

Let's start with this policy, see how it works, and amend it if and when needed.

Grading

I will use grades to reward you for not only your mastery of the materials, but also your engagement as it fosters learning both by yourself and your fellow students. Here are the weights:

Engagement, incl. Pre-class submissions	20%
Homework / Problem sets	20%
In-class assessments/tests	60%

What you are rewarded for engagement, not attendance. There is no direct penalty for not attending.

Homework / problem sets and pre-class submissions are meant to help you learn, which is often fostered by a mixture of working alone and in small teams. Unless explicitly stated that an assignment must be completed individually, I encourage you to collaborate with a few fellow students. Note, I don't encourage the "divide and conquer" approach where each team member works only on a single problem. That may minimize effort, but also minimizes learning.

Pre-class submissions will be listed as "Quizzes" on Canvas and will be displayed as counting for "1 point". The latter is just Canvas logistics. These submissions are your answer(s) to some case preparation question(s), and will be graded for participation rather than "quality," let alone "being correct." The only exception are answers that seem clearly non-justifiable to me and that still do so after class because they were not given a reasonable justification during the discussion. When I tally all the various ways in which students contributed, I expect that each pre-class submission will count for slightly more than 1 point out of 100.

Two assessments/tests will be held in class over the course of the semester, on 10/5 and 12/5.

For undergraduates (2710), there is no grading curve. For graduate students (7710), there is no grading curve beyond whatever constraints are imposed by the MBA Program.

Schedule of sessions

Date	Session #			
	UG	MBA		
A. Marketing Mix Modeling (MMM)				
8/29	1	1	Introduction	<i>Keurig</i>
8/31	2	2	Regression for MMM	
9/5	3	3	MMM & Optimization: Statics I	<i>Georgia Aquarium</i>
9/7	4	4	MMM & Optimization: Statics II	
9/12	5	5	MMM & Optimization: Dynamics I	<i>Oranzada Pow!</i>
9/14	6	6	MMM & Optimization: Dynamics II	
9/19	7	7	MMM & Optimization: Dynamics III	
9/21	8	8	More Questions (and Answers) about MMM	
B. Choice Modeling, Conjoint Analysis & Market Simulators				
9/26	9	9	Binary Logit I	<i>Star Digital</i>
9/28	10	10	Binary Logit II	
10/3	11	11	Multinomial Logit & Choice Modeling	
10/5	12	12	In-class assessment #1	
10/10	13		Case – Using both Qual & Quant Analytics	<i>L'Oréal Plénitude</i>
10/17	14		Debrief of in-class assessment #1	
10/19	15		TBD by UG students (extra case, hands-on exercises on logit modeling, ...)	
10/24	16	13	Choice-Based Conjoint Analysis & Simulators	
10/26	17	14	Choice-Based Conjoint Analysis & Simulators	
10/31	18	15	Choice-Based Conjoint Analysis & Simulators	<i>Montclair Video</i>
C. Modeling Elements of Customer Lifetime Value				
11/2	19	16	Modeling Durations (Adoption & churn)	
11/7	20	17	Modeling Durations (Adoption & churn)	
11/9	21	18	Managing CLV	
D. Topics in A/B/n testing & MMM				
11/14	22	19	Analyzing differences between groups & interactions using regression	
11/16	23	20	Case – A/B Test for Customer Acquisition	<i>Artea</i>
11/21	24	21	Special challenges in analyzing A/B and A/B/n tests	
11/28	25	22	Endogeneity: MMMs often under-estimate price and over-estimate adv. effects	
11/30	26	23	Wrap-up	
12/5	27	24	In-class assessment #2	
12/7	28		TBD by UG students (debrief of assessment #2, hands-on exercises, ...)	

Names in italics refer to traditional cases. We will discuss many more applications in class, including customer targeting at ABB Electric, salesforce allocation at Syntex Labs, an experiment at ZipRecruiter assessing how price affects acquisition and retention, a conjoint study assessing what features boost acceptance of COVID-19 boosters, an experiment at Walmart assessing how various text messages increase vaccine uptake among Walmart customers, and an analysis of 2,700+ A/B/n tests on Optimizely.