Course Syllabus and Schedule

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Office Hours: Tuesday, 3:30PM-4:30PM, JMHH 756

Recommended Books:  
Data Science for Business  
Foster Provost and Tom Fawcett, O’Reilly Media, August 2013  
An online version of this book can be accessed through O’Reilly’s Safari service.  
R for Data Science  
Hadley Wickham and Garrett Grolemund, O’Reilly Media, January 2017  
An online version of this book can be accessed through O’Reilly’s Safari service.

Required Bulkpack: Contains assigned cases and readings.

Prerequisites MKTG 611 and STAT 613; Knowledge of an advanced statistical package like R, Python, Stata or SAS.

Software: I will use and demonstrate R but you may prefer to use another advanced package such as the ones mentioned above.

Course Website: Canvas

Group Assignments: (i) There will be 3 group assignments due during the semester.  
(ii) Group formation is discussed below.

Guest Speakers: There will be 1-2 Guest Speakers during the course.
Course Objectives

Companies are currently spending millions of dollars on data-gathering initiatives, but few are successfully capitalizing on all this data to generate revenue and increase profit. Converting data into increased business performance requires the ability to extract insights from data through analytics.

This course covers the three pillars of analytics – descriptive, predictive and prescriptive – within the marketing context.

Descriptive Analytics examines different types of data and how they can be visualized, ultimately helping you communicate your findings and strengthen your team’s or organization’s decision making.

Predictive Analytics explores the use of data for forecasting. You will learn to utilize various tools, including regression analysis, to estimate relationships among variables and predict future behavior.

Prescriptive Analytics takes you through the final step — formulating concrete recommendations. These recommendations can be directed toward a variety of marketing actions, including pricing and social-platform outreach.

Students will be exposed to several methods such as linear regression, logistic regression, multinomial regression, machine learning methods (e.g., neural networks and Support Vector Machines). We will learn how to employ these methods for such managerial decisions as demand forecasting, pricing, and valuing customers.

Overall, you will develop a data analytics mindset, learn new tools, and understand how to convert numbers into actionable insights

Course Materials and Approach

My overall philosophy is there is no better way of developing an understanding of marketing analytics than “learning by doing”. In the course we will use a variety of readings, cases and exercises. The readings and cases are contained in the course bulk pack. Lecture notes and any additional handouts will be made available through Canvas. Please read any assigned reading and cases before coming to class.

Comparison with Data and Analysis for Marketing Decisions (MKTG 712)

MKTG 852 will differ from MKTG 712 in the breadth and depth of coverage in three main areas (1) data collection, (2) predictive data analysis, and (3) stated choice experimentation / conjoint analysis.

(1) Data collection: MKTG 712 devotes a significant amount of time to primary data collection (surveys, focus groups) including sessions on basic hypothesis testing (given the broader audience of MKTG 712). In contrast, MKTG 852 focuses on
quantitative analysis after data is collected, especially detailed customer-level transaction data and marketing mix data that the firm already has access to. Thus, MKTG 712 provides students with a broad perspective on the many venues for data collection using traditional marketing research methods; whereas MKTG 852 focuses on data analysis, especially of transaction data.

(2) Data Analysis: MKTG 712 covers descriptive multivariate methods like clustering and factor analysis. It focuses little on predicting outcomes. In contrast, MKTG 852 goes much deeper into predictive analytics, specifically using machine learning models (e.g., random forests, neural networks, Support Vector Machines).

(3) Stated choice experimentation / Conjoint analysis: MKTG 712 covers conjoint analysis from the perspective of a manager using the results. MKTG 852, in contrast, covers these methods in a lot more depth, from the perspective of a data analyst.

Assessment

Your final grade will be based on class participation (case preparation and general contribution), written assignments, and a final examination. The evaluation is as follows:

A. Class Participation 20%
B. Group Assignments 40%
C. Final Examination (individual) 40%

Please note that no late assignments will be accepted. All written work is due on the specified date. The due dates for the assignments are listed on the course schedule. A more detailed outline of the evaluation procedure and requirements for A through C is included at the end of this document. Please also read Section D on the electronic device policy.

Group Formation

Students must organize themselves into groups of 3 to 5 people in order to do the group assignments.
## Schedule of Class Meetings

<table>
<thead>
<tr>
<th>Lecture #</th>
<th>Topic, Readings, Cases</th>
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| **1**     | **Descriptive Analytics**  
            | **New Marketing Data and Better Science**  
            | Reading: “Data Science…”  
            | Reading: “The Rapid Adoption…”  
            | Reading: “The Age of Analytics…”  
| **2**     | **Business Experiments**  
            | Reading: “A Step by Step Guide…”  
            | Reading: “The Perils of Proactive…”  
            | Reading: “Seven Rules…”  
| **3**     | **Predictive Analytics**  
            | **Regression Models – I**  
            | Reading: Advanced Regression Models  
| **4**     | **Regression Models – II / Story Telling with Data and Analysis**  
            | Application: Demand Forecasting at L’Occtane  
| **5**     | **Prescriptive Analytics / Applications**  
            | **Logistic Regression**  
            | Reading: Advanced Regression Models  
| **6**     | **Logistic Regression –II**  
| **7**     | **Guest Speaker - I**  
| **8**     | **Multinomial Regression - Pricing Analytics-I**  
            | Reading: “A Conjoint Model for Quantity Discounts  
| **9**     | **Multinomial Regression - Pricing Analytics-II**  
| **10**    | **Guest Speaker - II**  
| **11**    | **Social Network Analytics**  
            | Reading: “Opinion Leadership and Social Contagion…”  
            | Reading: “Predicting Individual Behavior…”  
            | Reading: “Deriving Value from Social…”  
| **12**    | **Machine Learning Models**  
            | Reading: “What can Machine Learning…”  
            | Reading: “How Analytics and Machine Learning…”  
| **13**    | **Social Media Analytics**  
            | Reading: “The Structure of Online…”  
            | Reading: “Social TV: Real-Time Social Media …”  
| **14**    | **In Class Exam**  

Assessment Details

A. Contribution to Class Discussion (20%)

I expect you to be on time to class. I will “cold call” throughout the ensuing discussion. Please be prepared. I will take attendance every session. If you miss more than three sessions, you will be given an F in the class.

I will evaluate you on how well you respond to questions and on how effectively you take into account the comments and analyses of your classmates. Please do not simply take up air time. In order to obtain a grade for class participation you must attend the class sessions and contribute meaningfully.

B. Group Assignments (40%)

The assignments will be put in Canvas. There will be three assignments. Deadlines will be strictly enforced. You will receive a 0 on an assignment if you submit after the deadline.

(1) Insights from Regression Analysis – This assignment will require students to describe the results from a regression analysis in terms of its managerial actionability. It will also allow students to appreciate the differences between correlational results and causation. 10%

(2) Models and Predictions – This assignment will require students to build prediction models for customer demand for car rentals using different types of models. They will compare the predictive accuracy of different models and explain why they differ. 15%

(3) Conjoint Analysis and Optimal Pricing – This assignment will require students to analyze a choice-based conjoint dataset, infer customers’ willingness to pay and make recommendations on product design and pricing. It will also require students to develop market-level simulations to determine the share of new products. 15%

C. Individual-level Final Examination (40%)

D. Electronic Device Policy: The Wharton School’s policy is not to allow the use of Electronic Devices in MBA classes, unless specifically permitted. Please see the electronics in the classroom policy: [https://mba-inside.wharton.upenn.edu/wharton-mba-academic-policies/](https://mba-inside.wharton.upenn.edu/wharton-mba-academic-policies/)
This course completely adheres to that policy. Consequently, make sure any electronics (e.g., phone, laptop or tablet) are shut off and put away, unless explicitly instructed otherwise.

If you are observed using any electronics in class without permission once, your course grade will be decreased by one full letter (e.g., A to B, B- to C-). If you are observed doing so twice, your course grade will be F.
Readings:


9) Brand Loyalty at URBN. In the process of being written.


