MKTG 5740: Marketing and Business Analytics
College of Business Administration
University of Missouri-St. Louis
Fall 2019

Instructor: Dr. Ho Kim, Assistant Professor of Marketing
Office: Anheuser Busch Hall #222
Office Hours: By appointment
Phone: 314-516-6298
Email: kimho@umsl.edu
Class Schedule: Weekly schedule varies depending on the class format.
• Fully Face-to-face: Wednesday 6:00 – 8:30 (ABH 005)
• Fully Online: Throughout the week (on Canvas)
• Half Online/Half Face-to-Face (Flipped classroom): Wednesday 6:00 – 7:30 (ABH 005)

Description in the Course Catalog
Prerequisites: MKTG 5700 and LOG OM 5300. A broad approach to marketing research as a model for acquiring, retrieving, and analyzing decision-making information. Includes market measurement, evaluation of sales and cost effectiveness, sales forecasting and primary marketing research studies aimed at solving specific problems. Emphasis is placed also on building a theoretical and analytical framework to provide flexibility in the design of marketing experiments and in judging recent research innovations.

Focus of the Course
Considering the significant impact of big data and analytics, this course will be focused on analyzing and making sense of market data collected at various levels. Students will learn data munging skills (e.g., merging two data sets, selecting a subset of observations) and data analysis methods (e.g., A/B testing, regression). Students will also have hands-on experience of data munging and analysis real-world cases. R will be the main software of the course.

Course Objectives
The course will help students achieve the following objectives:
1. Develop analytical thinking skills necessary to handle marketing and business data
   a. Define business problems
   b. Formulate the business problems into analytical questions
   c. Solve analytical questions by analyzing data
   d. Find business insights from analytical solutions
2. Improve the ability to think critically and analytically
3. Understand the role of analytical techniques and show how they can enhance quality of strategic decision making
Course Topics

- Data Munging/Wrangling
- Data Summary and Visualization
- Causality (Experiments and A/B Testing)
- Drivers of Market Outcomes (Regression Analysis)
- Individual Consumers’ Choice Decisions (Logistic Regression)
- Predictive Analytics Using Machine Learning (Random Forests, Extreme Gradient Boosting, Cross-validation)

Learning Method
The weekly sessions consist of a lecture, data analysis exercise, and case analysis. The lectures teach basic statistical/machine learning concepts and methods. The data analysis exercises, using simple data sets, provide opportunities to practice the concepts and methods learnt in the lectures. The case analyses offers real-world business problems that can be solved with the methods learnt in the lectures. The data analysis exercises and case analyses are bundled with data.

Most of weekly sessions will be in flipped classroom format. In a flipped classroom week, the lecture will be given in videos posted on Canvas at the beginning of the week. You should study the lecture through the videos before coming to the Wednesday face-to-face session. In the classroom on Wednesday, we will spend most of our time on discussing and analyzing the given cases. As such, it is essential to watch the videos and study yourself before coming to the class.

Course Materials

- **Software Programs: R, RStudio, and Tableau.** R and RStudio are the main software program that we will use in this course. R is an open source software program for data analysis and visualization. RStudio is a user-friendly interface for R. We use Tableau mainly for data visualization. The advantage of Tableau is its easy-to-use (and relatively quick-to-learn) visualization capabilities.

- **Lecture slides:** Lecture slides will be posted on Canvas during the weekend before the respective sessions.

- **Cases and data sets**
The following materials are required for classroom activities and homework assignments. They are included in the course pack, available for purchase at [https://hbsp.harvard.edu/import/651724](https://hbsp.harvard.edu/import/651724).


- **Optional books**
  These optional books may help you understand R and Machine Learning.

**Grading**
The final course grade will be determined as follows:

- **Individual (60%)**
  - Class participation 10%
  - Individual assignment 30%
  - Final exam 20%

- **Team (40%)**
  - Group assignment 20%
  - Team Project 15%
  - Peer Evaluation 5%
- Class participation (10%)
  Please read the assigned case before the class starts and be ready for discussion. I will reward your participation when deciding your final letter grade.

- Assignments (Individual 30%, Group 20%)
  There will be three individual assignments and three group assignments. For the assignments, you are expected to use appropriate analysis methods to analyze the given data sets and interpret the results for business insights (You will learn the necessary analysis methods in the class. No worries). You can find the assignment deadlines in the course schedule section of this syllabus.

- Exam (20%)
  You will have one exam in Week 16. It is an open-book, take-home exam administered on Canvas.

- Team Project (15%)
  Teams will conduct a term project that applies machine learning methods to predict consumer behavior.

- Peer Evaluation (5%)
  You will have a survey at the end of the semester to evaluate your team members’ contribution to group assignments and term project.

## Grading Scale

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>100 – 94</td>
<td>A</td>
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<tr>
<td>93.99 – 90</td>
<td>A-</td>
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<tr>
<td>89.99 – 87</td>
<td>B+</td>
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<td>86.99 – 84</td>
<td>B</td>
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<td>83.99 – 80</td>
<td>B-</td>
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<td>79.99 – 77</td>
<td>C+</td>
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<td>66.99 – 64</td>
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<td>D-</td>
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<td>60.99 – 0</td>
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## Computer Policy

Please bring your own laptop PC to the classroom for data analysis.

## Weekly Reading and Videos

- Week 1: Introduction to Analytics (fully face-to-face)
  - Lecture Slides: Introduction to Analytics
- Week 2: Summarizing and Visualizing Data I (flipped classroom)
  - Lecture Slides & Videos: Exploratory Data Analysis I

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1 The flipped classroom means the half online/half face-to-face format. Students are expected to watch lecture videos before coming to the classroom.

• Week 3: Introduction to R (fully online)
  - Lecture Slides & Videos: Introduction to R

• Week 4: Summarizing and Visualizing Data II (flipped classroom)
  - Lecture Slides & Videos: Exploratory Data Analysis II

• Week 5: Experiments and A/B Testing (flipped classroom)
  - Lecture Slides & Videos: A/B Testing

• Week 6: Linear Regression I: Concepts and Ideas (online)
  - Lecture Slides & Videos: Concepts of Regression Analysis

• Week 7: Linear Regression II: Basic Linear Regression Models (flipped classroom)
  - Lecture Slides & Videos: Basic Liner Regression Models

• Week 8: Linear Regression III: Advanced Topics (flipped classroom)
  - Lecture Slides & Videos: Advanced Topics in Regression Analysis
  - Pfeifer, Phillip E. and Greg Mills (2009), “Sarah Gets a Diamond,” Darden School of Business

• Week 9: Logistic Regression I: Basics of Logistic Regression (flipped classroom)
  - Lecture Slides & Videos: Logistic Regression Models
  - Ovchinnikov, Anton (2014), “Predicting Customer Churn at QWE Inc.,” Darden School of Business

• Week 10: Logistic Regression II: Advanced Topics (flipped classroom)
  - Lecture Slides & Videos: Advanced Topics in Logistic Regression

• Week 11: Machine Learning I: Introduction (fully online)
  - Lecture Slides & Videos: Concepts and Ideas

• Week 12: Machine Learning II: Tree-Based Methods (flipped classroom)
  - Lecture Slides & Videos: Tree-Based Methods

• Week 13: Machine Learning III: Extreme Gradient Boosting (flipped classroom)
- Lecture Slides & Videos: XGBoost
- Week 14: Course Summary (face-to-face)
  - Lecture Slides: Course Summary
- Week 15: Thanksgiving Holiday Week (No Class)
- Week 16: Final Exam (Open-book, take-home exam)
  - Final exam on Canvas
- Week 17: Term Project Presentation
  - Prepare your report and presentation slides.
<table>
<thead>
<tr>
<th>Week (class format)</th>
<th>Topic (class format)</th>
<th>Required Reading and Videos</th>
<th>Assignment (Due before the class unless stated otherwise)</th>
</tr>
</thead>
</table>
| 1 (8/21)            | Course Overview: Introduction to Analytics (fully face-to-face) | • Lecture Slides: Introduction to Analytics  
• Gallo (2018), “4 Analytics Concepts Every Managers Should Understand”  
| 2 (8/28)            | Summarizing and Visualizing Data I (flipped classroom)2 | • Lecture Slides & Videos: Exploratory Data Analysis with MS Excel  
• Maclean (2016), “Descriptive Statistics in Microsoft Excel”  
| 3 (9/4)             | Introduction to R (fully online) | • Lecture Slides & Videos: Introduction to R  
| 4 (9/11)            | Summarizing and Visualizing Data II (flipped classroom) | • Lecture Slides & Videos: Exploratory Data Analysis with R and Tableau  
| 5 (9/18)            | Experiments and A/B Testing (flipped classroom) | • Lecture Slides & Videos: A/B Testing  
• Luca, Dai, & Kim (2016), “Advertising Experiments at RestaurantGrades” | Assignment #3 (Individual): RestaurantGrades |
| 6 (9/25)            | Regression Analysis: Concepts and Ideas (fully online) | • Lecture Slides & Videos: Linear Regression I  
• Bell (1993), “Regression Analysis” | |
| 7 (10/2)            | Regression Analysis: Basics of Linear Regression (flipped classroom) | • Lecture Slides & Videos: Linear Regression II  
• Cohen & Wallace (2003), “A-Rod: Signing the Best Player in Baseball” | |

2 The flipped classroom means the half online/half face-to-face format. Students are expected to watch lecture videos before coming to the classroom.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Lecture Content</th>
<th>Assignment</th>
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</table>
| 8     | Regression Analysis: Advanced Topics (flipped classroom)  | • Lecture Slides & Videos: Linear Regression III  
• Cohen & Wallace (2003), “A-Rod: Signing the Best Player in Baseball”  
• Pfeifer & Mills (2009), “Sarah Gets a Diamond” | Assignment #4 (Group): Sarah Gets a Diamond |
| 9     | Understanding Decisions of Individual Consumers I (flipped classroom) | • Lecture Slides & Videos: Logistic Regression I  
• Ovchinnikov (2014), “Predicting Customer Churn at QWE Inc.” | Assignment #5 (Group): QWE |
| 10    | Understanding Decisions of Individual Consumers II (flipped classroom) | • Lecture Slides & Videos: Logistic Regression II  
| 11    | Machine Learning I (fully online)                        | • Lecture Slides & Videos: ML I                                                 |                                                |
| 12    | Machine Learning II (flipped classroom)                  | • Lecture Slides & Videos: ML II                                               |                                                |
| 13    | Machine Learning III (flipped classroom)                 | • Lecture Slides & Videos: ML III                                              |                                                |
| 14    | Course Wrap-Up (fully face-to-face)                      | • Lecture Slides: Course Summary                                               |                                                |
| 15    | Thanksgiving Holiday (No Class)                          |                                                                                   |                                                |
| 16    | Final Exam (fully online)                                |                                                                                   |                                                |
| 17    | Team Project Presentation (fully face-to-face)            |                                                                                   |                                                |