MKTG 955: Digital Marketing Analytics

Professor: Jennifer Cutler  
Office: Global Hub 5421  
Email: Jennifer.Cutler@kellogg.northwestern.edu  
Office hours: by appointment

Course Website: (Canvas) http://canvas.northwestern.edu/  
Class locations: TBA

Meeting times: TBA

Homework Labs: Most weeks, I will hold an optional Homework Lab. Unless otherwise announced, I will not cover any new material in these, nor will I formally review material. They are intended as a place for you to come and work on assignments and ask questions as you go along if you get stuck. These sessions can be particularly helpful if you are using Tableau and/or R for the first time and find yourself struggling with the interface.

Note: This syllabus is tentative and subject to change.

Course Description
In this digital age, there is an unprecedented volume, velocity, and variety of marketing data available to firms. User characteristics and behaviors are tracked in detail for websites, social media pages, and ad campaigns, and information-rich user-generated content is contributed at breakneck speed throughout the web. The marketing world is a-buzz with excitement about using this “big data” to increase profits – yet, many marketers find real, measurable value-gain to be elusive. It is all too easy to suffer “analysis paralysis” in the face of a sea of metrics; to make misinformed recommendations based on flawed data or analytics; or in invest in an analytics tool that makes strong promises but doesn’t deliver actionable insights.

The goal of this class is to prepare students to be effective marketing leaders in a landscape that involves digital initiatives and data. Students will learn to evaluate different analytics approaches and will gain hands-on practice gathering and analyzing large digital data sets containing both structured and unstructured data. Students will gain experience addressing questions such as: “What is the ROI of my social media initiative?”, “How should I target my paid ads?”, “What are users saying about my brand?”, and “Should I invest in this new analytics tool?”

Specifically, this course is designed to help students develop:

- A working knowledge of the current digital marketing ecosystem, common strategic goals of digital marketing, and types of data typically available for analysis.
• A conceptual understanding of the data analytics process to enable designing analytics plans, collaborating with data scientists, and applying skills in novel contexts.
• Facility working hands-on with large data sets, applying a range of techniques to extract insights from both quantitative and qualitative data.

Course Contents
The course will cover digital marketing topics including:

• **Digital Advertising**: Display, search, and social media advertising ecosystems; common metrics and defining KPIs; attribution; evaluating ROI and allocating funds; segmentation and targeting.
• **Search Engine Optimization**, content marketing, search analytics
• **Website Analytics**: common metrics, dimensions, and KPIs; micro and macro conversions; cross-channel attribution models
• **Social Media Marketing**: defining goals and measurement plans; evaluating ROI; improving post performance.
• **Social Listening**: share of voice, sentiment analysis, topic classification, and other approaches for using user-generated content to inform marketing research and monitor brand image; assessing the accuracy and tradeoffs of different text-mining approaches; identifying and targeting potentially influential users.

In each of these areas, students will gain an understanding of the types of data available; how to assess the quality of the data; how to develop a goal-based analytics plan; and how to make sound inferences and recommendations. Students will gain facility with platforms, tools, and measures that are current industry standards, as well as learn enduring analytical skills that will transcend changes as the digital marketing landscape evolves.

We will primarily use the following tools for data analysis:

• **Excel**
• **Tableau** for exploring highly-dimensional data and reporting. (No prior experience with Tableau required.)
• **R** for collecting social media data and for performing text analysis. (No prior experience with R, social APIs, or text analysis required.)

Additionally, students should have comfort with techniques taught in Business Analytics (such as hypothesis testing and regression analysis—see prerequisites), and have an ability to perform these in the tool of their choice (e.g., Stata).

**What this course is not:**
“Digital marketing analytics” is a broad umbrella, and a wide range of substantive and technical areas could fit under this title. For this reason, I’ve added this section about what the course does NOT cover, so you can make a more informed decision about whether this course is the right fit for you.
• This course is not a deep-dive into a specific digital marketing platform or strategy. Rather, this a survey course: over the 10 weeks, you will get an introduction to a wide range of digital platforms, strategies, and analytics approaches.

• This course is not a practicum for running live digital campaigns. Students interested in getting hands-on practice with live websites are encouraged to take Entrepreneurial Tools for Digital Marketers.

• This course is not a statistics course. Students are expected to already understand techniques covered in Business Analytics (such as hypothesis testing and regression analysis), and this knowledge will be assumed in class discussions. If additional statistical methods are taught, it will be at a conceptual-level only. We will, however, learn new technical skills, such as querying social media APIs, classifying and structuring text data, and manipulating and visualizing large data sets. Students interested in learning to perform new predictive modeling techniques are encouraged to take Customer Analytics.

Pre-requisites
This course is designed to be taken after students have had a thorough introduction to both marketing strategy and business statistics. These requirements could be filled by taking the Business Analytics sequence and a Marketing Strategy course, or through equivalent experience. While understanding techniques such as hypothesis testing and regression analysis is required, more advanced analytics experience is not necessary; the class is designed to be accessible to students who seek to be data-literate even if not specializing in analytics. Prior experience in digital marketing is not required (though useful). If you are unclear whether you have an appropriate background, contact the professor.

Additional note: in the spring 2017 and winter 2018, a similar course entitled “Digital Marketing Strategy” was also offered. As neither course requires any background in digital marketing, both courses provide an overview of and introduction to core aspects of digital marketing. It is not recommended that students take both courses, but rather pick one or the other, depending on whether they are interested in a survey course that focuses more on strategy or analytics (though both courses will cover aspects of both).

Materials

Textbook: (Note: the textbook info may be updated for Spring 2018. Any updates will be indicated both on the syllabus and on Canvas by March 19th, 2018. Prospective Spring enrollees are advised not to buy the textbook until then.)
We will use a digital textbook called Stukent Digital Marketing Essentials. Access to the book costs $60 for a year-long license. Although the digital format may take some getting used to, the advantages of the format include that the authors can keep the material up-to-date as the digital landscape changes.

For the purposes of this class, this book is intended as a reference for providing you with a working knowledge of how the key platforms involved in
digital marketing today work, as well as some of the common metrics that are reported. We will not cover much of this material directly in class, but rather it will serve to provide you with the background and vocabulary that will enable productive discussion of analytics in the classroom.

To purchase and access the textbook, click on [this link](#) and follow the instructions to register. The book we will use is the Digital Marketing Essentials Textbook (you can ignore the other options).

I suggest that you bookmark this link for easy access throughout the course. There will be no reading from the textbook due the first day of class; you are welcome to wait to purchase the textbook until after the first class.

**Course Packet:** A course packet of cases will be posted to [Study.net](#) to be used for assignments and discussions.

**Additional Materials:** Additional materials will be posted to Canvas.

**Laptop:** Students are required to bring a laptop to each class to use during exercises.

**Software:** For analytics, the following desktop applications are required: Excel, Tableau, and R. Although Stata is not strictly required to complete the course, you are expected to have familiarity with it, and you will likely find it helpful.

**Installing Tableau.** Tableau is an industry standard tool for data exploration and reporting, and they provide a free year-long academic license to students. To install the latest version, click on [this link](#) and select “Get Started”. On the form, enter your university email address for “Business email” and the name of your school for “Organization”. Use the following Desktop Key: TBA.

Tableau also provides a public version of their tool with no licensing fee. This will enable you to continue to use Tableau after your license expires. However, in the public version, all data that you analyze is made public. Because some of the data we will be using in class is protected, you must use the Desktop version for these projects.

**Installing R and R Studio.** R is an open-source platform widely used in industry for data analysis. Install the latest version of R [here](#). Then, install R Studio [here](#). R Studio provides an interface that makes working with R much easier. You are not expected to know how to use R in advance; we will walk through the steps needed to complete the required tasks. This course will not provide deep instruction on using R, but it will expose you to the platform and show you how to use it for a few kinds of tasks.

We may also use various free cloud-based tools throughout the quarter, and students may be required to set up accounts. Instructions will be provided as the course progresses.
Social Media
Students are required to have a Facebook and Twitter account, and they must be able to validate the Twitter account with a mobile phone number. This is necessary in order to gain authentication to query the Twitter API. Instructions will be provided.

We will also make use of ForClass. Links will be provided in Canvas to enroll.

Grading
Grades will be based on participation, homework, quizzes, a group final project, and an individual take-home final exam. The final exam, as well as any quizzes, will be open note, open book. A more detailed breakdown of the grading schema will be presented at the start of the quarter.

Detailed Schedule
The schedule detailed below describes the course schedule in Spring 2017, and provides a general picture for the course progression. However, the topics and schedule details may be updated for Spring 2018. A link to an updated schedule will be provided by the first day of class.

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<thead>
<tr>
<th>Week</th>
<th>Topic(s)</th>
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| 1    | **Course Overview**  
      “Digital Marketing Analytics” is a broad subject area, and this course is only 10 weeks long. In this first class, I will discuss what the course will (and won’t) cover, what will be expected of you during the course.  
      **Introduction to the Digital Marketing Landscape**  
      What are the key platforms and content types in the digital marketing landscape, and how they are integrated into marketing strategy? This session will provide an overview and will introduce several frameworks that aid in simplifying, classifying and communicating the topic space.  
      **Developing the Analytical Mindset**  
      The abundance of data in the digital world requires honed analytical thinking skills to effectively manage and exploit. In this class, we will review principles of descriptive, predictive, and causal analytics, with an emphasis on best practices to adopt (and common pitfalls to avoid!) when applying in digital. |
| 2    | **What is Artificial Intelligence?**  
      AI is a prevalent term right now, invoking awe and sometimes fear. We will discuss the history and high-level approaches of AI, as well as its current (and potential future) applications in marketing.  
      **Search Engine Optimization (SEO)** |
1. **Your reading will prepare you with a basic understanding of how search engines work, why SEO is important for marketing, and general principles of SEO. In class, we’ll discuss additional aspects of SEO, and develop the skills marketers need to: 1) conduct research and make recommendations for aspects of SEO most relevant to marketers; 2) collaborate with SEO specialists; 3) make strategic decisions involving search.**

2. **3 Paid Advertising**  
   Your reading will prepare you with an understanding of how search and display auctions work, strategies for researching keywords and targeting options, and what performance metrics are available for analysis. In class we will: 1) discuss additional considerations for keyword/targeting options and 2) practice analyzing real search ad performance data towards two goals: evaluation and diagnostics.

3. **4 Ad Effectiveness Testing**  
   When reviewing the homework, we’ll emphasize the limitations to common secondary data based approaches to ad evaluation. Is there a more rigorous way to measure the effectiveness of online ads? Your reading provides an example of a controlled experiment to measure search ad effectiveness. In class, we will discuss the problem more broadly, addressing questions such as generalizability and extension to other types of ads.

   **A/B Testing**  
   Extending the discussion of randomized experiments, your reading provides discussion and examples of A/B tests used to measure the impact of digital marketing changes. While the statistics of hypothesis testing was covered in Business Analytics, in this class we will discuss aspects of experimental design particularly relevant to digital, such as the selection of appropriate questions, success metrics, and invariant metrics.

4. **5 Website Analytics**  
   What do web analytics tools such as Google Analytics track? How reliable are they, and how can they be used to improve marketing strategy?

   **Digital Attribution**  
   How do you assign “credit” for a conversion when customers touch multiple marketing materials prior to converting? We will discuss common approaches used in industry, as well as their limitations.

5. **6 Social Media Marketing**  
   Practice using real Facebook post data to make recommendations for improving social marketing strategy.

   **Collecting Social Media Data**  
   How can you do analyses similar to the homework exercises on your own? We will learn how to use Twitter and Facebook tools and APIs to access brand page data for both accounts you do and don’t have ownership/analyst-level permissions.
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<tr>
<th>Influenor Marketing</th>
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<td>How does information tend to spread on social networks? What makes a user “influential”? We will discuss approaches and case examples for developing brand ambassadors</td>
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<tr>
<th>Social Listening</th>
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<td>How can user-generated content be used for marketing research? In class, a range of approaches and case examples will be discussed.</td>
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<tr>
<th>Mining User-Generated Text 1</th>
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<td>Working with unstructured text data requires some additional techniques. In this class, we will learn a general syntax called “regular expressions” to match, replace, and extract patterns in text strings; and, use this to perform a hashtag analysis on Twitter data.</td>
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<tr>
<th>Mining User-Generated Text 2</th>
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<td>In this session, we will continue to work with text data, extend lessons from the prior week to build keyword-based topic classifiers to enable you to quantify the frequency of online mentions of different topics or attributes. Sentiment analysis (and its associated benefits and challenges) will also be discussed, and R code provided for one implementation.</td>
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<th>Estimating Social ROI</th>
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<td>Quantifying the value of social media is even more challenging than evaluating advertising effectiveness. In class, we will discuss a range of approaches used in industry, and dissect the strengths and limitations of each.</td>
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<th>Course Wrap-up and Review</th>
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<td>What have we learned? How can you apply this moving forward as the digital landscape changes? This class will provide a review for the final exam, and helpful tips to use as you move forward in your careers.</td>
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<th>Group Project Presentations</th>
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**Feedback**
Feedback about your course experience is important to me. If at any point during the quarter you would like to tell me something anonymously, I have set up an online [Suggestion Box](#).

**Honor Code**
Students are expected to respect the Kellogg Honor Code and the Code of Student Etiquette. For complete reference, see the Kellogg Honor Code. If you are unclear about any aspect of the Honor Code or how it pertains to this class, please do not hesitate to speak to me. The following points, though not exhaustive, are particularly relevant for this class.

- **Group Project:** Discussions for group projects should be limited to your group. All members of a group are expected to make a substantial contribution. All members of the group should have full understanding of all material submitted by the group.
- **All assignments:** You may not use materials containing substantially similar analyses obtained from other sources. This includes, but is not limited to, material from current and former students and analyses found on the Internet.
- **Take-home exam and quizzes:** Take-home exams are open book, open notes, and open Internet (read only). However, you must work independently and may not communicate with anyone about the exam contents (digitally, in person, or otherwise).
Class Schedule: Fridays

Section 80 – 1:30 - 4:30PM

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<thead>
<tr>
<th>Class</th>
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<tbody>
<tr>
<td>Class 1</td>
<td>Friday April 6, 2018</td>
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<td>Class 2</td>
<td>Friday April 13, 2018</td>
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<td>Class 3</td>
<td>Friday April 20, 2018</td>
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<td>Friday May 18, 2018</td>
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<td>Class 8</td>
<td>Friday May 25, 2018</td>
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<td>Class 9</td>
<td>Friday June 1, 2018</td>
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<td>Class 10</td>
<td>Friday June 8, 2018</td>
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