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Fall 9-2015

### BMKT 491.03: Special Topics - Advanced Marketing Analytics

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#### Recommended Citation

Chandler, John W., "BMKT 491.03: Special Topics - Advanced Marketing Analytics" (2015). *University of Montana Course Syllabi*. 3821.

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# Advanced Marketing Analytics

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*Fall 2015, 3 credits*

*T-Th, 12:40-2:00*

*CRN 75165*

## Course Description

This course applies the skills and technology of data science to marketing applications. The focus is on real-world experiences and we will create an environment that will help you practice everyday skills if you begin working in data science. This course will provide an opportunity to practice the technical material introduced elsewhere in the data science certificate and in the business school more generally.

Note: this syllabus is subject to modification as the course progresses. Please check Moodle for the most up-to-date version if you have questions or feel like we've departed from the script laid out in the version you have.

## Course Objectives

1. Students will learn to embed statistical insights in a marketing context.
2. Students will receive additional practice and instruction with data science technology including Python, R, SQL and MapReduce.
3. Students will practice working with cross-functional teams across courses.
4. Students will refine their ability to communicate technical results to a non-technical audience.

## Required Materials

None that you have to buy. Relevant chapters and technical resources will be distributed during the course.

## Assessment

Students will be evaluated on regular analysis assignments, work supporting other students' analysis, and a final project. Throughout the course students will be introduced to data sets and given self-contained assignments on a regular basis. These assignments will require some basic programming in one of the languages reviewed in the course (Python, R, SQL, or a MapReduce language). Students will use this expertise to support students from Telling Stories with Data to acquire the data they need to complete their assignments. This process will practice the collaborative skills that are central to data science in the workplace.

### Class Participation: 25%

Students are expected to attend class and participate in class discussions. Missing more than 15% of classes without an excuse will result in losing half the class participation credit.

### Weekly Email Assignment: 5%

Emails must be sent to [bmkt491.3@gmail.com](mailto:bmkt491.3@gmail.com) by 9 AM Mountain Time every Thursday. (Students in both classes—bcc both email addresses and double dip!) This email can be short and include a link, an article or topic related to data or data science. Ideally this email will be sent to a friend, family member, colleague or acquaintance with the class-specific email blind carbon copied. This assignment builds a useful networking muscle. Emails sent on-time with zero or one typographical error will receive a 10/10. Each typographical error beyond the first will drop the points by 3. Late emails will have their points docked by 5.

### Analysis Assignments: 50%

Students will be assigned 3-5 moderate-length assignments during the semester. These will require data preparation, analysis, and result presentation in several formats (email, written report, presented slides).

### Support Assignment: 20%

Students will be paired with students in Telling Stories with Data and will have several opportunities to help their colleagues refine their business question and assemble the relevant data set. This grade will be based on outside assessment of students' performance.

## Class Format

Class format will be split between practical, hands-on work and lectures or guest lectures. The lectures will introduce new technical material, analyze real-world implementations of data science techniques, and serve as refreshers for the advanced marketing and technical material. We will attempt to schedule guest lecturers with data science practitioners to ground students in the reality of practicing data science at leading companies.

The class will also work with large, real world marketing data sets. For each data set we will brainstorm storage and access solutions and implement a mutually-agreed-upon approach. From this foundation we will query the data set using available tools and brainstorm potential analyses that leverage our strengths in statistics, machine learning, computer science, and marketing.

In particular, students in this class will collaborate with “Telling Stories with Data” to provide those students with the data for the ‘storytelling’ phase. This valuable collaboration mimics the way data scientists function in the workplace—to support business groups. The ability to work with another course to generate requirements, understand requests, and deliver results is very rare in an academic environment but ubiquitous in industry. Students in both classes will *really* get to see how the sausage gets made!

## Course Outline

The following is a rough outline of the topics to be covered, by week.

- Week 1: Technology set-up. Overview of main tools. Introduction to Wedge and Noon's data set.
- Week 2: Python "refresher". Association analysis. Introduction to cross-class collaboration partners. Univariate analysis on Wedge "Seward Defense".
- Week 3: Customer Segmentation and Wedge data. Introduction to SQL.
- Week 4: Simulation and the bootstrap. SQL practice.
- Week 5: ALPS data introduction. SQL implementation. Multivariate modeling.
- Week 6: Classification with ALPS data.
- Week 7: Hadoop, MapReduce, and large scale data. Introduction to Marketing Evolution data.
- Week 8: Attribution modeling.
- Week 9: Product affinities with Wedge data.
- Week 10: Profiling consumer behavior.

TBD below here, but we'll cover additional topics in statistics and technology.

We will work with four principal data sets over the course of the semester:

1. ALPS: ALPS is a Missoula company with a national footprint. They insure attorneys in 40 states. We will work with them to understand challenges in the insurance space and how data can be leveraged to better understand their customer base.
2. Wedge Co-op: The Wedge is the largest co-operative grocery store in the country and we are fortunate to have an enduring partnership with them. They have extremely rich data on consumer purchasing tied to co-op owner numbers. As such, we will work with several different views of their data.
  - a. Understanding how customers respond to changing prices at the Juice Bar and supply-chain challenges in the deli. This data will be paired with a Wedge effort to do marketing outreach to these customers and, if we're lucky, we'll be able to measure the impact of those efforts.
  - b. Customer segmentation and business forecasting. We will use the Wedge data over time to forecast how the business is doing. This analysis will be paired with the book *Online Marketing Simulations*.
  - c. Reduction of SKUs. The Wedge is going to be doing a remodel, which will necessitate reducing products by 10-20%. Which products should they drop during the remodel?
3. Noon's: Noon's runs a gas distribution business as well as three convenience stores around Missoula. We will analyze the transaction data from their stores to understand product affinities and make promotional and stocking recommendations.
4. Marketing Evolution: Marketing Evolution is a leading marketing modeling company. We will look at the type of data they work with and answer some key business questions for them.

## The “fine print”

*Professional Business Conduct in Class:* You are preparing to enter the business world as professionals and to prepare for a business career, so I expect each of you to behave in a professional manner in class.

- Arrive on time and stay for the entire class (unless excused by me).
- Behave with honesty and integrity. Don't let your team down!
- Respect everyone in class and listen openly to their ideas.
- Come to class prepared for discussion.
- Refrain from engaging in behavior that disrupts the class- this means no cell phones!

If at any time you are displaying disrespectful behavior, you may be asked to leave.

*Academic Integrity:* Academic misconduct is any activity that may compromise the academic integrity of the University of Montana. Academic misconduct includes, but is not limited to, deceptive acts such as cheating and plagiarism. Please note that it is a form of academic misconduct to submit work that was previously used in another course.

“Plagiarism is the representing of another's work as one's own. It is a particularly intolerable offense in the academic community and is strictly forbidden. Students who plagiarize may fail the course and be remanded to the Academic Court for possible suspension or expulsion.”

“Students must always be very careful to acknowledge any kind of borrowing that is included in their work. This means not only borrowed words *but also ideas*. Acknowledgement of whatever is not one's own original work is the proper and honest use of sources. Failure to acknowledge whatever is not one's own work is plagiarism.” So, ALWAYS err on the side of caution by citing the resources used in preparing your work. Moreover, always use direct quotations for exact wording taken from another source.

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at [http://life.umt.edu/vpsa/student\\_conduct.php](http://life.umt.edu/vpsa/student_conduct.php). It is the student's responsibility to be familiar the Student Conduct Code.

*Disability Accommodations:* Students with disabilities will receive reasonable accommodations in this course. To request course modifications, please contact me within the first two weeks of class. I will work with you and Disability Services in the accommodation process. For more information, visit the Disability Services website at <http://www.umt.edu/dss/> or call 406.243.2243 (Voice/Text).

## *SCHOOL OF BUSINESS ADMINISTRATION MISSION STATEMENT*

The University of Montana's School of Business Administration is a collegial learning community dedicated to the teaching, exploration, and application of the knowledge and skills necessary to succeed in a competitive marketplace.

*Email:* According to University policy, faculty may only communicate with students regarding academic issues via official UM email accounts. Accordingly, students must use their GrizMail accounts ([netid@grizmail.umt.edu](mailto:netid@grizmail.umt.edu) or [fname.lname@umontana.edu](mailto:fname.lname@umontana.edu)). To avoid violating the Family Educational Rights and Privacy Act, confidential information (including grades and course performance) will not be discussed via phone or email.

## *SCHOOL OF BUSINESS ADMINISTRATION - ASSESSMENT AND ASSURANCE OF LEARNING*

As part of our assessment process and assurance-of-learning standards, the School of Business Administration has adopted seven learning goals for our undergraduate students:

- Learning Goal 1 – SoBA graduates will possess fundamental business knowledge.
- Learning Goal 2 – SoBA graduates will be able to integrate business knowledge.
- Learning Goal 3 – SoBA graduates will be effective communicators.
- Learning Goal 4 – SoBA graduates will possess problem solving skills.
- Learning Goal 5 – SoBA graduates will have an ethical awareness.
- Learning Goal 6 – SoBA graduates will be proficient users of technology.
- Learning Goal 7 – SoBA graduates will understand the global business environment in which they operate.

*Upon successful completion of this course, a student will be able to:*

- Understand the overall lifecycle of a data science project and apply this knowledge to creation and communication of a project plan.
- Formulate a data science question from a business question. This process includes identifying metrics and data sets used to answer the question.
- Understand the challenges in assembling data sets at a variety of scales and will be able to form a well-reasoned opinion on how to approach the problem.
- Prepare a data set for analysis. This Extract-Transform-Load (ETL) process can be time-consuming, but is one of the most critical features of working with data.
- Compare data science approaches taken by leading technology companies today and have a rough understanding of their technological infrastructure.
- Bring key technologies within data science to bear on real-world problems.

