MIS 6860 - Business Intelligence and Analytics Syllabus
Spring 2018
T 4:30-7pm, EBB 211

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Office Hours: TBA

Catalog Description:
Provides a conceptual and practical overview of analytical tools, techniques, and practices used to support data-driven decision making in an organization.

Introduction:
Data has become an important strategic asset to gain and maintain competitive advantage for many organizations. This course provides the foundational knowledge, skills and tools to support data-driven decision making. Organizations (whether they are businesses, non-profits, or governmental) generate, collect, and store vast amounts of data. Decision makers increasingly rely on the systematic analysis and interpretation of data to improve the quality of their decisions. We will examine aspects of data and analytics to gain understanding of the principles and applications of the ideas that can lead improved decision making. We will examine real-world examples and develop data-oriented thinking and skills that are of interest to business professionals.

Course Learning Objectives:
By the end of this course you will have gained an understanding of how business professionals can use analytics techniques to formulate and solve relevant problems and how they use analytics to support decision making. You will learn the principles of developing, reporting, and analyzing business data. In support of these activities selected analysis tools and methods will be utilized. After taking this course, you should:

- Understand the essentials of data analytics and the corresponding terminologies. Define what is meant by data analytics, data mining, and business intelligence, big data, and describe how and why developments in computing, data availability, and data science methodologies are enabling organizations to adopt a data-driven approach to decisions and operations.

- Be familiar with the steps involved in the analytics process. Explain the process of data analytics, including the six steps of the Cross-Industry Standardized Process for Data Mining. Recognize the best practices and pitfalls of managing data analytics projects. Think strategically and systematically about whether and how data can improve business performance and inform decisions for management, marketing, and other business application areas.

- Be able to interact competently on the topic of data analytics. Know the fundamental principles of data science and business analytics that form the basis for data mining processes, algorithms, and systems. Understand these to the level to be able to work on analytics projects and interact with experts and clients.

- Have had some hands-on experience in using data analytics techniques. Understand the basics of databases, data warehouses, and the use of basic Structured Query Language (SQL) commands to extract data. Gain practice utilizing software tools for both business intelligence (extracting, cleansing, integrating, visualizing, and reporting data) and data mining (building descriptive and predictive models).

The objectives are addressing the following IDEA Center Learning Objective items which will constitute your primary basis of how you will evaluate the course at the end of the term:
- **Objective 1 (Essential):** Gaining factual knowledge (terminology, classifications, methods, trends)
- **Objective 2 (Essential):** Learning fundamental principles, generalizations, or theories
- **Objective 3 (Important):** Learning to apply course material (to improve thinking, problem solving, and decisions)
- **Objective 4 (Important):** Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course
- **Objective 11 (Essential):** Learning to analyze and critically evaluate ideas, arguments and points of view.
- **Objective 12 (Important):** Acquiring an interest in learning more by asking my own questions and seeking answers.

**Required Books:**

- Additional readings will be distributed during the course

**Optional Books:**


**Software:**

We will be using the following software applications: Microsoft Excel, Microsoft PowerBI Desktop, and RapidMiner. Each of these applications can be installed or accessed free of charge. Instructions for accessing this software can be found on the course Canvas site, in the Software page.

**Grading:**

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<th>Component</th>
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<tr>
<td>Critical Thoughts</td>
<td>10%</td>
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<tr>
<td>In-class Activities</td>
<td>10%</td>
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<td>Assignments</td>
<td>50%</td>
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<td>Exam</td>
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<td><strong>Total</strong></td>
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**Grading Scale:**

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Critical Thoughts:

The purpose of the critical thought discussion assignments is to invite you to think critically about the concepts you read and make comments/discuss with each other how they apply or fail to apply to your own experience. Every week of the course will feature a discussion thread, and you are be asked to submit (as an individual) one post per week. At least one of these must be an original post, and at least one must be a substantive reply to someone else's post (you can choose which type you post for the remaining ones). Possibilities include the following:

Original Posts

1. Provide an example of how a company (your own or another organization) uses or could use concepts, tools, or technologies discussed in the readings.
2. Offer an alternative or supporting opinion, supported by reason and/or evidence, on something that you found interesting in the readings.
3. Find an online resource that supports, clarifies, or refutes a concept or idea presented in the readings. (Provide a link to the resource and a brief commentary on why you think it is interesting or important.)
4. Pose an open-ended question (NOT a yes/no question) about something you read and started to think about, or maybe didn't understand, in the reading. Be sure to include supporting explanations and background to give context to your question.

Substantive Reply

A substantive reply includes more than just a superficial comment like, "that's great, right on mate..." Rather, your reply should do one or more of the following:

1. Provide a thoughtful interpretation or extension of the post, including your own interpretation
2. Where appropriate, provide a well-reasoned and respectful counterpoint to the topic or argument posted
3. Provide supplemental resources (including your commentary) that support or refute the original post
4. Provide a meaningful answer to a question posed by another student

Guidelines

When making your posts, keep the following guidelines in mind:

1. You do not need to address all of the above points in every post; just pick one or two
2. You do not need to incorporate all of the readings into your post, although integration across readings is certainly encouraged. Choose one or two points from the reading that you found most interesting.
3. Your post should be of adequate length to express your point, but not too long. Typically, a single paragraph (or 4-7 sentences) will suffice.

In-class Activities:

There will be some in-class activities assigned in which I will ask you to perform some tasks and submit the results. (The lowest score from this category will be dropped and not counted towards the calculation of the final grade.) To further encourage the reading of the assigned chapters and papers, short quizzes might be administered at the beginning of the classes when a reading is due. Questions on the quizzes will address the major concepts from the readings and they will not probe into intricate details of the topics.

Assignments:

There will be several assignments given during the course. Individuals or groups will be responsible to perform the required tasks of the assignments. The assignments will contain the necessary detailed requirements.
Exam:

An exam will be given to assess your knowledge of the terminology, concepts and methods of business analytics and business intelligence along with your ability to use and apply this knowledge to a variety of situations. The exam will contain questions from the assigned books and readings, and discussions from the course. Because the exam is orientated toward conceptual understanding of the material, it will consist primarily of questions that are in multiple choice and/or short answer format. It is crucial that you read the assigned material to perform well on the exam, as some material may not be covered in details during class discussions.

Class Policies

Class Communication:
Many important documents (assignments, surveys, additional readings, preparation materials, etc.) will be distributed via Canvas. You should regularly check the Canvas class site for essential information regarding the class. It is your responsibility to find the required material in a timely manner.

Course Approach:
Textbook readings, supplemental readings/cases, class presentations, and class discussion will help to convey the main body of knowledge and to stimulate desired critical thinking. The instructor will serve as a facilitator and evaluator in a collaborative learning experience. Effective learning will result from your involvement in applying critical thinking during class discussions and presentations. Completing your homework assignments in time are essential in order to move through the material. The course will include hands-on, practical exercises to utilize selected analysis tools and methods.

Late Work
Due dates will be observed; no late work will be accepted except in exceptional life events when a late penalty of 10% deduction per day will be applied.

Attendance Policy
The USU General Bulletin states that “A student is expected to attend all meetings of a class for which she or he is registered. A student may be dropped from a course by the Dean if absences are repeated and the Instructor recommends this action. A student can gain readmission only with permission of both the Dean and the Instructor. A student dropped from the course receives an ‘F’ which counts as work attempted whenever grade point ratio calculations are made. Students with absences in excess of 10% of scheduled class meetings may be administratively withdrawn from the class with a grade of F which will count as work attempted whenever grade point ratio calculations are made.”

Cell phones and Computers
Please turn cell phones off during class. If you need to keep yours on for emergency purposes, please notify the instructor in advance and then step outside the classroom to take the call. It is a violation of the USU Student Code to use computers in class in any way that “interferes with or disrupts the work of students, faculty, or university officials” (Section V-3 B.25.c). Acceptable uses of computers in class include taking or reviewing notes, in-class assignments, or scanning course articles you don’t wish to print. Please use computers only for course-related activities.

Plagiarism
Plagiarism includes knowingly "representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes the unacknowledged used of materials prepared by another person or agency engaged in the selling of term papers or other academic materials." The penalties for plagiarism are severe. They include warning
or reprimand, grade adjustment, probation, suspension, expulsion, withholding of transcripts, denial or revocation of degrees, and referral to psychological counseling.

On my honor...
The Utah State University honor code reads:
“I pledge, on my honor, to conduct myself with the foremost level of academic integrity.”
I expect that you will keep “the code”. Failing to do so will result in a failing grade.

Students with Disabilities
The Americans with Disabilities Act states: "Reasonable accommodation will be provided for all persons with disabilities in order to ensure equal participation within the program. If a student has a disability that will likely require some accommodation by the instructor, the student must contact the instructor and document the disability through the Disability Resource Center (797-2444), preferably during the first week of the course. Any request for special consideration relating to attendance, pedagogy, taking of examinations, etc., must be discussed with and approved by the instructor. In cooperation with the Disability Resource Center, course materials can be provided in alternative format, large print, audio, diskette, or Braille."

Grievance Process (Student Code)
Students who feel they have been unfairly treated may file a grievance through the channels and procedures described in the Student Code: Article VII Grievances, pages 25-30.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topics/Activities</th>
<th>Due</th>
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| 1/9   | Introduction & Course Overview  
Data Driven Decision Making  
What-If Analysis: Data Tables, Scenario Mgr., Goal Seek.                                                                                               |                     |
| 1/16  | HtMA Chs 1, 2, 3: Intangibles; Intuitive measurement habits; Illusion of intangibles.  
Pivot Tables                                                                                                                                           | CT                  |
| 1/23  | HtMA Chs 4, 5: Clarifying; Calibrated estimates. (Until: The effects...; p106)  
RapidMiner – Introduction                                                                                                                                  | CT Assignment - (W-I, Pivot) |
| 1/30  | HtMA Chs 5 (remaining pages), 6: Calibration discussion; Measuring Risk.  
Monte Carlo                                                                                                                                                    | CT Assignment - (Calibration) |
| 2/6   | HtMA Chs 7(skim only), 8: Value of information; Transition: what – how.  
Decision Analytics – Decision Trees                                                                                                                          | CT Assignment - (MC) |
| 2/13  | HtMA Ch9: Sampling.  
Linear Regression (Excel, RapidMiner)                                                                                                                       | CT Assignment – (Decision Trees) |
| 2/20  | *No class; Monday schedule*                                                                                                                                                                                        |                     |
| 2/27  | Data Analytics; RapidMiner: Decision Trees  
Evaluations                                                                                                                                                   | Assignment - (LinReg) |
| 3/6   | *Spring Break*                                                                                                                                                                                                      |                     |
| 3/13  | *No class; MBA trip*                                                                                                                                                                                                |                     |
| 3/20  | Logistic Regression  
Neural Networks                                                                                                                                                                                      | Assignment - (Classification) |
| 3/27  | Comparing Methods  
Clustering                                                                                                                                                                                               |                     |
| 4/3   | *Team work - TBA*                                                                                                                                                                                                   |                     |
| 4/10  | AaW Chs 1, 2, 3: What it means, Data, Enterprise; Association Analysis                                                                                                                       | CT                  |
| 4/17  | AaW Chs 4, 5, 6: Leadership, Targets, Analysts.                                                                                                                                                                       | CT Assignment - (RapidMiner) |
| 4/24  | Case discussion,  
Loose Ends, Wrap-up                                                                                                                                                                         | Assignment - (Case) |
| 5/3   | TBA (Official Calendar Final Exam Time: 3:30 – 5:20)                                                                                                                                                    | Exam                |