

Big Data and Innovation **BMKT 680 (3 credits)**

Prerequisites for this course include curiosity about the reason things are the way they are; a desire to think in new ways; an aptitude for linking data to decisions, for bringing a quantitative mindset to problem solving.

Required Readings: Available on Moodle.

Preferred Communication: Slack is the quickest, most effective way to reach me (I am drowning in email and often find a day or two goes by before I can reply). If you need a response to an issue faster than I get to it on email, please Slack me!

Also: Please be sure to opt-in to our class channel, #analytics-innovation.

Course Format: I will typically start each class with a lecture-type format, followed by in-class work/exercises and discussion. Because of this, my expectation is that students will participate during the assigned class time (via Zoom or in person). On the rare occasions when you can't be there, please let me know ahead of time via Slack (professional courtesy); you will have until the following Monday to watch the Zoom material and submit the assignment/exercise from that material (via Slack).

Classroom Environment/Goals: In order to provide an enjoyable, provocative learning experience, this course will provide a mix of lecture, discussion, and an occasional guest speakers. Regular attendance, active learning, and participation are expected. Contributing to a quality learning environment is the job of each individual student, and *you can do so only if you are well-prepared for each class* (by having read and done the assignments in advance). My hope is to foster a challenging yet supportive environment where you can flourish and learn.

Course Content: At its core, this course focuses on a strategic perspective: the power of big data to unleash new insights and innovations. This class offers students the opportunity to reflect on how data science can be leveraged for innovation and for solving “big problems”.

In addition, the course affords an important managerial perspective on the challenges organizations face in harnessing the power of data analytics—leveraging the technical capabilities of data science/data scientists—and how to overcome those challenges. The goal is to train students, future managers, to think strategically and innovatively about data, about opportunity, about value. It will ensure that graduates are proficient in strategy, customer value, and insights so they are prepared to be promoted to leadership positions in their organizations.

More specifically, this course addresses two of the five learning objectives for the MSBA program. As such, students will be expected to demonstrate proficiency for both of them:

- 1. Innovation ➔** Ability to innovate beyond answers existing questions and solutions known problems—harnessing data analytics to identify new sources of value; to see patterns and anomalies; and to reveal new insights.
- 2. Ethics/Data Stewardship ➔** ... to secure data, develop policies for ethical use of data, respect of data privacy.

Sprinkled through-out the course will be readings, guest lectures, right-brain sensory activities, and extemporaneous assignments.

<u>Specific learning objectives include:</u>	<u>Learning Outcomes:</u>
Understanding the challenges organizations face in harnessing the power of big data and solutions to overcome those challenges	Articulate sophisticated insights of these challenges as well as solutions
Being informed about the progression/trajetory of data science in business	Articulate knowledge about how the field of data science has progressed and evolved over time. ⇒ The past informs the future
Understanding the various types of innovation and disruption	Convey a nuanced understanding of different types of innovations and their pros/cons
Using design thinking to develop user empathy and generate creative insights	Integrate knowledge of data science with design thinking to develop innovations
Exploring tensions in data privacy from multiple perspectives	Convey a nuanced understanding of privacy concerns from the business, customers, societal, and policy perspectives
Understand the unintended consequences of data science from multiple perspectives	Proactively plan for mitigating unintended consequences
Understand how data science can be leveraged for “social & environmental good”	Understand how data analytics can be applied to address social and environmental problems

Course Requirements

Requirements	Weight
1. Two Provocative, Insightful Blog Posts based on class readings/learnings	30% (15% each for initial submission) 10% (5% each for fine-tuning based on feedback)
2. In-class contributions	20% (10% first half/ 10% second half)
3. Presentation on one of your blog posts Quality of powerpoint presentation	5 % 5%
4. Data privacy position paper (Presentations* decided by classmates)	20%
5. Your thoughtful, substantive, constructive evaluation of three of your peers' work	10%
	100%

* 5% bonus if selected to present in class.

Minimum Expectations: All work in this course must exhibit writing competency for business executives, competency in the concepts from this course, and technical competence as appropriate.

All your written work in this class will be submitted anonymously/by number.

Course Requirements:

1. **Two Provocative, Insightful Blog Posts** based on class readings/learnings.
30% (15% each) for initial submission; another 10% (5% each) for fine turning incorporating feedback. Based on topics of interest, students will write and submit two blog posts of roughly 1500-2000 words –about 5-6 pages (spacing for me of 1.5, not single spaced).

Grading criteria:

- Explicit knowledge of key points/issues from the readings/lectures (may use a table or figures to demonstrate key knowledge) – don't be superficial; show insights via detail and appropriate referencing
- Insights/implications of readings for your own data science journey (key quotes, meaning, etc.)
- Professional writing skills (clear, concise, accurate) and quality formatting.

Each student will provide peer feedback on three of his/her classmates' blogs due one week after due dates.* (see #5 below)

2. **In-class contributions** 20%. (10% first half; 10% second half). This component will be my assessment of your engagement and contribution to the content and spirit of the class via VERBAL CONTRIBUTIONS exhibiting:

<ul style="list-style-type: none">• Knowledge of readings• Examples shared	<ul style="list-style-type: none">• Quality of insights• Questions asked
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This is a QUALITY assessment and not quantity. It includes being respectful of your classmates' different styles of communication and needs for time to formulate/share their thoughts.

See Self-Evaluation on last page of syllabus—turn in self-evaluation on March 3rd.

3. Presentation on Blog Post. Grading criteria:

- Quality visuals (5%) of grade
- Quality delivery (clear explanation; excellent delivery; effective time management, etc.) 5%

4. Data Privacy Position Paper 20%: Details on separate page.

5. Quality, rigor, tone, and timeliness of peer grading (10%). As business professionals and managers, you must be skilled at both giving and receiving feedback. Peer grading is common in executive programs and in MOOCs. I will provide specific evaluation sheets for all your peer grading.

Final Grades: Plus/Minus grading will be used for final grades on the following scale.

93 - 100% A 90 - 92% A-	A = Demonstrates thorough, sophisticated understanding of the subject, displays mastery of material; analysis and writing demonstrate compelling logic, critical insights, and careful attention to detail; communicates with professional/excellent oral and written communication skills.
87 - 89% B+ 83 - 86% B 80-82% B-	B = Good understanding of the material (possible occasional oversight of key facts/ issues) and/or minor issues with clear/concise written/ oral communication; lacks supporting detail/sophisticated insights.
77-79% C+ 73-76% C 70-72% C-	C = Basic/rudimentary comprehension of terms (some inaccuracies); unclear communication skills that need significant attention/improvement.
67-69% D+ 63-66% D 60-62% D-	D = Lack of knowledge/proficiency with class concepts and/or inability to communicate your degree of learning about class material.
Below 60%	F = Dereliction of class responsibilities.

General: You are encouraged to discuss your work and progress with me at any time in order to cover specific problem areas, to further clarify material, or to provide you with concrete suggestions on how to improve your performance. I'm also happy to discuss course planning and career advising at your request.

A Reminder About Exit Exam: Our Accrediting Body requires that we administer an exit exam to our graduate students. This will be in the Capstone class, AND it will cover all the required classes in the program. As far as this class goes, I will ensure you are prepped and ready for the questions on Data Analytics & Innovation.

Classroom Etiquette & Professionalism – Although I tend towards the informal side, respectful behavior is required in order to provide the best learning environment—this includes not only respect for diversity, but also not hogging the airtime, and being respectful of students who need a bit more time to formalize and articulate their thoughts.

Please: no sidebar discussions during lecture or class discussion, no newspapers or crossword puzzles, no cell phone use during class (e.g., under-the-table text messaging), no surfing the web, and no other disruptive actions (i.e. leaving abruptly during class without prior notification). If you are disruptive in class (talking, text messaging, etc.), you will be asked to leave class and any points awarded that day will be forfeited (attendance, participation, extra credit).

Preliminary Course Outline: Will be updated regularly.

Date	Topic	Assignment/Deliverables
Week 1 - January 14	Course Introductions/Expectations Lecture: Welcome to Big Data & Innovation	Read two pager: Magic in the Mashup of Data & Creativity (2019), Jakki Mohr, <i>Marketing News</i>
Week 2 Jan. 21	Lecture: Challenges in Harnessing the Power of Data Analytics	HBR Classic: Big Data: The Management Revolution, by Andrew McAfee and Erik Brynjolfsson (2012), HBR. Most recent: "When Data Creates Competitive Advantage" (2020), HBR.
Week 3 Jan. 28	Lecture: Customer-Driven Innovation	Reading: "The Hard Truth About Innovation Culture," HBR (2019) Gary Pisano
Week 4 Feb. 4	Building An Analytics Strategy	Reading: "Data Science and the Art of Persuasion," HBR (2019) Scott Berinato
Week 5 Feb. 11	Applications...	Gap Case Analysis (?)
Week 6 Feb. 18	Building Analytics Capabilities	Reading on Google: Science of Radical Creativity https://www.theatlantic.com/magazine/archive/2017/11/x-google-moonshot-factory/540648/
Week 7 Feb. 25	Role of Company Culture & Big Data: 3 presenters: Hong Shen Lee; Kathryn P; Aspen R.	Blog Post #1 Due
Week 8 March 3	Unintended Consequences of data analytics 3 presenters: Jordan McNea; Apsara R; Michael S.	Reading: Unintended Consequences : How Airlines Get so much wrong with So Much Data; Reading: How Needs Judgement When You've Got Data? (Knowledge@Wharton March 2018) "Confronting the Risks of AI": McKinsey (April 2019) Self evaluation of participation due
March 9, Monday		Speaker Due Diligence Due and/or Speaker Reflection (Friday after)
Week 9: March 10	Outside Guest Speaker 3 presenters: Niike G; Taylor T; Sarah T.	

Week 10 March 17	Spring Break	
Week 11 March 24	Analytics for Societal Good	TBD
Week 12 March 31	Data as Fuel for the Economy. Should individuals be compensated and how?	Data as Currency; Economist
Week 13 April 7	AI Readings/discussion: 3 speakers: Austin B; Alistar B; Kelly B.	Blog Post #2 Due “Winning with AI,” October 2019/Sloan Management Review.
Week 14 April 14	AI Readings/discussion: 3 speakers: Alexis C. Brenna H.	“Building the AI-Powered Organization” (July/August 2019) HBR “Derisking machine learning and AI” (McKinsey Feb. 2019)
Monday, April 20		Speaker due diligence due and/or Speaker Reflection (Friday after)
Week 15 April 21	Outside Guest Speaker	Privacy Position Papers Due
Monday, Apr. 27, noon		Peer Feedback on privacy papers due to me
Week 16 April 28	Course Wrap Up! Course evaluations	
Monday, May 4	Final Exam: 1:10-3:10	Final Privacy Papers Due Privacy presentations and evaluations

General Discussion Questions for Readings:

1. What is the basic premise of this article? (Succinctly; 3-5 sentences).
2. What evidence do(es) the author(s) marshall in support pof that premise?
 - a. Quantitative evidence
 - b. Logic
3. What are the key take-aways for this particular topic? i.e., what should managers do differently after reading this article. Be specific & thorough!
4. Your reflection: What does this knowledge/information from this article mean for you? E.g., as a data scientist; in terms of your own philosophy of what being a “good” data scientist/leader; etc.
5. Key quotes/tidbits that you really liked.

A Note About Expectations/Readings/ “Owning” the Material: I have mixed feelings about not having an exam. I know exams are a key way to ensure that students absorb, retain, and “own” the material. At the same time, memorizing is not the most effective way to think about “owning” this content. I find that without exams (and despite students’ good intentions), the reality is a tendency to

sort of skim. To provide the proper incentive AND to do so without an exam, I'm going to use a random name generator to kick off discussions of the articles. Forewarned is forearmed!

Data Privacy Position Paper*

(May be done in pairs or solo)

Your mission is to write a 5-page (double-spaced, 1" margins, 12 point font) position paper / blog post exploring the data privacy controversy. I expect your analysis to be thoughtful, meaningful, and constructive.

1. Succinctly introduce the controversy and offer a statement of purpose for your paper
2. Research the controversy and its dimensions/perspectives. **You should have at least 2 citations for each dimension of the controversy.** Controversial issues involve nuance and multiple dimensions (versus a simple pro and con) and you'll need to both identify and clearly explain these dimensions.
3. Take a stance on the privacy debate and persuasively argue your position. This means providing credible support and reasoning for the position. This is NOT an opinion piece!
4. Visual support: Tables and figures. Please convey your points and perspectives both with a visual figure and a summary table. Any tables or other exhibits, as well as your references, do not count toward the page limit.
5. Works Cited (does not count in page limit).

Rough ball park, expectations: The assignment should take approximately 2-3 hours for research and another 2-3 hours to write.

Goals

1. To be conversant in the data privacy controversy from multiple angles/dimensions
2. To hone your critical thinking skills;
3. To **develop** your writing skills – a successful Position Paper must be thoroughly researched, concise and persuasive.

Due Date: Apr. 21 / Peer feedback due April 27th (Monday) at noon.

In-class debate: 3-5 students/teams selected/present May 4th (peer evaluations)

Grading Criteria

- How comprehensively you explain the various dimensions and perspectives of the controversy, including support through citations.
- The credibility and support for your position. Do you use compelling logic and evidence in the stance you take?
- Writing skills. Is your writing clear, organized and coherent?

* Ideas: Take a specific case of data privacy violations and analyze what happened; Do a book club on a data privacy book; etc.

Academic Misconduct -- Integrity and honesty are basic expectations for behavior. It is your duty to act honestly and ethically in your coursework, and it is my duty to ensure a fair classroom environment for all students.

Cheating of any sort will not be tolerated. Cheating, failure to follow instructions, and/or failure to follow course policies may result in a reduced grade or a failing grade.

The following message about academic integrity comes from the Provost's office: "*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.* It is the student's responsibility to be familiar the Student Conduct Code (found online at <http://www.umt.edu/student-affairs/community-standards/Student%20Conduct%20Code%20-%20FINAL%20-%208-24-18.pdf>).

Students are expected to:

- Be knowledgeable of activities that are considered academic misconduct, as defined in the UM Student Conduct Code,
- Practice academic honesty on all exams, quizzes, homework, in-class assignments, and all other activities that are part of the academic component of a course,
- Encourage other students to do the same.

If you are unsure if a behavior will be viewed as academic misconduct, please ask. *A good rule of thumb is that any credit-earning activity in a course should represent the true skills and ability of the individual person receiving the credit.* A partial list of situations that are considered academic misconduct is in the SoBA Professional Code of Conduct (found online at <http://www.business.umt.edu/ethics/default.php>).

If at any point a student is unsure if working with another student is permissible, that student should contact the instructor before doing so.

Please note that it is a form of academic misconduct to submit work that was also used in another course, aka “*double dipping.*” **Don’t do it.** If you are trying to get synergies across your classes/assignments, just ask a professor for advice. Don’t try for a two-fer without approval!

I also have a history of treating any plagiarism (from the Internet or any other source) quite severely. Always cite your sources appropriately. It actually makes your work more credible.

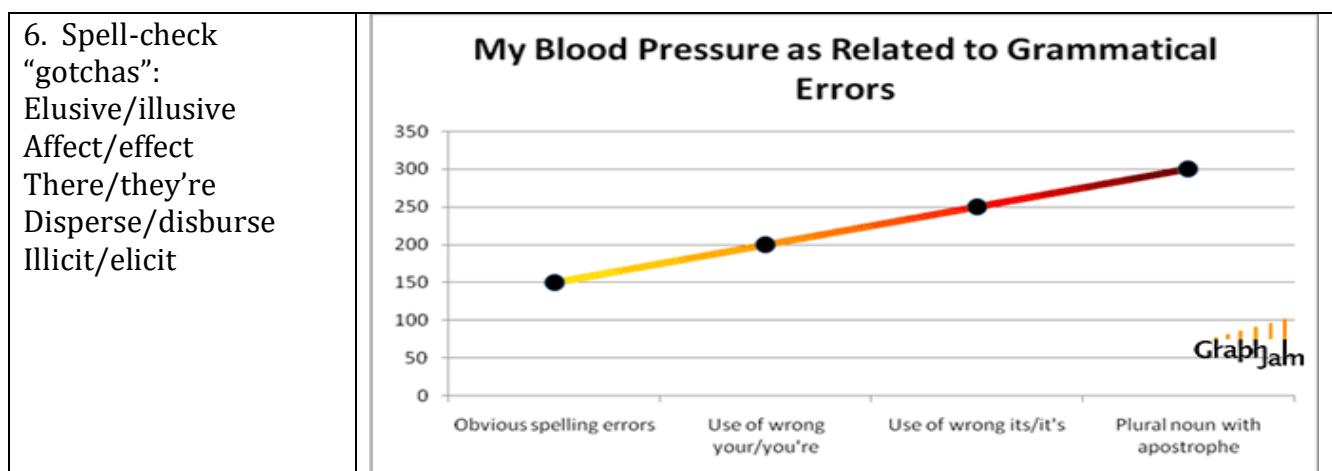
Disability Services for Students -- Students with disabilities will receive reasonable modifications in this course. The student's responsibilities are to request the modification from me with sufficient advance notice and to be prepared to provide official verification of disability and its impact from Disability Services for Students. To respect your privacy, please speak with me during my office hours about your needs.

Common Grammar Problems:

1. Avoid (Do Not Use) "You" (second person) in any professional paper.
Instead, use "the consumer," or "the company," or a noun for whatever referent "you" was referring to.
2. Use correct forms of possessives. Here are two examples:
 - its (as in "look at its hair"). (It's = it is)
 - a company's strategy (not a companies strategy)
3. Use correct punctuation. Here are some examples:
A semi-colon (;) is used to separate two complete sentences (each with its own noun, verb, and complete thought). "The product strategy makes sense; however, the pricing strategy seems a bit off."

A colon (:) is used when a list is to follow: There were a variety of marketing tools used by the company: product, price, promotion, and distribution.

Use commas to set off phrases (one at the start, and one at the end of the phrase): It was hard to tell, based on my understanding, just what she meant.
4. Eliminate sentence fragments. Each sentence should have its own noun and verb and should express a complete thought.
Bad: "Like my dad, for example." Or "When the company reorganized."
Good: "People, like my dad for example, would be offended by that strategy." Or "When the company reorganized, profits soared."
5. Cite appropriately the references and sources you use in writing your paper.



Self-Evaluation of Class Participation
(Due Tuesday, March 3)

Name:

Class Participation is a function of:

- Voicing your ideas: do you attempt to *articulate your ideas* about the assigned reading and class concepts (description of class concepts; elaboration on assigned readings)?
 - Sharing examples: do you bring up *current events* in the news, and/or *relevant examples* that are related to class concepts?
 - Asking questions: Do you ask questions to clarify material and/or probe on topics?
 - For “active” students: Do you give your classmates a chance to talk? Do you prioritize your contributions? How?
 - For “quiet/shy” types: Are the contributions you would like to make written down in advance of class? (Examples, questions, most interesting..., etc.)
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Please assign yourself a participation grade (0-100%)

My Score: _____

What are you doing that you think is very good with respect to your participation record?

What are you doing that you think is not as good as you wish it were with respect to your participation record? What steps will you take to improve it?

PS I will include in my evaluation of your participation *class respect*: do you respect the class environment (supportive of others’ comments, respectful when they are talking; respectful of need to share “air time,” maintain continuity of discussion, not buried in your laptop, etc.)?