

University of Montana College of Business
MBA 694 (Section 60) – MSBA Capstone (3 credits)

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class time: Wed, 4-650pm

office hours: Wed, 3-4pm and by appointment

class location: Zoom at <https://umontana.zoom.us/my/jasonmw>

Effective writing comes down to knowing what you're talking about and sounding like you know what you're talking about – that goes for introductory composition essays and graduate analytics projects alike. The means for making a quality argument about a quantitative matter are more prescribed than in a personal essay or text analysis, but the principles of good writing are the same: clear assertions, direct prose and solid inferences. Together, this semester, we'll work together to demonstrate the skills you have acquired during your MSBA, primarily through original work on a dataset, complemented by a writing up that work in a more-or-less traditional report as well as a brief oral presentation and poster synopsis.

That last sentence says “more-or-less traditional” because, if you can write for an audience that will read even if they are not your captive, you will go far. In my judgment, teachers fail students by tolerating – in fact, creating – an expectation of often mediocre, mechanical written communication. You don't need to write like you're publishable to pass this course, but I'd sure appreciate reading something that doesn't seem like it was cranked out just to meet a requirement. (It's a requirement, I know.) More importantly, people who aren't your captive audience might also read what you write, and who knows where that can take you.

I'd like to structure the class with the smallest amount of didacticism compatible with your success. The extremes between which we'll seek a balance are, on one hand, a simple deadline for a finished product (or complete draft) and, on the other, a rigid schedule of deliverables. These extremes would not serve you well either, especially as it pertains to the form rather than content of the course: I don't expect you to know how to scope a project and schedule all the elements comprising it so you meet a distant deadline; similarly, I don't expect the order I would do those things, or that your colleagues would, to fit you. Therefore, I want to provide you an experience that mimics a healthy relationship with a supervisor, where you strive toward goals you've set, and I assist with choosing milestones and working toward them. This more closely mimics what you'll find while doing analysis for clients, and I hope it will be more rewarding.

To wit, I expect our regular time together to include some recurring features:

1. Each week, each student submits a Progress, Plans and Problems update, including an accounting of time spent on the project, in the Capstone channel of Teams by 4pm Tuesday preceding Wednesday's class. Two or three students will discuss with the class the following day; we'll rotate, and you'll know when your turn is coming. If you miss the synchronous class meeting, you will be expected to offer feedback in a short video after watching the class recording.
2. Discussing other writing about data analytics will provide inspiration or caution. Required reading will be made available by noon on Fridays preceding the class where the reading will be discussed, i.e. a reading for Wed, Jan 20, will post by noon on Fri, Jan 15.
3. I will lecture on specific elements of the analysis or reporting you're doing; a schedule of those lectures is outlined below in the Class Schedule. Those lecture topics are based on my experience of this course, but I am willing to take input from you about the topics that I'll be presenting. None of the material for this course is canned, and I'm willing to do my work alongside you but have little interest in telling you how to do something you're already informed about or not interested in learning about.

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COB and MSBA Mission Statement and Assurance of Learning

The College of Business (COB) at the University of Montana creates transformative, integrated, and student-centric learning experiences, propelling our students to make immediate and sustained impact on business and society. We nurture our students' innate work ethic to develop confident problem solvers and ethical decision makers. We pursue thought leadership and collectively create opportunities for a better life for our students, faculty, and staff.

COB Core Values:

- Students first: We educate the whole person
- Experiential learning: We create experiences that matter
- Thought leadership: WE create rigorous and relevant knowledge
- Stewardship: We value people, planet and profit

The mission statement for the MS in Business Analytics program is as follows:

The MS in Business Analytics prepares graduates for successful careers working with data across a wide range of organizations. Students build a strong foundation at the intersection of business, statistics, and computing. In addition to a firm grounding in analytical techniques and applications, students gain the ability to effectively communicate and use the results of data analytics for innovative solutions to catalyze business growth. Graduates are deeply engaged with the private and public sector, acquiring relevant skills to provide immediate value to employers.

As part of our assessment process and assurance-of-learning standards, the MSBA program has adopted five learning goals for our students.

The MS in Business Analytics graduates will possess:

1. **Knowledge:** A deep understanding of a wide range of analytical techniques and programming tools for both structured and unstructured (e.g., text, sentiment) data.
2. **Application:** The ability to apply appropriate analytical techniques to solve a wide variety of business/organizational problems.
3. **Communication/Story Telling:** The ability to effectively: (a) communicate data analytics results and translate these into effective business decision making inputs; (b) use data visualization techniques to illustrate results and implications; and (c) write an impactful narrative supporting key insights and implications from an analysis.
4. **Ethics/Data Stewardship:** The ability to act as effective data stewards, applying governance techniques to secure data, to develop and promote policies for using data in an ethical manner, to respect data privacy considerations, and to enforce data compliance.
5. **Innovation:** The ability to innovate beyond providing answers to existing questions and solutions to known problems by harnessing data analytics to identify new sources of value, to see patterns and anomalies, and to reveal new insights.

MSBA Capstone Learning Goals

Significant thought has been put into how this capstone course fits in with the overall mission and learning goals of the MSBA. With thanks for the exact language to Jakki Mohr, who taught this course for its first two years, and the others who designed the MSBA and the capstone component, in the MSBA capstone, each student will be expected to demonstrate proficiency across three of the five learning objectives for the program:

Knowledge -> ... of a wide range of analytical techniques and programming tools for both structured and unstructured (e.g., text, sentiment) data.

Application -> ...of appropriate analytical techniques to solve a wide variety of business/ organizational problems.

Communication/Story Telling -> ...of data analytics results ... through effective business decision making inputs ... data visualization techniques ... impactful narrative supporting key insights from analysis.

Specifically, the MSBA encompasses the learning objectives and outcomes through which students will demonstrate proficiency. Failure to complete any of the items below will seriously compromise your grade in the course.

Learning Objectives	Learning Outcomes
Conceptualizing and completing a capstone project as an integrative experience for the program	Scope a data science project; articulate the research question(s); select and explain appropriate variables; select and accurately use an appropriate analytical method;
Presenting the capstone project in a conference-like format for business professionals.	Communicate results and implications effectively with non-technical managers and executives, through visual storytelling, written, and oral communications.
Learning to give and receive professional peer feedback	Peer Feedback Sheets
Mentor up-and-coming professionals	Reflection to me on Slack

Policies

Accommodation for People with Disabilities Available

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you have a disability that adversely affects your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. Regardless of your registration status, I will work with you and Disability Services to provide an appropriate modification.

Academic Honesty and Code of Conduct

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. The University of Montana Student Conduct Code specifies definitions and adjudication processes for academic misconduct and states, "Students at the University of Montana are expected to practice academic honesty at all times." (Section V.A., available at <http://www.umt.edu/student-affairs/dean-of-students/default.php>). All students need to be familiar with the Student Conduct Code. It is the student's responsibility to familiarize themselves with the COB Code of Professional Conduct at <http://www.business.umt.edu/ethics/professional-conduct-code.php>.

Attendance

All students are expected to attend class in person or through Zoom unless hardship prevents it. Please notify me by Slack or email if you will miss a class. If group activities such as presentations, peer feedback or discussion of readings are impacted by your absence, you will be expected to make up the activities.

Brief and occasional lapses for reasons of illness, injury, family emergency, religious observance, cultural or ceremonial events, or participation in a University sponsored activity may be excused. Lapses for reasons of military service or mandatory public service shall be excused. Full details on UM's attendance policy can be found [here](#).

Emergency Procedures

In the event of a campus emergency during class, please follow instructions provided by your instructor or the UM emergency alert system. Failure to do so could hamper efforts to resolve the emergency situation in a safe, timely manner. A video explaining UM emergency procedures can be found [here](#).

Online Participation and Expectations of Availability

This course will rely on Teams for a substantial amount of communication. Each day, you should be checking the Capstone channel of the [UMT Analytics Team](#) and, in the event that I mention you or @channel so you get notified, please check ASAP. I appreciate it if you leave some relic (like a brief comment or emoticon) of having read announcements. I'll reciprocate.

For communication to me, you may send direct messages through Teams, Slack (I'm still over there but we should all be moving to Teams so please make that transition) or email. You can expect a response within 24 hours, often the same day. If I email with information, I will mention the need to check email in Slack.

Professional Demeanor

A productive learning community requires graciousness and collegiality. Your conduct when we convene and in the forums we share should welcome participation and respect the dignity of your interlocutors. Beyond those basic requirements, the capstone course is a collaborative learning environment that benefits from horizontal knowledge transfer - which means everyone will need the space to show work in progress and everyone can potentially benefit from constructive contributions by peers. I will work to model this behavior, accept feedback about how well I do so, and expect the same from each of us.

Assessment

The following factors will be weighted as shown when determining a final grade for this course. The project will be assessed with respect to the quality of the analysis and engineering conducted as well as the form in which the work is presented. Revision of project submissions will be permitted through the final April 28 deadline, provided sufficient progress is made between drafts, until you are satisfied with your performance.

<i>Project and Write-Up</i>	70%
<i>Project Presentation</i>	10%
<i>Participation, including work-in-progress presentations, peer feedback, and workshops</i>	20%

Numerical scores translate to letter grades as follows:

A	93% and above
A-	90% to 92%
B+	87% to 89%
B	83% to 86%
B-	80% to 82%
C+	77% to 79%
C	73% to 76%
C-	70% to 72%

D+	67% to 69%
D	63% to 66%
D-	60% to 62%
F	Below 60%

Capstone Project Evaluation Rubric

Capstone projects will be evaluated according to the following criteria, with intermediate grades possible if a project achieves benchmarks at different levels of the rubric. With the ability to revise and resubmit project work, you should be able to attain the grade that you want, and I am happy to check in on your progress at any time. *A note on version control: My preference is that you use a private repo on Github for version control and [invite](#) my account, techxorcist, to collaborate on that repo; if you have a different preference, please let me know.*

A: These projects demonstrate a clear and nuanced understanding of the subject, making sophisticated judgments and design decisions. Judgments and design decisions are supported with compelling reasoning and evidence, avoiding unsound or invalid conclusions. Project write-ups proceed logically with supporting tables, figures and diagrams as warranted by the text and supplemented in appendices. Code development is documented in a version control system; data is accessed and manipulated programmatically.

B: These projects demonstrate a clear understanding of the subject, making logical judgments and design decisions. Judgments and design decisions are supported with reasoning and evidence, largely avoiding unsound or invalid conclusions. Project write-ups proceed logically with supporting tables, figures and diagrams as warranted by the text and supplemented in appendices. Code development is documented in a version control system.

C: These projects demonstrate understanding of the subject, making obvious but logical judgments and design decisions. Judgments and design decisions are sometimes supported with reasoning and evidence but sometimes result in unsound or invalid conclusions. Project write-ups are formulaic and may be missing supporting tables, figures and diagrams as warranted by the text or draw little distinction between what is required by the text and should be in appendices. Code development is not documented in a version control system.

D: These projects demonstrate partial but unfocused understanding of the subject, making inappropriate judgments and design decisions. Judgments and design decisions lack reasoning and evidence but sometimes, regularly resulting in unsound or invalid conclusions. Project write-ups are incomplete and lack supporting tables, figures and diagrams as warranted by the text and little distinction between what is required by the text or draw little distinction between what is required by the text and should be in appendices. Code development is not documented in a version control system.

Additional Course Information

Over the course of the term, the class will develop a shared understanding of what makes a complete and useful data analytics report, however, as you are structuring your work on your project, it is useful to have milestones in mind. Therefore, from the outset, here are some typical data analytics reporting milestones:

- Data set preliminarily clean and complete
- Exploratory data analysis (descriptive statistics, visualizations)
- Review of applicable secondary sources
- Clear statement of research question and/or development goal
- Additional data collection and cleaning, if required, or certification that the basis for analysis/engineering has been established
- The heart of the matter, either the hypothesis being evaluated and the elements to support a conclusion or the thing that you are building and the material with which you did that

- Writing the thing – Stitch it together into a draft!
- Elevator pitch / slide deck / blog post – How are you going to get your work noticed?

Class Schedule with Major Deadlines

In addition to the items below, each class meeting will feature a deep dive on two or three projects and several weeks (tending toward the early part of the semester) will include readings.

January 13 – Introduction and Overview / Kickoff presentations

January 20 – Lecture: Exploratory Data Analysis, Descriptive Statistics

January 27 – Lecture: Literature Review, Research Question

February 3 – One-on-ones

February 10 – Lecture: Hypotheses, Variables, Inferential and Predictive Statistics

February 17 – Lecture: Presenting Results and Findings

February 24 – Lecture: Limitations, Recommendations, Implications, Conclusion, Storytelling

March 3 – One-on-ones

March 10 – TBD based on what's needed headed into finalizing drafts

March 17 – Work session

March 18 – Preliminary write-up submitted before 5pm

March 24 – One-on-ones

March 31 – Workshops

April 7 – Lecture: Posters and Presentations

April 14 – Student Presentations

April 21 – No class: You will instead mentor groups in Jason Triche's *Introduction to Data Analytics* classes, signing up for a session on April 15, 20 or 22 during IDA's meeting time, which is 1230-150p and 200-320p

April 21 – Posters for virtual MSBA Showcase submitted before 5pm

April 28 – Final write-up submitted before 5pm