

## BMKT 699 – MSBA Capstone (3 credits) Syllabus



Spring 2025 (offered only spring semesters)

W 4:00-6:50 PM MT, GBB 205

Zoom link: <https://umontana.zoom.us/j/93500457904>

The University of Montana College of Business

Andrew Connor, MSBA

Office hours by appointment

Email is the best way to communicate with me: [andrew.connor@umt.edu](mailto:andrew.connor@umt.edu)

The primary way I will distribute class updates will be over email to your UM email address, so please keep an eye on your inbox. (I will also plan to send updates over Teams as well, as possible)

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### College of Business Mission Statement and Assurance of Learning

The College of Business 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

### MSBA Mission Statement

The MS in Business Analytics trains graduates for successful careers working with data across a wide range of organizations by building a strong foundation in the intersection of business, statistics, and computing. In addition to learning solid analytical techniques and applications, students gain the ability to effectively communicate and utilize the results of data analytics for innovative solutions to catalyze business growth. Graduates are deeply engaged with the private and public sector to acquire relevant skills to provide immediate value to employers.

### MSBA Learning Goals

- **Knowledge and Application:**
  - An understanding of a range of analytical and programming techniques
  - Ability to apply appropriate techniques to solve a variety of business/organizational problems
- **Communication:**
  - Ability to effectively communicate data analytics results and translate into business decisions.
  - Ability to effectively use data visualization techniques.
- **Ethics/Data Stewardship:**
  - An understanding of ethical implications of data stewardship and privacy.
- **Innovation:**
  - Ability to harness data analytics to identify new sources of value and to reveal innovative insights.

## Drops and Incomplete Grades

- This course follows published UM policies on drop dates and incomplete grades. You can read that policy in detail here: <http://www.umt.edu/withdrawal/stories/incomplete.php>
- Drop dates and policies are subject to change every semester. Details and specific dates can be found here: <https://www.umt.edu/registrar/students/default.php>

## Incompletes

Policy per the UM catalog: "Incomplete grades are not an option to be exercised at the discretion of a student. In all cases it is given at the discretion of the instructor within the following guidelines. A mark of incomplete may be assigned students when (1) the student has been in attendance and doing passing work up to three weeks before the end of the semester, and (2) for reasons beyond the student's control and which are acceptable to the instructor, the student has been unable to complete the requirements of the course on time. *Negligence and indifference are not acceptable reasons.*"

## Academic Misconduct

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. **IMPORTANT: It is the student's responsibility to be familiar with the [Student Conduct Code](http://www.umt.edu/student-affairs/community-standards/default.php), including definitions of academic misconduct.** (Found online at: <http://www.umt.edu/student-affairs/community-standards/default.php>).

The College of Business endorses academic honesty as a pillar of integrity crucial to the academic institution. Academic honesty is an important step towards developing an ethical backbone needed in a professional career. Failure to practice academic honesty is considered academic misconduct. Academic misconduct will be penalized to the fullest extent. Students are expected to:

- Be knowledgeable of activities that are considered academic misconduct, as defined in section V.A. of 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.

Confusion may arise in what is and is not academic misconduct. Students should ask if they are unsure if a behavior will be viewed as academic misconduct. A good rule of thumb is that any credit-earning activity in a course should represent the true skills and ability of the person receiving the credit. A partial list of situations that are considered academic misconduct is in the [COB Professional Code of Conduct](http://www.business.umt.edu/ethics/professional-conduct-code.php) (found online at <http://www.business.umt.edu/ethics/professional-conduct-code.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.

## 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: [https://www.youtube.com/watch?v=iZ\\_9\\_Oj9ec4](https://www.youtube.com/watch?v=iZ_9_Oj9ec4)

## Accessibility Statement for Disability Equity

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, [ode@umontana.edu](mailto:ode@umontana.edu), or visit [www.umt.edu/disability](http://www.umt.edu/disability) for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

## Grievance Procedures

The formal means by which course and instructor quality are evaluated is through the written evaluation procedure at the end of the semester. The instructor and department chair receive copies of the summary evaluation metrics and all written comments sometime *after* course grading is concluded. Students with concerns or complaints during the semester should first communicate these to the instructor. This step almost always resolves the issue. If the student feels that the conflict cannot be resolved after meeting with the instructor, the student should contact the department head. If, after speaking with the department head and the instructor, the student still feels that the conflict has not been resolved, contact the Associate Dean of the College of Business.

## Professionalism

Students are preparing to become business professionals, and professional behavior is expected at all times. Students are expected to abide by the [COB Code of Professional Conduct](http://www.business.umt.edu/ethics/professional-conduct-code.php) (found online at <http://www.business.umt.edu/ethics/professional-conduct-code.php>). Treat class sessions like business meetings. Failure to adhere to these expectations may result in being asked to leave the classroom. In addition, students will:

- Refrain from using any technology, including cell phones, not required for the class conduct at that time;
- Be active listeners – not talking while others, including the instructor, are talking, and;
- Participate in class activities, conversations and work sessions.

## Email

According to University policy, faculty may only communicate with students regarding academic issues via official UM email accounts. Accordingly, students must use their UM accounts. Email from non-UM accounts will likely be flagged as spam and deleted without further response. 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. All email communications should be professional in tone and content. A professional email includes a proper salutation, grammar, spelling, punctuation, capitalization, and signature. Please check your UM email daily so you won't miss important class and COB announcements.

## Class-Specific Details

### Course Description from Catalog

BMKT 699 – Capstone. 3 Credits. Prereq., BMKT 642, BMKT 670, and BMIS 625. Coreq., BMIS 601, BMKT 680, BMIS 650 or director consent. Graduate level standing. Using a project-based approach, the course enables students to synthesize domain knowledge, apply their technical skills, and convey results of their data analysis through data visualizations and clear written and oral communication skills to achieve an integrative perspective of business analytics.

### Course Outcomes

Students will satisfy the MSBA Learning Goals in this course by:

- Conceptualizing and completing a Capstone project and related work that demonstrates a solid grasp on the application of data analysis and engineering techniques;
- Sharing the process and outcome of their project in a written piece that meets professional standards and is written for a non-technical business management-level audience;
- Creating a well-structured GitHub repo with well-commented code that conforms to style guide requirements, conveying all technical details of the project and allowing for replication;
- Communicating their work to a non-technical audience with a “digital product” (e.g., a dashboard, interactive tool, well designed infographic, etc.) that summarizes the depth and breadth of their project for the viewer/user, and supplementing the user/viewer experience with conversational dialogue to answer questions and clarify unclear aspects of the project;
- Presenting their work for a mixed technical/non-technical audience in a live in-person or virtual setting and effectively answering questions from that audience;
- Completing assigned readings and assignments;
- Participating in class discussions;
- Sharing project progress in 1-on-1 meetings with the professor and in class work sessions, and;
- Completing formal peer review activities.

These Capstone projects have a tendency to be either more analysis-focused or more engineering-focused. It is natural for one of those aspects (analysis or engineering) to be quite a bit more substantial than the other, but I will require that each project have at least some amount of both. For example, even if your project is about building a pipeline to retrieve data from an API, process it and feed a reporting dashboard you built, I might require you to add some analytical component for the sake of the project. Or conversely, if you are focused on building models to analyze data that you already have in-hand, I might ask you to engineer a system that would allow you to acquire, clean and prepare new data to perform analyses in the future. Some of this work may feel superfluous or secondary to your project, but I want to make sure you demonstrate at least some competency in both engineering and analytical aspects of the work.

### Attendance & Participation Expectations

This course is offered in two modalities:

- Live but remote (via video call)
- Asynchronous (via recorded class sessions with additional participation assignments)

Students taking the class live are expected to actively participate in class discussions, activities, and work sessions. **Students attending asynchronously are expected to watch all class recordings** and will have assignments to complete in order to fulfill their participation component. Everyone is asked to actively respond to class session

materials using Teams, Canvas forums, recorded responses, and other ways of engaging with the rest of the class. Engagement will make up part of your grade (see Rubric below), and this will be made up of a combination of your in-class presentations and, our 1-on-1 meetings, your engagement in class work sessions and conversations, and your work on peer reviews.

## Course Assistance

My role in this course is to make sure that you complete at least a satisfactory Capstone project and to push you to pursue excellence in your work. I am very available to support you in every step of the project, so if you are struggling with anything, please reach to me out immediately so that we can make a plan to solve whatever issues you are dealing with and move your project forward. The sooner we address any challenges you are facing, the better.

I do not have regular office hours scheduled, but I am always happy to find a time to schedule a meeting. Just email me.

I also suggest that you take advantage of other university resources such as the Writing Center (<https://www.umd.edu/writing-center/>) and MSBA faculty members.

## Course Materials

There are no outside materials required for this class beyond what each student needs to perform their respective projects and related deliverables. I will share some digital materials, but there is nothing you need to acquire on your own.

## Requirements

The following are things that you must do in order to pass the Capstone class. You will not receive specific discrete grades on each individual activity, but they are required. The participation component of your grade will be affected by the degree to which you fulfill these and the quality of your efforts:

**IF YOU DO NOT MEET MINIMUM STANDARDS FOR THESE REQUIREMENTS I WILL ASK YOU TO TAKE SOME REMEDIAL ACTION IN ORDER TO PASS THE COURSE.**

### WEEKLY POSTS – 3 P’S

- Create a file called “three\_ps\_[your last name here].txt” in your GitHub repo.
- Each week add a new section (marked with the date) to the top of that text file and answer the following:
  - Progress: What have you accomplished since last week’s post?
  - Problems: What are you stuck on or struggling with?
  - Plans: What do you intend to accomplish between now and next week’s post?
  - How many hours did you spend working on your Capstone since last week’s post?
- These do not need to be long responses. Very brief summaries are sufficient.
- Push these updates to your GitHub repo no later than Noon MT on Tuesday each week (starting the week after our first class).
- Please put these on your calendar to do, so that I do not need to constantly send reminders.

### 1-ON-1 MEETINGS WITH ANDREW

- I will be having 1-on-1 Zoom calls with each of you during class time on the following dates to track your progress over the course of the semester (we do not have regular class on these days):

- Wed., Jan. 29<sup>th</sup>, 4:00 – 6:50 PM MT
  - Please fill out this form with updated/revised information before Noon on Tues., Jan. 28<sup>th</sup>:
    - <https://forms.gle/fa8UmomXrr6yDKMA>
- Wed., Mar. 12<sup>th</sup>, 4:00 – 6:50 PM MT
- Wed., Apr. 2<sup>nd</sup>, 4:00 – 6:50 PM MT
- You can sign up for slots on those days on this form (on the “1\_on\_1\_meetings” tab):
  - [https://docs.google.com/spreadsheets/d/1J8tyYbObReEYu2yNXhmvBBS26N\\_H4iVVp9ysm7TCZXg/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1J8tyYbObReEYu2yNXhmvBBS26N_H4iVVp9ysm7TCZXg/edit?usp=sharing)
- If you are an asynchronous student, and you cannot make it to a slot during those times, please reach out to me to schedule another time to meet.

### SHARING YOUR IN-PROCESS PROJECTS AT IN-CLASS WORK SESSIONS

- All students will present their in-progress work once in class for a work session between Feb. 5<sup>th</sup> – Mar. 5<sup>th</sup>.
- It does not matter what stage of development your project is at for these work sessions. We will attempt to support the advancement of your work with good questions and feedback, and will also use discussion of these projects as opportunities to review important concepts and learn about how to approach different forms of “real world” problem solving.
- Those sessions will involve a concise presentation by you, followed by questions and discussion of your project with your classmates and visiting professionals.
- I am working on lining up outside professionals to join us in class, and I’m scheduling them according to project content. The expectation is that you will be attending class live during the week you have scheduled your work session.
- At your session, please be prepared to share the following:
  - Where/how did this work originate?
  - Who is your client?
  - What are the questions you are trying to answer or the problems you are trying to solve?
  - Why is this interesting and/or valuable?
  - What is the current status of your work?
  - What challenges have you already faced or do you expect to face?
  - What questions do you have? What do you not know or need to figure out?

### File Naming Convention

Except where otherwise requested, please use the following format for naming all files submitted in this course:

[description]\_[your last name]\_[date formatted yyyyymmdd]\_[version # if appropriate].[file extension]

For example: digital\_product\_draft\_connor\_20241016\_v2.pbix

Please use all lowercase letters and underscores instead of spaces.

### Clients

All students must have a client that their project is serving. In many cases, this will be an actual client, a literal individual, department, organization, or business, for who has a need that the project is serving. If a student is working on a project that arises from their own interest in doing a particular kind of work or focusing on a specific topic that does not have a clear client, they will need to find a “proxy client” to act as a stand in for a real client.

The commitment on the part of this proxy client will be minimal, but there will be a few small asks for feedback over the course of the semester.

At the beginning of the semester, each student will need to identify the client (or proxy client) and their primary contact person (or people) who will serve as the client's liaison (if appropriate).

## Deliverables

The below are the concrete products of your work on the Capstone project. These are the materials that will be evaluated for the bulk of your grade. **All deliverables (drafts and final versions) will be submitted through Canvas.**

### WRITTEN PRODUCT

- Project work needs to be synthesized and shared in a written piece that meets professional standards and is written for a non-technical business management-level audience.
- The purpose of this written product is to communicate your work to a competent person who might have no technical or subject-area knowledge about the topic you have chosen. You need to communicate to them where/how/why the project originated, why this is interesting and important, how you did the work you did, what the outcomes are, etc., and do it in a way that is clear and interesting.
- All students must identify a specific format and venue in which this piece will be "published" (e.g., a journal, blog, report for management, company website, etc.). There are a range of options for where this piece can be presented, as long as it has a specific audience that is someone other than just you and me. You will need to get this outlet approved in advance.
- The written products for different Capstone projects will have different needs and requirements, but it is safe to assume that most papers will include much of the following content in one form or another:
  - Introduction/Background
  - Overview
  - Context
  - Research questions or problem to solve
  - Data details
  - Code explanations
  - Systems built
  - Analysis
  - Visualizations
  - Limitations
  - Recommendations
  - Conclusion
- Please do not treat the above list as an outline for your paper, or an indication that you need to have a section labelled with each of those headers. This is not an academic-style paper with strict guidelines. Part of your challenge is to identify what best serves your project and what is important to communicate.
- That list is not set in stone. You will need to make judgment calls about what to include and what to omit, so please check in with me if you have questions about the nature or relevance of any of those sections.
- There is no firm length requirement for the written product, but it is safe to assume that you will probably need at least 10-12 single-spaced pages (not including appendices and visualizations) to get this done effectively and with adequate depth and substance.
- One note on writing style: Please write in active first-person (e.g., "I decided to use linear regression because...") rather than passive voice (e.g., "Linear regression was used, because...")

## PEER REVIEWS OF CLASSMATE WRITING

- In order to get some additional practice evaluating data science projects, you will be doing written peer reviews of a few of your classmates' in-progress written products.
- This will happen after I review the first draft of your written piece (due at the end of Spring Break) and before the final drafts are completed.
- I will put you in groups with other students, and each of you will do a peer review of the rest of your group members.
- You can download your group members' draft papers and review forms to fill out from Canvas.
- Note: In addition to receiving peer reviews on your work, your drafts will be shared with students in the MBA course, Strategic Management (BMGT 665), for feedback. MBA students are a similar audience to the non-technical audience for which you are writing, so they will be a good proxy to determine whether you are communicating your work effectively.

## GITHUB REPOSITORY & STYLE GUIDE-CONFORMING CODE

- All projects must have a dedicated and properly structured public GitHub repository, with all relevant code, project files (but no data or credential files) and a README file included.
- All code must be well-documented and be written and commented in conformity with your chosen code style guide(s).
- As a part of your end-of-semester submissions, you will be asked to submit several examples of code from your repo that demonstrate your adherence to style guide recommendations.
- Please invite this username to as a collaborator on the repository: *andrew-connor*
- NOTE: Your README file, code commenting, and other supporting documentation needs to be *very* detailed. You will be evaluated on how thoroughly you do this technical documentation and the degree to which this repo could be handed off to someone else for the purposes of replicating your work with no ongoing support from you.

## DIGITAL PRODUCT

- You will be creating a "digital product" to communicate your work to a non-technical audience. This could take the form of a dashboard, interactive tool, well designed infographic, website, or anything else that we discuss and I sign off on.
- The purpose of this piece is to summarize the depth and breadth of their project for the viewer/user who does not have the benefit of talking with you about the project or seeing a presentation. Given that, it needs to stand on its own, have clear explanations and ways of providing context. It needs to fully stand alone and give people a full understanding of your work without any external support.
- It is possible that you will generate this through the natural course of working on your project, but more than likely it will be something you have to create specifically for this purpose. You also might be able to take something that you are already creating for your project (e.g., a dashboard) and augment it with some things (e.g., detailed annotations and some explanatory slides).
- Please make sure that this product is dynamic and as interactive as possible. It should not just be a re-hash of your written product. It should tell the story of your work in a different and engaging way.
- These digital products will be reviewed by students in Jason Triche's BMIS 326 (Introduction to Data Analytics) class to test their effectiveness. The students will be reviewing them in advance and then asking you questions about your work, so please mark these dates/times on your calendar to be present (over Zoom) at that class to interact with his students:
  - Tues., April 29th: 11:00 AM – 1:50 PM MT

## IN-CLASS & CLIENT PRESENTATIONS



- Students are required to arrange a 10-minute final presentation of their work to their clients (or proxy clients). This presentation can be either virtual or in-person, and must allow time for Q&A.
  - This presentation should have no fewer than three representatives from the client (if your client is an individual, please tell me that in advance and we will work out an alternative plan.)
- Students must record this client presentation and Q&A session, and submit a link to the recording in Canvas no later than the date indicated on the below schedule.
- In advance of those client presentations, each student will do their final project presentations for the class on one of these three dates:
  - Wed., Apr. 16<sup>th</sup>
  - Wed., Apr. 23<sup>rd</sup>
  - Wed., Apr. 30<sup>th</sup>
- You can sign up for slots on those days on this form (on the “final\_presentations” tab):
  - [https://docs.google.com/spreadsheets/d/1J8tyYbObReEYu2yNXhmwBBS26N\\_H4iVVp9ySm7TCZXg/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1J8tyYbObReEYu2yNXhmwBBS26N_H4iVVp9ySm7TCZXg/edit?usp=sharing)
- These presentations will be no longer than 10 mins. long.
  - **Fair Warning:** I will be ruthless on the timing with these, since we will have little margin for error on the timing. Please ensure that you are under 10 minutes.
  - After each presentation, we will have 10-15 minutes of questions about your work. We will also be inviting outside professionals and others to join us to give you input and ask questions as well.
- In addition to delivering this presentation, you will also need to submit your presentation slides in Canvas no later than midnight on Wed., Apr. 30<sup>th</sup>.
- Word of advice on these: Practice! Practice! Practice! The more repetition you get going through these, the more comfortable you will feel, the better the presentation will be, and the more likely it is that you will finish in the allotted time.
- If you would like input or feedback on your slides or presentation in advance of delivering your presentation, please reach out to me. Otherwise, I will trust that you are feeling confident in what you are doing.

### Tentative Schedule (you will be notified of any updates/changes)

Below is a schedule of all of the relevant class dates, events, and deadlines for the semester. Color-coding notes:

- Note that all regularly scheduled class sessions when students are expected to attend in one way or another are white (note that on the days when we have 1-on-1 meetings scheduled you are expected to show up for a Zoom call during your slot, but do not need to be present for the entire class block).
- Regularly scheduled class sessions when we will not meet (and you are given time to work on your projects) are highlighted in light yellow.
- Dates that involve deadlines are highlighted in orange (note that some of these are on class days and some are on other days of the week).

**Dates are all class days (Wednesdays) unless otherwise noted:**

2025-Jan-22	Course introduction & project check ins (lecture as time permits)
Tue., 2025-Jan-28	<i>1-on-1 meeting scheduled, syllabus quiz completed, &amp; prep form submitted before Noon</i>
2025-Jan-29	1-on-1 meetings (meeting slots during class hours)
2025-Feb-05	Work sessions in class (lecture as time permits)
2025-Feb-12	Work sessions in class (lecture as time permits)

2025-Feb-19	Work sessions in class (lecture as time permits)
2025-Feb-26	Work sessions in class (lecture as time permits)
2025-Mar-05	Work sessions in class (lecture as time permits)
<i>Sun., 2025-Mar-09</i>	<i>First draft of code submissions 1 &amp; 2, and GitHub repo update due before midnight</i>
<i>Tue., 2025-Mar-11</i>	<i>1-on-1 meetings need to be scheduled, confirmation of client presentation scheduling, and proposal for written product outlet before noon</i>
2025-Mar-12	1-on-1 meetings (meeting slots during class hours)
2025-Mar-19	NO CLASS: Spring Break
<i>Sun., 2025-Mar-23</i>	<i>First draft of written product due before midnight (feedback returned before Apr. 2)</i>
2025-Mar-26	NO CLASS: Work on digital products, codes and GitHub repos, presentation, etc.
<i>Sun., 2025-Mar-30</i>	<i>First draft of digital product, code submissions 3 &amp; 4, and GitHub repo update due before midnight</i>
<i>Tue., 2025-Apr-01</i>	<i>1-on-1 meetings need to be scheduled before noon</i>
2025-Apr-02	1-on-1 meetings (meeting slots during class hours)
<i>Tue., 2025-Apr-08</i>	<i>Revised version of written product for peer reviews due before midnight</i>
2025-Apr-09	NO CLASS: Peer review work this week
<i>Tue., 2025-Apr-15</i>	<i>Peer reviews due at midnight</i>
2025-Apr-16	Presentations in class (1/3 of students go this week)
<i>Mon., 2025-Apr-21</i>	<i>Intermediate draft of digital product due before midnight</i>
2025-Apr-23	Presentations in class (1/3 of students go this week)
2025-Apr-30	Presentations in class (1/3 of students go this week)
2025-Apr-30	<i>Final presentation slides for everyone due before midnight</i>
<i>Tues., 2025-Apr-29</i>	<i>Attend BMIS 326 for digital product review with students (11:00 AM – 1:50 PM MT)</i>
<i>Sun., 2025-May-04</i>	<i>Final draft of written product, digital product, and code submissions/GitHub repo, and video of client presentation due before midnight MT</i>
2025-May-07	NO CLASS: Exam Week (no final exam in this class)

### PLEASE NOTE THAT LATE WORK WILL NOT BE ACCEPTED.

If you have an emergency or some circumstances that lead to you expect you will miss a deadline for reasons outside of your control, please contact me to discuss it far in advance of the deadline. PLEASE NOTE: Just because you contact me does not mean that late work will necessarily be accepted, but it is better to have this conversation before you miss the deadline than afterward.

## Grading & Rubric

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

<b>Project Content</b> (includes the quality and substance of the project's underlying work)	15%
<b>Written Product</b> (the written paper detailing the project)	15%
<b>GitHub Repo &amp; Code</b> (both the repo structure and content and the code's style guide conformance)	15%
<b>Digital Product</b> (quality of the product itself and effectiveness at communicating the project)	15%
<b>Project Presentation</b> (including live/recorded presentation and response to questions)	20%
<b>Participation</b> (including work sessions, 1-on1 meetings, peer feedback, and general class engagement)	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%

## 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. **You must receive a grade higher than a C- (C or above) in this class to graduate from the MSBA program. I will only start a conversation with you about your grade if it looks like you might be on track to get a C- or below.** Otherwise, I am happy to discuss the trajectory of your work at any time and give you an approximation of the grade level of your work at that time, if you would like. So, if knowing where you stand in terms of grades is important to you before the end of the semester, please check in with me. If I don't hear from you, I won't bring it up, but I don't want anyone to be surprised about their grades.

Given that the final grade will be a composite of the elements described above, the final grade will of course be a combination of the student's total performance across those areas. Generally speaking, though, the following grades will reflect projects that fit the following general descriptions:

**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 (i.e., GitHub); code is written in conformance with a chosen style guide and is well-commented; data is accessed and manipulated programmatically. Presentations are well-rehearsed, compelling, thorough but concise, and are supported with high-quality slides. The digital product is well-designed, effective, and engaging.

**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 (i.e., GitHub); code somewhat conforms to style guide recommendations and is somewhat commented. Presentations cover all of the important aspects of the project, follow a logical flow, are within the allotted time and supported with appropriate slides. The digital product covers important aspects of the project and is visually interesting.

**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. The GitHub repo is unstructured or poorly structured; code is not commented or written in conformance with style guide recommendations. Presentations cover some, but not all, important elements of the project, and feel more like recitations of sections of the paper than well-considered presentations. Slides are formulaic, lack attention to design principles, or do not support presentation effectively. The digital product lacks some important content and/or lacks visual engagement and/or does not effectively convey the project.

**D/F:** 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. Project is not fully documented in GitHub; code is poorly written and uncommented. Presentations do not cover most important elements of the project, are not practiced or well-planned, and/or run over time. Slides are ineffective or non-existent. Digital product lacks important content and/or visual elements and/or is poorly laid out.

### Advice for Success

- Get started early.
  - The more quickly you get your project up-and-running, the more time you will have to refine it and advance the quality of your work. You will be much happier if you frontload your work and are not scrambling at the end of the semester to get work done.
- Ask for help.
  - Between me, the rest of the MSBA faculty, your classmates, and others, there are many resources to help make your project a success. Do not hesitate to reach out if you could use support or assistance.
- Push yourself.
  - If you invest in this Capstone project it can benefit you greatly after you graduate. Whether it is a gateway to data-related work you are interested in, an opportunity to build a relationship with a possible employer, or a calling card you can use to get (or discuss in) job interviews, this is a great opportunity to do substantial work that you will be proud of, and which can take your skills to a new level. Seize the opportunity.

### Books

Here is a list of some books that provide good general overviews of data science topics with an orientation toward accessibility and practical application (you do not need these for the class – this is just FYI):

- *Doing Data Science*; Cathy O'Neil & Rachel Schutt
- *Practical Statistics for Data Scientists, 2nd Edition*; Peter Bruce, Andrew Bruce & Peter Gedeck
- *Data Science for Business*; Foster Provost & Tom Fawcett
- *Data Science from Scratch, 2nd Edition*; Joel Grus
- *Python for Data Analysis*; Wes McKinney
- *Business Data Science: Combining Machine Learning and Economics to Optimize, Automate, and Accelerate Business Decisions*; Matt Taddy
- *Writing Science in Plain English*; Anne E. Greene