

# Course Syllabus for SIADS 699

## Course Overview and Prerequisites

The Capstone is a project-based course in which students propose and build end-to-end data science projects in their domains of interest. Students are asked to demonstrate mastery of data science concepts and methods from their MADS training and produce a creative, original, and technically rigorous portfolio piece. Projects will be supervised by instructors with regular peer review.

The core of this class is a group data science project which will be independently designed and executed by students. The intention is to create a resume-worthy portfolio project in a format that is ready to share and present with the broader community of data science professionals.

The following are prerequisites for Capstone 699:

- SIADS 694 & 695: Milestone II A and B
- 1 data science application course (currently, these are SIADS 680: Learning Analytics, SIADS 681: Health Analytics, SIADS 682: Social Media Analytics, SIADS 685: Search and Recommender Systems, SIADS 687: Introduction to Sports Analytics, and SIADS 688: Data Science for Social Good)

## Instructor and Course Assistants

- Instructors: Winston Featherly-Bean, Elle O'Brien, Michelle LeBlanc, Laura Stagnaro, Kyle Balog, Rachael Tatman, Eric Gilbert, and Anthony Giove
- Course manager: Kirtana Choragudi

## Course Communication Expectations

- Course-wide chat via Slack.
- Zoom office hours [bookable by appointment](#).

## How to Get Help

If you have questions concerning the degree program, encounter a technical issue with Coursera, or issues using Slack, please submit a report to the ticketing system at [umsimadshelp@umich.edu](mailto:umsimadshelp@umich.edu).

If you have an issue specific to the Coursera environment, you can also begin a [live chat session](#) with Coursera Technical Support (24/7) or view [Coursera troubleshooting guides](#). (you may be asked to log in to your Coursera account).

For questions regarding course content, refer to the Communications Expectations section.

## Weekly Readings or Textbook Information

- **Week 1:** Syllabus and course resources

- **Week 2 suggested reading:** *Get rid of AI saviorism*, by Shreya Shankar  
<https://www.shreya-shankar.com/ai-saviorism/>
- **Week 3 suggested reading:** None
- **Week 4 suggested reading:** Computing options reading
- **Week 5 suggested reading:** *How to Avoid Machine Learning Pitfalls*, by Michael A. Lones  
<https://arxiv.org/pdf/2108.02497.pdf>
- **Week 6 suggested viewing:** *Data engineering principles: build frameworks, not pipelines*. By Gatis Seja <https://www.youtube.com/watch?v=pzfgbSfzhXg>
- **Week 7 suggested reading:** *How to review code like a human*, by Mike Lynch  
<https://mtlynch.io/human-code-reviews-1/>
- **Week 8 suggested reading:** *The ghosts in the data*, by Vicki Boykis  
<http://veekaybee.github.io/2021/03/26/data-ghosts/>
- **Week 9 suggested reading:** *Closing the AI Accountability Gap: Defining an End-to-End Framework for Internal Algorithmic Auditing*, by Deborah Raji et al.  
<https://dl.acm.org/doi/pdf/10.1145/3351095.3372873>
- **Week 10 suggested reading:** *So your data science project isn't working*, by Jacqueline Nolis  
[https://inolis.com/blog/project\\_isnt\\_working/](https://inolis.com/blog/project_isnt_working/)
- **Weeks 11 & 12:** None

## Learning Outcomes

The core of this class is a group data science project which will be independently designed and executed by students. The intention is to create a resume-worthy portfolio project in a format that is ready to share and present with the broader community of data science professionals. Student groups will be submitting the following at the end of the course:

- A report that tells the story of your project. This can be formatted as a blog, a scientific manuscript, or something else.
- A GitHub repository full of the code required to reproduce your analysis and figures. Your repository should be documented with a nice, informative README so a data scientist from outside MADS could understand what you did!

And one of the following high-level overviews of your work designed to be shared:

- A 3-5 minute video from your team about what you made.
- A poster appropriate for a data science conference, such as the MIDAS Data Science Symposium.

Student groups will participate in a midway check-in meeting with the teaching team and submit three informal video stand-ups throughout the course.

## Course Schedule

All times are in Ann Arbor time (Eastern Time).

- **This course begins on February 6 and ends on April 29, 2024**
- Project proposals are due **February 26 by 11:59 PM**. This is the end of Week 3.

- Group video standups should be posted in Slack by 11:59 pm (Ann Arbor, Michigan time - Eastern Time) by the following days:
  - Tuesday, March 12 by 11:59 PM (the first day of week 5)
  - Tuesday, March 26 by 11:59 PM (the first day of week 7)
  - Tuesday, April 16 by 11:59 PM (the first day of week 10)
- Students are required to respond to 2 other teams about their standups by the end of the standup week (the following Monday at midnight EST).
- Teams must schedule a check-in meeting with their designated contact on the teaching team between **March 12 and March 26** (during weeks 6 and 7).
- Projects must be submitted to the instructional team by **April 22, 2024 at 11:59 pm**. *Note this is one week before the official last day of class!*

## Office Hours via appointment

You can book an appointment office hour with Dr. O'Brien at any time using the [online scheduler](#). If the available times don't work for your schedule, please contact Dr. O'Brien.

When you are assigned a mentor for your project (around week 4), you are encouraged to schedule meetings with them at your preferred pace. Some people like to check in regularly with their mentor, whereas others prefer only occasional check-ins.

## Grading

Course Item	Number of Points	Percentage of Final Grade
Team matching survey	2	2%
Project proposal	4	4%
Course policy quiz	1	1%
Midway check in with teaching team	4	4%
Weekly mini-deliverables	3 pts each, 8 assignments	24%
Standups & responses	4 pts each, 3 assignments	12%
Team project	50	50%
First & Final Week Reflections	1.5 pts each, 2 assignments	3%

<b>Total</b>	100	<b>100%</b>
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Note: All assignments are required to earn credit for this course.

Typically, group deliverables are assigned a single grade that applies to every member of the group. In extenuating circumstances, faculty reserve the right to apply individual grades to each team member based on their contributions to the project. You will be notified if this option is invoked.

## Late Submission Policy

Several assignments cannot be turned in late: the team-matching survey, your three standups, and your midway-check-in. Credit cannot be awarded for these assignments if they are incomplete.

All other assignments have a 10% penalty for each day they are late. This penalty is automatically assigned by Coursera.

## Letter Grades and Course Grades

Refer to the [MADS Assignment Submission and Grading Policies](#) section of the UMSI Student Handbook (access to Student Orientation course required).

The grading scale for this course is as follows- note that an A+ can only be awarded at the discretion of the instructors. An A+ is a mark of a truly distinguished final project, and they are rare.

A	90 %
B+	87 %
B	80 %
C+	77 %
C	70 %

D +	67 %
D	60 %
F	0%

## Academic Integrity/Code of Conduct

Refer to the [Academic and Professional Integrity](#) section of the UMSI Student Handbook. (access to Student Orientation course required).

## Generative AI policy

You are welcome to use ChatGPT and other generative AI tools. You must cite these tools when you turn in your work, though. You must also take full responsibility for your submissions—any coding or conceptual errors will be graded as your own, regardless of whether they came from ChatGPT. In other words: proofread everything that comes out of generative AI before you turn it in.

## Accommodations

Refer to the [Accommodations for Students with Disabilities](#) section of the UMSI Student Handbook (access to the Student Orientation course required). Use the [Student Intake Form](#) to begin the process of working with the University's Office of Services for Students with Disabilities.

## Accessibility

Refer to the [Screen reader configuration for Jupyter Notebook Content](#) document to learn accessibility tips for Jupyter Notebooks.

## Library Access

Refer to the [U-M Library's information sheet](#) on accessing library resources from off-campus. For more information regarding library support services, please refer to the [U-M Library Resources](#) section of the UMSI Student Handbook (access to the Student Orientation course required).

## Student Mental Health

Refer to the University's [Resources for Stress and Mental Health website](#) for a listing of resources for students.

## Student Services

Refer to the [Introduction to UMSI Student Life](#) section of the UMSI Student Handbook (access to the Student Orientation course required).

## Technology Tips

- Recommended Technology
  - This program requires Jupyter Notebook for completion of problem sets and Adobe or other PDF viewer for reading articles.
- Working Offline
  - While the Coursera platform has an integrated Jupyter Notebook system, you can work offline on your own computer by installing Python 3.5+ and the Jupyter software packages. For more details, consult the [Jupyter Notebook FAQ](#).