

Data Science Capstone

DATS 6501 - 10, Spring 2026

1 Meeting time and Location

- Meeting time: Wednesday, 12:45 PM - 3:15 PM
- Location: Corcoran Hall 207

2 Instructor

- Yuxiao (James) Huang
 - Email: yuxiaohuang@gwu.edu
 - Github: <https://github.com/yuxiaohuang>
 - Website: <https://sites.google.com/view/yuxiaohuang>
 - Office address: <https://gwu.webex.com/join/yuxiaohuang>
 - Office hours:
 - * See Section 15
 - * Note: If you would like to meet during my office hours, please email me with your Webex meeting room address to arrange a 20-minute appointment. This will ensure we have a scheduled time slot for a one-on-one meeting.

3 Course Prerequisites

- Students may enroll in the Capstone course after completing all GWU Curriculum courses or during the semester in which they are finishing their final required courses.

4 Course Description

- The Data Science Capstone is an intensive, project-based course that requires students to design, build, and deploy a machine learning or deep learning-powered proof-of-concept, presented as a web-based application (or a comparable platform). This capstone experience synthesizes the skills and knowledge gained in previous courses, with a focus on practical application in the real world.
- Working individually or in teams of up to three members, students will identify a meaningful problem to solve using machine learning or deep learning techniques, with the project topic subject to advisor approval. Upon completing the capstone, students must demonstrate their models' capabilities through a live, web-based application (or a comparable platform), which will also serve as a valuable addition to their professional portfolio.

5 Learning Outcomes

Upon successful completion of the Data Science Capstone, students will be able to:

- Identify and define a relevant, real-world problem that can be addressed through machine learning or deep learning, ensuring alignment with industry needs.
- Demonstrate proficiency in designing, building, and deploying a machine learning or deep learning-powered proof-of-concept that adds meaningful value to their portfolio, reflecting readiness for data science roles in industry settings.
- Integrate models into a functional, web-based application (or a comparable platform) that allows for user interaction and showcases the practical application of machine learning or deep learning techniques.
- Communicate their project's purpose, methodology, and results effectively to both technical and non-technical audiences, highlighting the value and potential impact of their solution.

6 Average Minimum Amount of Out-Of-Class or Independent Learning Expected Per Week

- Students are expected to spend a minimum of at least 5 hours of out-of-class or independent learning per week.

7 Deliverables

- Git repository
- Presentation

7.1 Git repository

The Git repository should include at least the following content:

- `readme.txt`, which explains
 - the problem addressed by the project
 - the proposed solution
 - the tech stack used
 - the steps to launch the demo
- `requirements.txt`, which specifies the packages and their version required by the project
- `src` folder, which includes the source code

7.2 Presentation

The presentation should include the following content:

- a slides deck, which explains
 - the problem addressed by the project
 - the proposed solution
 - the tech stack used
- A live, web-based (or a comparable platform) demo

8 Submission

- Git repository and slides deck will be due for submission through blackboard by 11:59 PM (Eastern time) on April 22.
- **Submission will no longer be accepted after the deadline, and will receive a grade of 0.**

9 Grading Scheme

- 100% Capstone project (1)
 - 50% Git repository
 - 50% Presentation

10 Grade Appeals

- A grade becomes permanent one week after you receive the grade.
- Grade appeals and questions must be raised in writing (email) within one week after the day on which the grade was received.

11 Letter Grade Distribution

| | |
|-----------|----|
| [93, 100] | A |
| [90, 93) | A- |
| (87, 90) | B+ |
| [83, 87] | B |
| [80, 83) | B- |
| (77, 80) | C+ |
| [73, 77] | C |
| [70, 73) | C- |
| <70 | F |

12 University Policies

12.1 University Policy on Observance of Religious Holidays

In accordance with University policy, students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance. For details and policy, see: <https://provost.gwu.edu/policies-procedures-and-guidelines>.

12.2 Academic Integrity Code

Academic Integrity is an integral part of the educational process, and GW takes these matters very seriously. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and in other ways outlined in the Code of Academic Integrity. Students accused of academic integrity violations should contact the Office of Academic Integrity to learn more about their rights and options in the process. Outcomes can range from failure of assignment to expulsion from the University, including a transcript notation. The Office of Academic Integrity maintains a permanent record of the violation.

More information is available from the Office of Academic Integrity at <https://studentconduct.gwu.edu/academic-integrity>. The University’s “Guide of Academic Integrity in Online Learning Environments” is available at <https://studentconduct.gwu.edu/guide-academic-integrity-online-learning-environments>. Contact information: rights@gwu.edu or 202-994-6757.

13 Support for Students Outside the Classroom

13.1 Virtual Academic Support

- A full range of academic support is offered virtually in fall 2020. See <https://coronavirus.gwu.edu/top-faqs> for updates.
- Tutoring and course review sessions are offered through Academic Commons in an online format. See <https://academiccommons.gwu.edu/tutoring>.
- Writing and research consultations are available online. See <https://academiccommons.gwu.edu/writing-research-help>.
- Coaching, offered through the Office of Student Success, is available in a virtual format. See <https://studentsuccess.gwu.edu/academic-program-support>.
- Academic Commons offers several short videos addressing different virtual learning strategies for the unique circumstances of the fall 2020 semester. See <https://academiccommons.gwu.edu/study-skills>. They also offer a variety of live virtual workshops to equip students with the tools they need to succeed in a virtual environment. See https://library.gwu.edu/events?order=DATE_ASC&format=workshop&open_to=GWorld&series=&category=&sponsor=&events_date_start=&events_date_end=&terms=&page=1.

13.2 Writing Center

GW's Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online. See <https://gwu.mywconline.com>.

13.3 Academic Commons

Academic Commons provides tutoring and other academic support resources to students in many courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, or access other academic support resources at <https://academiccommons.gwu.edu>. For assistance contact academiccommons@gwu.edu.

13.4 Disability Support Services (DSS) 202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact <https://disabilitysupport.gwu.edu> to establish eligibility and to coordinate reasonable accommodations.

13.5 Counseling and Psychological Services 202-994-5300

GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success. See <https://healthcenter.gwu.edu/counseling-and-psychological-services>.

14 Safety and Security

- In an emergency: call GWPD 202-994-6111 or 911.
- For situation-specific actions: review the Emergency Response Handbook at <https://safety.gwu.edu/emergency-response-handbook>.

- In an active violence situation: Get Out, Hide Out or Take Out. See <https://www.youtube.com/watch?v=CpBT6tAa0dY&feature=youtu.be>.
- Stay informed: <https://safety.gwu.edu/stay-informed>.

15 Tentative Schedule

| Date | Topic | Due before Class |
|-------|---|---|
| 01/14 | Capstone Information Session | |
| 01/21 | Office Hours | |
| 01/28 | Check-In Session: Review Problem & Data | <ul style="list-style-type: none"> • Register Group on Blackboard • Proposal for Problem & Data |
| 02/04 | Office Hours | |
| 02/11 | Check-In Session: Review Tech Stack & Solution | <ul style="list-style-type: none"> • Proposal for Tech Stack & Solution |
| 02/18 | Office Hours | |
| 02/25 | Check-In Session: Review Progress | <ul style="list-style-type: none"> • Progress Report |
| 03/04 | Office Hours | |
| 03/11 | Check-In Session: Review Progress | <ul style="list-style-type: none"> • Progress Report |
| 03/18 | Office Hours | |
| 03/25 | Check-In Session: Review Progress | <ul style="list-style-type: none"> • Progress Report |
| 04/01 | Office Hours | |
| 04/08 | Check-In Session: Review Progress | <ul style="list-style-type: none"> • Progress Report |
| 04/15 | Office Hours | |
| 04/22 | Check-In Session: Review Deliverables | <ul style="list-style-type: none"> • Git Repository • Slides Deck and Demo for Presentation |