

**DATS 6501 Data Science Capstone CRN 48177**  
**Tuesday 3:30 to 6:00 PM**

Prof: Brian Wright, PhD

Term: Spring 2019

Location: Gelman Library room 608

E-mail: [bwright6@gwu.edu](mailto:bwright6@gwu.edu)

Office hours: By Appointment

**COURSE DESCRIPTION:**

The goal of the Capstone Project is to apply the knowledge gained throughout the Data Science program into projects that include, whenever possible, real-world problems and data.

The process begins with identifying a problem to which data science methodologies can be applied, followed by establishing a problem statement and project plan. Collecting data in order to implement the appropriate analytic methods learned in the program is only begun after these initial steps have been completed and approved by the instructor. Research plans, problem statements, and project management disciplines all play a major role throughout this process. Problems and data can be defined from industry, government, non-governmental organizations (NGOs), or academic research through either sponsored projects provided by the department, partnerships with faculty or a student defined resource.

Students will work individually or in small groups (3 or less). A list of possible projects will be posted on blackboard so students can familiarize themselves with problems and select areas of interest. Through approval of Course Instructor, students are free to define a problem statement and use their own data.

**LEARNING OUTCOMES:**

Students will be able to:

1. Demonstrate an ability to handle a real-world problem in data science begin with problem definition through delivery of a solution.
2. Gain an understanding of the program management process as it relates to their project. This includes being responsible for establishing a project plan and delivering on time.
3. Demonstrate an ability in presenting material by delivering paper and poster presentation: from a proposal on how to approach the problem and their final solution.
4. Write a report on their project for evaluation by the course instructor. The report will be structured as a typical research paper.
5. Conduct and respond to criticism through peer-review

**Project Requirements:**

- Demonstrate ability to carry out a data science project from end to end.
- Demonstrate proficiency in preparation and walk through of a presentation
- Demonstrate ability to carry out a literature search and summarize the state of the art.
- Demonstrate ability to translate the project objects into a realistic work plan that draws on multiple people.
- Demonstrate ability to design and implement required software using tools such as R, MatLab, Python, and traditional programming languages such as C, C++ and Java.
- Demonstrate ability to professionally present the project plan and results.

**TENTATIVE COURSE OUTLINE, CLASS MEETS EVERY OTHER WEEK:**

Week	Topic	Comments
1	Overview of Expectations, Using Trello for Project Management, Problem Statement and Plan Development	January 22 <sup>nd</sup>
2	Project Options	February 5 <sup>th</sup>
3	Problem Statement Submitted/Discussed in Class	February 19 <sup>th</sup>
4	Project Plan Submitted and Presented in Class	March 5 <sup>th</sup>
5	Mid-Term Presentation	March 19 <sup>th</sup>
6	Working session	April 2 <sup>nd</sup>
7	Mock Presentations	April 16 <sup>th</sup>
8	Final Submission of Presentation and Project Due	April 30 <sup>th</sup>
9	Final Project Presentations	May 1 <sup>st</sup> – 3 <sup>rd</sup>

**PREREQUISITES:**

Students may enroll in the Capstone course upon completion of all GWU Curriculum courses or during the same semester a student is completing the last of these requirements.

**GRADING AND EXAMINATION POLICY:**

- Problem Statement and Project Plan - 30 pts
- Preliminary Report - 20 pts
- Final project presentation and Report - 50 pts

There may be a seminar or research days that students need to participate and present their proposals or final results during the semester. The results of the presentation and reports will be reviewed by the instructor. There may be a panel of judges for grading your final presentation at last of classes. Issues will be identified and managed to successful remediation. A letter grade will be given based on achievement on the project requirements listed above and class participation.

**REPORTS & PRESENTATIONS:**

There 3 major reports and presentations during the semester need to be uploaded to Blackboard:

1. Problem Statement and Project Plan
2. Preliminary Report
3. Final Presentation and Report

**SECURITY:**

In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.

**DISABILITY SUPPORT SERVICES (DSS):**

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations.

The University Counseling Center (UCC Phone: 202-994-5300) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems [Web Link](#). Services for students include:

- crisis and emergency mental health consultations
- confidential assessment, counseling services (individual and small group), and referrals

**ACADEMIC INTEGRITY:**

The code of academic integrity applies to all courses in the George Washington School ("Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information."). In the spirit of the code, a student's word is a declaration of good faith acceptable as truth in all academic matters. Cheating and attempted cheating, plagiarism, lying, and stealing of academic work and related materials constitute Honor Code violations. These will not be tolerated. Please become familiar with the code. All students are expected to maintain the highest level of academic integrity throughout the course of the semester. Please note that acts of academic dishonesty during the course will be prosecuted and harsh penalties may be sought for such acts. Students are responsible for knowing what acts constitute academic dishonesty. The code may be found at [Web Link](#)

**UNIVERSITY POLICIES:**

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. Faculty should extend to these students the courtesy of absence without penalty on such occasions, including permission to make up examinations. Faculty who intend to observe a religious holiday should arrange at the beginning of the semester to reschedule missed classes or to make other provisions for their course-related activities.

**EMAIL ETIQUETTE:**

In the age of technology, when most forms of communication are electronic, it is important to adopt a proper etiquette to communicate with one another. It is asked that students use salutation when sending emails to their instructors and also make sure to SIGN their name and include their class/section at the end of the email. The instructor reserves the right NOT to reply to emails that are not properly addressed or do not have a signature. Students should also use their GWU email for any correspondence with the instructors. Students are required to check their emails daily and especially the morning before class.

**AVERAGE AMOUNT TIME LEARNING PER WEEK:**

Students are expected to spend a minimum of 100 minutes of out-of-class work for every 50 minutes of direct instruction, for a minimum total of 2.5 hours a week. A 3-credit course should include 2.5 hours of direct instruction and a minimum of 5 hours of independent learning or 7.5 hours per week.