THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

DATS 6501 Data Science Capstone
CRN 25067
Monday 3:30 PM 6:00 PM

INSTRUCTOR:

Name: Amir Jafari, PhD
Term: Fall 2018
Campus address: BELL 105 - Mondays
E-mail: ajafari@gwu.edu
Office hours: By Appointment

COURSE DESCRIPTION:

The goal of the Capstone Project is to apply theoretical knowledge gained during the time at Data Science program into a realistic project that involves a real datasets. During the project, students are heavily involved in the process of finding areal-world data science problems and solving it. The Capstone Project begins from collecting data and processing it in order to implement the appropriate analytic methods that they learned in the program to the real-world problems. In this process, problem statements and definitions are playing major role in the Capstone and the datasets can be collected from industry, government, non-governmental organizations (NGOs), or academic research.

Students will work individually on a problem statement, typically specified by a faculty or the sponsor. The sponsor will usually be responsible for supplying the relevant data set. Research groups at GWU may propose projects. A list of possible projects will be posted in the blackboard so students can familiarize themselves with problems and find their interests.

By approval of Course Instructor, students are free to find their own problem statement and use their own data set. The final problem statements and the datasets will need a approval by the Course Director.

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. 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.

3. write a report on their project for evaluation by the course instructor. The report will be structured as a typical research paper.

4. work with the industry, government, non-governmental organizations (NGOs), or academic research groups.

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 (SUBJECT TO CHANGE):

Week	Topic	Comments
1	Introduction,	
2	Pre-proposal report	September 7th
3	Working session	
4	Final proposal report	September 21st
5	Working session	
6	Working session	
7	Working session	
8	Preliminary Presentation	October 15st
9	Working session	
10	Working session	
11	Working session	
12	Working session	
13	Working session	
14	Mock Presentation	
15	Final Project Presentation and Submission	December 7th

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:

- Proposal report, preliminary presentation - 30 pts

- Final report - 30 pts

- Final project presentation - 40 pts

There may be a seminar or research days that students needs 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 needs to uploaded to Blackboard:

1. Final Proposal

2. Final Report

3. Final Presentation

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.

COURSE CONTENT (SUBJECT TO CHANGE):

Week	Module	Topics
1	Introduction	Research topics, Internships, Data Sets Collections
2	Pre-proposal report	First Report submitted, Problem Statement
3	Working session	Discussion over the proposal, Problem definition
4	Final proposal report	Finalize the proposal
5	Working session	Finding solutions for Problem statement
6	Working session	Use Data Science Technique and algorithms
7	Working session	Discuss the preliminary results
8		Preliminary Presentation
9	Working session	First sanity check
10	Working session	Work on the results and solutions
11	Working session	Improve the results
12	Working session	Working on the final report draft
13	Working session	Working on the final presentation
14	Mock Presentation	
15	Final Project Presentation and Submission	

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.