CSCI 39575 // 3 credit course
Spring 2022: Tue|Thur – 5:35-6:50
Instructor: Ariel Avshalom
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Office hours: Tuesdays@4:30 or by appointment

About the course:

Graph theory is the study of relationships between elements in a set. It probably sounds tedious when defined this way, but that is because this is one of the most deceiving definitions out there. A set can be any number of objects which work in any number of ways and elements in a set could be numbers, cryptocurrencies, disease networks, love triangles (stable marriage is an interesting application of graph theory on the field called game theory) and everything else under the sun. It can even include bridges in a town, so in reality by taking this course you're signing up for a relationship course (all relationship advice tendered is hypothetical and should only be used after careful thought ☺). This isn't an easy course by any means, but it is my hope that it'll be both fun and rewarding!

Prereqs:

CSCI 23500 and MATH 15000

Text:

In this course we will be reviewing research papers in Graph Theory. The first few classes will be an introduction to graphs, simple graph algorithms and creating graphs in Python (slides and class notes will be provided for these lessons). After that we will be reviewing interesting papers in graph theory which will be chosen based on the class's interest.

Course Objectives:

First and foremost, we need to establish that this is an advanced course, one where you'll be expected to read graph theory papers and take part in discussions about the papers in the course. Before we get to that section we will cover the basics:

- Learn how to read a graph and draw a graph
- Learn how to program and display a graph using graph libraries in Python/R
- Learn about basic graph algorithms

Graph theory is the theory of relationships. It attempts to answer how we should look at interactions between various phenomena in nature. Some papers we might study could involve social networks (like Facebook), internet of things, and disease networks (like Covid-19). For now, these topics are TBD and may change depending what the class wants.

You're expected to complete assignments, take part in course discussions and read papers. You will also be writing on a topic of your choice in graph theory and presenting about it during the second half of the course.

Grading:

Homework: 40%

Participation: 10%

Projects: 50%

There will likely be 2 projects: a paper, and a group presentation. The course materials will be created (and taught) using Python but you can use any language you feel comfortable with. There will be one section of the course where we will use JavaScript/HTML/CSS (mainly the HTML part) to explore the Document Object Model and other interesting graph objects on the web.

I recommend that you make sure that whichever language you use has a good graph theory library (some of the good ones are available in Python, R and Javascript).

There will be no final exam in this course, but there may be quizzes which will be part of your participation grade.

Contacting Policy

Feel free to contact me regarding questions on homework or coursework. I try to respond to email in a timely manner and I can answer questions after the class as well.

When emailing me please include your name and question in the subject line and please make sure that you email csciprofessor+S22-39575@gmail.com (the + at the end of the address is a cool way to filter mail for Gmail addresses. Gmail will ignore everything after and including the + so the message will still arrive to me.)

Academic Integrity:
"The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for policy implementation can be found at www.brooklyn.cuny.edu/bc/policies. If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member MUST report the violation."

Disability Policy:
"In order to receive disability-related academic accommodations students must first be registered with the Center for Student Disability Services. Students who have a documented disability or suspect they may have a disability are invited to set up an appointment with the Director of the Center for Student Disability Services. If you have already registered with the Center for Student Disability Services, please provide your professor with the course accommodation form and discuss your specific accommodation."

Student Bereavement Policy:
Students who experience the death of a loved one should consult the bereavement policy available here: http://www.brooklyn.cuny.edu/web/about/initiatives/policies/bereavement.php

Religious Observances:
State law regarding non-attendance because of religious beliefs can be found in p. 66 of the Undergraduate Bulletin or p. 40 of the Graduate Bulletin).