GGS 675 – Location Science
Spring 2022 – Monday – 4:30 to 7:10
Classroom – Exploratory Hall - 2103

Instructors: Mike Wolf, PhD; Adjunct Professor
Email: mwolf7@masonlive.gmu.edu (best way to reach me)
Office: Exploratory Hall TBD
Office Hours: Monday (right after class) or by virtual appointment

Course Materials (recommended reference text):

- Introduction to Operations Research by Hillier and Lieberman

Course Materials (not required):

- Network and Discrete Location: Models, Algorithms, and Applications by Mark Daskin
- Location Science by Gilbert Laporte

Course Description:
This course presents the theory and practice of Location Science – the study of a branch of mathematics known as optimization and a tool called linear programming to optimally locate "things" given constraints, the optimal or near optimal spatial location and allocation of facilities, routes, personnel, or other assets. A variety of optimization procedures for location problems are presented, including minimum spanning tree, shortest path, maximal flow, and transportation problem algorithms. The peer-reviewed literature on location science is explored. The computer lab will be used as a means to enhance the subject materials using the Python programming language and Excel. Having prior experience working with Python is recommended, but not required. We will cover some basics in class.

Course Objectives:
This is an upper-level graduate course and so it is expected that one has advanced research abilities along with refined writing and programming skills. By attending class lectures, performing background topic research and independent study, students will be able to:

- Discuss various problems in location science.
- Develop the ability to effectively and authoritatively research and present executive summaries of location science problems.
- Ability to formulate and solve location science problems using various methods
- Most importantly, learn how to learn from each other in a collaborative environment.

Planned Schedule:

Date	Topic	Scope
1/24/2022	Introduction	Introduction, Classroom Conduct, Syllabus Review and What is Location Science?
1/31/2022	Network Optimization	Homework Assignment #1
2/7/2022	Network Optimization	
2/14/2022	Simplex Method	Homework Assignment #1 Due Homework Assignment #2
2/21/2022	Simplex Method	
2/28/2022	Classic Transportation Problem	Homework Assignment #2 Due Homework Assignment #3
3/7/2022	Classic Transportation Problem	
3/21/2022	First Problem Formulation	First Formulation Presentation
3/28/2022	P Median Problems	Homework Assignment #3 Due Homework Assignment #4
4/4/2022	P Median Problems	
4/11/2022	P Center Problems	Homework Assignment #4 Due Homework Assignment #5
4/18/2022	Heuristic Modeling & Simulation	
4/25/2022	Heuristic Modeling & Simulation	Homework Assignment #5 Due
5/2/2022	Second Problem Formulation	Second Formulation Presentation

Grading Policy:

***Homework Problems* (10% each for a total of 50%):**
All homework is due at the beginning of class in hardcopy. Homework that is turned in late is subject receiving a maximum grade no higher than the lowest mark received on assignments turned in on time.

***Location Science Problem Formulation* (25%)**

- First Formulation Presentation
- Second Formulation Presentation

All students must be present at both formulation presentations to receive credit for this portion

***Participation* (25%):**
Students are expected to attend all the class periods. In-class participation is important not only to the individual student, but also to the class as a whole.

Expectations for Participation:

- Students prepare for and actively engage in class discussions (e.g., demonstrate active listening, not distracted by electronics or peers)
- Students thoughtfully engage in in-class assignments and activities

- Students participate in class discussion by:
    - raising informed discussion points;
    - connecting discussion to reading material, news, and relevant experiences;
    - asking questions;
    - listening to other perspectives;
    - sharing the floor with others.

GMU Email Accounts & Blackboard:
You must use and regularly check your GMU email account and Blackboard to receive information for this class. Please do not send emails from non-GMU accounts, they will be ignored. I will normally respond within 24 hours.

Honor Code:
You are expected to follow the George Mason University rules of student conduct as noted in the catalog.

Office of Disability Services:
If you require academic accommodations due to a permanent or temporary disability, please contact the Office of Disability Services (ODS) at (703)993-2474, http://ods.gmu.edu. ODS will then contact me to arrange appropriate accommodations.

Classroom Expectations and other Miscellaneous:
Students are expected to be on time for class.

1. In the event of any class cancellation, including changes in the pandemic situation, inclement weather (e.g. snow), the class will resume where we left off, adjustments, if necessary, will be made later.
2. Please turn cell phone sounds off and do not text or talk on your cell phone during class.
3. Please be respectful of your peers and your instructor and do not engage in activities that are unrelated to the class. Such disruptions show a lack of professionalism and may affect your participation grade.
4. Lecture materials will be posted on Blackboard within 24 hours after the lecture. If you feel note taking is necessary, research has shown that pen and paper is the most effective.