GGS675 - LOCATION SCIENCE - SYLLABUS

Course Information

Course number: GGS675
Course title: Location Science
Term: Fall 2016
Class Meetings: Exploratory Hall 2310; Thursday 7:20pm –10:00pm
Class Web Page: mymason.gmu.edu

Professor Contact Information

Professor: Kevin M. Curtin, PhD
Email: curtin@gmu.edu
Office: Exploratory Hall 1454
Office Hours: Fridays 2pm – 4pm (08/29/2016 – 12/16/2016)
Office Phone: (703) 993-4243
Home Page: http://locationscience.gmu.edu/People/Curtin/Curtin.html

Course Description

This course presents the theory and practice of Location Science – the study of the optimal or near optimal spatial location and allocation of facilities, routes, personnel, or other assets. A variety of optimal procedures for location problems is presented, including minimum spanning tree, shortest path, maximal flow, and transportation problem algorithms. The Simplex method as applied to location problems is outlined and demonstrated. Heuristic approaches to location problems including greedy heuristics and Tabu search heuristics are reviewed. The peer-reviewed literature in location science is explored.

Required Textbook

None. Selected readings from textbooks and peer-reviewed journal articles will be assigned.
Recommended Textbook: Hillier and Lieberman – Introduction to Operations Research

Grading Policy

Assignments (5)	100 points each	500
Class Participation (1)	50 points	50
First Formulation Presentation (1)	75 points	75
Second Formulation Presentation (1)	125 points	125
Final Exam (1)	250 points	250
Total Possible Points:		1000 points

Course & Instructor Policies

Extra Credit: There may be a few take home exercises for extra credit.

Late Assignments: Assignments are due by the start of the class period on the due date. Late assignments are accepted up to 4 days late. Each day incurs a 10 point penalty. **There are no exceptions to this policy.**

Attendance: Attendance is expected and required

Academic Integrity: Students are expected to follow the GMU Honor Code

All academic accommodations regarding disabilities must be arranged through the **Office of Disability Resources** (703-993-2474)

DATE	TOPICS	ASSIGNS
09/01/16 Lecture 1	Intro to Location Science Hotelling Model - Network Optimization Minimum Spanning Tree / Dijkstra's Algorithm	
09/08/16 Lecture 2	Second Dijkstra Example; Math Programming More Network Optimization Classic Transportation Problem Network Simplex Method	
09/15/16 Lecture 3	Second Network Simplex Problem More Network Optimization - Flow on Networks Finding a Formulation to Present	Assignment 1 Due
09/22/16 Lecture 4	Third Network Simplex Problem First Maximal Flow Problem Shortest Path in Raster World	
09/29/16 Lecture 5	Second Max Flow Problem Formulation Presentation Discussions Third Max Flow – Reverse Arcs Advances in Location Science	Assignment 2 Due
10/06/16 Lecture 6	Planar Space - 1-Median (Weber Problem) Weiszfeld Algorithm P-Median - Combinatorial Complexity Redux	
10/13/16 Lecture 7	The P-Median and the Maranzana Heuristic Tietz and Bart Center Problems; Solving the 2-Center Problem on a Tree	
10/20/16 Lecture 8	**First Formulation Presentations**	Assignment 3 Due
10/27/16 Lecture 9	No Class	
11/03/16 Lecture 10	Linear Programming Graphical Solution Procedure The Simplex Method I – Friendly Examples	
11/10/16 Lecture 11	The Simplex Method II Adaptations to the Simplex Method Complications with the Simplex Method	
11/17/16 Lecture 12	LP Solving Tools	Assignment 4 Due
11/24/16	**THANKSGIVING RECESS – NO CLASS**	
12/01/16 Lecture 13	Heuristics for Location Science Basics of interchange heuristics Exam Review	
12/08/12 Lecture 14	**Final Presentations** How can you use Location Science? Formulation appreciated	Assignment 5 Due
12/16/16	**FINAL EXAM**	

These descriptions and dates are subject to change at the discretion of the professor.