Geography 5100
Location Analysis

Syllabus – Fall 2019

Course Information and Requirements

Course Title: GEOG 5100 – Location Analysis
Credits: 3
Instructor: Eric Hoffman

email: **eric.hoffman**@uconn.edu
(After the first day of classes, registered students should use HuskyCT's Messages tool to send correspondence to the instructor.)

Office Hours: Questions and concerns at any time via email.

Recommended Text:

Students should have a copy of ***Mastering ArcGIS 8th Edition*** by Maribeth Price (**Publisher:** McGraw-Hill Higher Education (**ISBN:** 978-1-259-92965-6). An eBook version of the text is available from the publisher. Visit create.mheducation.com/shop/ and search for ISBN: 978130728918 (title: Applications of GIS). This text will greatly assist anyone who does not have a foundational knowledge of ArcGIS software in particular ArcMap.

All other readings will be made available in HuskyCT.

Additional Information:
The developer of this course is Dr. Robert G. Cromley, Professor of Geography at the University of Connecticut. All images, charts, graphs were created by Dr. Robert G. Cromley unless otherwise cited.

Excluding materials for purchase, syllabus information may be subject to change. The most up-to-date syllabus is located within the course in HuskyCT.

Course Description

Geography 5100 is a course covering issues and approaches in location analysis. Topics include location theory and models; representation issues; use of geographic information systems (GIS) for data preparation, analysis and display; evaluation of service areas; land use allocation; accessibility and locational conflict; and implications for planning and public policy.

Course Goals and Objectives

Upon successful completion of this course, you will be able to:

- Explain location theories.
- Develop real world location/allocation models.
- Examine the impact of scale and representation on model outcomes.
- Solve real world location/allocation problems using computerized optimization techniques.
- Evaluate the impacts of locational choices, including resulting political conflicts.
- Use GIS operations to estimate model parameters, display and evaluate model results.

Course Requirements and Grading

The final course grade will be based upon the following required components

Course Components	Final Grade %
Assignments	40 %
Midterm Exam	25 %
Final Exam	35 %
Total	**100** %

Assignments:

You may freely communicate with other students in the course regarding any assignment. For each assignment, a discussion board has been created for this purpose. However, you must complete each assignment without copying material from another student or anyone else. The grading of assignments will be based on the proper submittal of all required deliverables described in the exercise. Each assignment has its own point value noted below.

Assignment Name	Number of Points
Assignment 1: Modeling Demand and Market Areas	20
Assignment 2: From Entropy Maximizing to Distance Minimizing	30
Assignment 3: Solving the Weber Model as a Suitability Problem	20
Assignment 4: Solving the Location set Covering Problem	25
Assignment 5: Solving the LSCP Using LCCUs	25
Assignment 6: Solving the Maximal Capture Problem	20
Assignment 7: Solving a Goal Programming Model	20
Total Points	160

Exams

All examinations are open-book and open-notes. However, you cannot communicate with any other person or persons in any fashion whatsoever while in the process of taking the examinations.

Final Letter Grades

Final letter grades for this course will be determined based on the following scale:

Grade	Letter Grade	GPA
97 – 100	A+	4.3
93 – 96.9	A	4.0
90 – 92.9	A-	3.7
87 – 89.9	B+	3.3
83 – 86.9	B	3.0
80 – 82.9	B-	2.7
77 – 79.9	C+	2.3
73 – 76.9	C	2
70 – 72.9	C-	1.7
67 – 69.9	D+	1.3
63 – 66.9	D	1.0
60 – 62.9	D-	0.7
< 60	F	0.0

Due Dates and Late Policy
All course due dates are identified in the Course Schedule in HuskyCT. Deadlines are based on Eastern Standard Time; if you are in a different time zone, please adjust your submittal times accordingly.

Assignments handed in late will be penalized by a 10% deduction, unless you have contacted the instructor and made special arrangements. One week after the due date, an assignment will not be accepted for credit, unless you have contacted the instructor and made special arrangements.

If you will miss an exam due to illness or other extraordinary circumstance, you must contact the instructor in advance of the exam time to schedule a make-up.

Feedback and Grades
I will make every effort to provide feedback and grades in a timely manner. All assignment will be graded within 3 days of their due date. The midterm and final exam will be graded within 2 days. To keep track of your performance in the course, use the MyGrades tool in HuskyCT.

Course Outline

Session 1: Introduction to Location Theory and Optimization Methods

- History of Location Theory;
- Modeling the Landscape for Location-Allocation Analysis and Market Area Analysis;
- Solving Location-Allocation Problems: Optimization Methods

Session 2: Spatial Interaction and Spatial Allocation Models

- Market Area Analysis
- Spatial Interaction Modeling: The Gravity and Maximum Entropy Modeling
- The Transportation Problem & Its Dual Problem
- Central Place and Threshold Constraints

Session 3: Land Use Allocation and Plant Location

- The Von Thunen Model; Urban Land Use
- Land Use Suitability; Linear Programming Approaches to Land Use Suitability
- Plant Location, Market Potential, and the Least Cost Weber Model

Session 4: Public Facility Location

- Public Facility Location Theory; Measures of Central Tendency & Locational Equity versus Efficiency
- The Location Set-Covering Problem; The Maximal Covering Problem
- The p-Median Problem
- Solutional Heuristics and Interrelationships Between Facility Location Models

Session 5: Representation and Scale Issues

- Representation Issues
- Aggregation Effects in Location-Allocation Modeling
- Integrating GIS Operations into the Location-Allocation Process

Session 6: Competition

- Spatial Interdependence
- The Maximal Capture and the Preemptive Location Problem
- Risk/Return, Uncertainty and Game Theory
- Facility Interdiction Models

Session 7: Multi-objective Location Modeling, Noxious Facilities, & SDSS

- Goal Programming and Criterion Weighting
- Locational Conflict and Noxious Facilities
- Spatial Decision Support Systems

Couse Schedule

Dates	Topic	Activity	Due Date
Session 1 Aug 26 – Sept 9	Modeling Demand and Market Areas	Assignment 1	Sept 9
Session 2 Sept 10 – Sept 23	From Entropy Maximizing to Distance Minimizing	Assignment 2	Sept 23
Session 3 Sept 24 – Oct 7	Solving the Weber Model as a Suitability Problem	Assignment 3	Oct 7
Session 4 Oct 8 – Oct 21	Solving the Location set Covering Problem	Assignment 4	Oct 21
EXAM Oct 22 – Oct 28	Midterm Exam		Oct 28
Session 5 Oct 29 – Nov 11	Solving the LSCP using the LCCUs	Assignment 5	Nov 11
Session 6 Nov 12 – Nov 18	Solving the maximal capture problem	Assignment 6	Nov 25
Thanksgiving Break			
Session 7 Nov 26 – Dec 7	Solving a Goal Programming Model	Assignment 7	Dec 7
EXAM Dec 8 – Dec 16	Final Exam	Final Exam	Dec 16

All assignments and activities are due at noon (EST) on the specified day.

Software Requirements

The technical requirements for this course include:

- Reliable, high-speed internet access
- ArcGIS Desktop 10.x
    - ArcGIS is available to enrolled students via UConn SkyBox or UConn AnyWare, or you can request a download code from the instructor to install the software on your PC. ArcGIS is a MS Windows based program, therefore student computers must have a Windows OS if they want to install ArcGIS Desktop on their PC.
- Microsoft Excel 2000 or later version
- Word processing software
- Adobe Acrobat Reader

Minimum Technical Skills

To be successful in this course, you will need the following technical skills:

- Use email with attachments.
- Use a basic spreadsheet program, such as Excel.
- Use ArcGIS 10.x.
- Save files in commonly used word processing program formats.
- Copy and paste text, graphics or hyperlinks.
- Use presentation software to create and share information.
- Work within two or more browser windows simultaneously.
- Open and access PDF files.

University students are expected to demonstrate competency in Computer Technology. Explore the Computer Technology Competencies page for more information.

Student Responsibilities and Resources

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important standards, policies and resources, which include:

- The Student Code
- Academic Integrity
- Resources on Avoiding Cheating and Plagiarism
- Academic Support Resources
- Copyrighted Materials
- Netiquette and Communication
- Adding or Dropping a Course
- Academic Calendar
- Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships
- Sexual Assault Reporting Policy

Students with Disabilities
Students needing special accommodations should work with the University's Center for Students with Disabilities (CSD). You may contact CSD by calling (860) 486-2020 or by emailing csd@uconn.edu. If your request for accommodation is approved, CSD will send an accommodation letter directly to your instructor(s) so that special arrangements can be made. (Note: Student requests for accommodation must be filed each semester.)

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government." (Retrieved March 24, 2013 from Blackboard's website)

Course Evaluation

Students will be provided an opportunity to evaluate instruction in this course using the University's standard procedures, which are administered by the Office of Institutional Research and Effectiveness (OIRE).

Additional informal formative surveys may also be administered within the course as an optional evaluation tool.

Help

The UConn eCampus FAQ page provides a guide to technical and academic assistance.

This course is completely facilitated online using the learning management platform, HuskyCT. If you have difficulty accessing HuskyCT, you have access to the in person/live person support options available during regular business hours through HuskyTech. You also have 24x7 Course Support including access to live chat, phone, and support documents.