

Syllabus

GEOG 5100 Location Analysis

Course Information and Requirements

Course Title: GEOG5100 Location Analysis

Credits: 3

Prerequisites: None

Format: Online via [HuskyCT](#) (HuskyCT Help: [Digital Learning Center](#), 860-486-1187)

Instructor: Natalia Vorotyntseva

E-mail: Natalia.Vorotyntseva@uconn.edu (After the first day of classes, students registered in the course should use HuskyCT's Messages tool to send correspondence to the instructor.)

Office: 423 B, Philip E. Austin Building (formerly CLAS)

Office Hours: By appointment via [Skype](#), natalia.vorotyntseva1.

Required Text: Students should have a copy of Price, *Mastering ArcGIS*, 5th edition. All other readings will be made available in HuskyCT via the Library Resources Tool.

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.

Course Description

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 Objectives

At the completion of this course, you should 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	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7

77-79	C+	2.3
73-76	C	2.0
70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	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.

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

Required Software

- ArcGIS 10 (*This software is free to enrolled students. Instructor will email instructions on downloading software prior to the start of class.*)
- Microsoft Excel 2000 or later version

Minimum Technical Skills

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

- Use electronic mail with attachments.
- Use basic spreadsheet programs, such as Excel.
- Use ArcGIS 10.
- 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.

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. This section provides a brief overview to important standards, policies and resources.

Student Code

You are responsible for acting in accordance with the [University of Connecticut's Student Code](#), available at http://www.community.uconn.edu/student_code.html. Review and become familiar with these expectations. In particular, make sure you have read the section that applies to you on Academic Integrity:

- [Academic Integrity in Undergraduate Education and Research](#)
- [Academic Integrity in Graduate Education and Research](#)

Cheating and plagiarism are taken very seriously at the University of Connecticut. As a student, it is your responsibility to avoid plagiarism. If you need more information, use the following resources:

- [Plagiarism: How to Recognize it and How to Avoid It](#)
- [Instructional Module about Plagiarism](#)
- [University of Connecticut Libraries' Student Instruction](#) (includes research, citing and writing resources)

Netiquette and Communication

At all times, course communication with fellow students and the instructor are to be professional and courteous. It is expected that you proof read all your written communication, including discussion posts, assignment submissions, and mail messages. If you are new to online learning or need a netiquette refresher, please look at this guide titled, [The Core Rules of Netiquette](#).

Adding or Dropping a Course

If you should decide to add or drop a course, there are official procedures to follow:

- Matriculated students should add or drop a course through [Peoplesoft](#).
- Non-degree students should refer to the Registrar's office [Non-Degree page](#) for more information.

You must officially drop a course to avoid receiving an "F" on your permanent transcript. Simply discontinuing class or informing the instructor you want to drop does not constitute an official drop of the course. For more information, refer to the:

- [Undergraduate Catalog](#)
- [Graduate Catalog](#)

Academic Calendar

The University's [Academic Calendar](#) contains important semester dates.

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.)

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](#).