

Syllabus – Spring 2019

Course and Instructor Information

Course Title: GIS in Transportation Geography (GEOG 5130)

Credits: 3

Format: online

Professor: Weixing Zhang

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Phone: (860) 617-0998

Office Hours/Availability: By appointment

Office Location: 270 Middle Turnpike Unit 5202
Storrs, CT 06269

Prerequisites: GEOG 5500: Fundamentals of GIScience

Minimum Technical Skills:

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

- Familiarity with ArcGIS 10 and higher.

- Familiarity with Microsoft Excel

- Knowledge of electronic mail with attachments

- Saving files in commonly used word processing program formats
- Copying and pasting text, graphics or hyperlinks

- Using presentation software to create and share information

- Working within two or more browser windows simultaneously

- Opening and accessing PDF files

Course Materials

Required Materials:

Geography of Transportation

By E. J Taaffe, H. L. Gauthier, and M. E. O 'Kelly

2nd edition, Published 1996. Publisher: Prentice Hall, Upper Saddle River,
ISBN: 0-13-368572-1

A PDF of this textbook is available for free, with a recommended donation of \$5 to the Ned Taaffe Memorial Fund at Ohio State University. After downloading the textbook, please visit the [Ned Taaffe Memorial Fund page](#) to make a donation.

Additional course readings and media will be available through HuskyCT.

The developer of this course is Dr. Jeffrey Osleeb, Professor in the Department of Geography at the University of Connecticut. All videos, images, charts, graphs not created by the instructor are used with permission of the publisher or are in the public domain and cited under Fair Use practices.

Course Description

This course introduces the major concepts pertaining to the subject of the urban transportation design and management using geospatial technologies. The content of this class is aimed to teach the students about transportation systems, specifically how they function and which role they play for the space-economy and the policies regulating and promoting transportation development. A special attention is given to the formulation and use of transportation models, visualization and analysis of transportation systems within GIS environment.

Course Objectives

After completing this course you will be able to:

Demonstrate knowledge of transportation systems: how they function, their importance to the space –economy and the policies that regulate and promote transportation.

Formulate and employ transportation models.

Visualize and analyze transportation systems using GIS tools.

Course Requirements and Grading

The grade for the course will be based on the evaluation the student receives for completing each of the following required components:

Summary of Course Grading:		Grading Scale:		
Course Components	Final Grade %	Grade	Letter Grade	GPA
10 Assignments	40	93-100	A	4.0
Midterm Examination	30	90-92	A-	3.7
Final Problem	30	87-89	B+	3.3
TOTAL	100	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

Activities

Assignments are designed to connect the content areas associated with readings and lectures to different geographic methods, forms of spatial analysis, and GIS techniques. You will also be asked to reflect on several major issues affecting transportation systems and economic development. In doing so, you will interpret spatial patterns and trends within and between regions and transport analysis zones in order to gain a better appreciation of transportation geography.

It is expected that this active learning approach to the modeling and study of transportation systems through the use of Geographical Information Science will enhance the student's analytical skill set and be a preparation for the job market.

Assignments

Ten assignments are associated with the 13 sessions that make up this course. The step-by-step instructions for the ten assignments are found at the end of a session. These 10 assignments require ArcGIS 10.1 or later as well as Microsoft Excel. In some cases the student will be asked to download data from the web. In other cases data for the assignment will be provided.

Examinations

There will be a midterm examination. The midterm examination has both a hands-on component as well as a written component. This test will consist of essay questions as well as problems that will have to be solved.

Final Problem

For the final problem the student will be given several data sets related to a specific transportation problem. The data will be analyzed with ArcGIS and the student is asked to write a final report describing the analysis undertaken and the conclusions reached.

Academic Misconduct

All exercises, quizzes, and examinations are open-book and open-notes. However, except for the exercises, you cannot communicate with any other person or persons in any fashion whatsoever while in the process of taking the quizzes or examinations. I expect everyone to follow this code of conduct. In the unfortunate event where someone is found in violation of this policy, it will be handled according to the Student Code of the University (see below), which may be found on the website of the Division of Student Affairs. Pay special attention to *Appendix A: Academic Integrity* in Undergraduate Education and Research. If you have any questions, please check with me. Academic dishonesty of any type will not be tolerated in this class. Students should refer to the Student Code (see section on Academic Integrity - http://www.dos.uconn.edu/student_code.html) for specific guidelines.

Accessibility Issues

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the [Center for Students with Disabilities](#) (860-486-2020) as soon as possible to better ensure that such accommodations are implemented in a timely fashion.

Course Outline (and Calendar if Applicable)

This course will be conducted totally online in 13 sessions. Each session is expected to take one week to complete including the accompanying assignment where applicable. Each session will include a lecture and accompanying readings. **Please refer to the course calendar (available on HuskyCT) for a list of assignment and exam due dates.**

Session 1 – Introduction to Transportation Geography Session 01 Module 01 Spatial Organization Session 01 Module 02 Transportation Linkages <i>Assignment 1: Regionalization</i> Session 2 – Geographic Information Systems Session 02 Module 01 Geographic Approach Session 02 Module 02 TIGER Session 02 Module 03 Types of GIS Session 02 Module 04 GIS Data <i>Assignment 2: Using GTFS Files</i> Session 3 – Spatial Models Session 03 Module 01 Highway Capacity Models Session 03 Module 02 Other Uses of GIS Session 03 Module 03 Spatial Decision Support System Session 03 Module 04 Using Vector SDSS to Design a Bus Systems <i>Assignment 3: Calculating Vulnerable Populations</i> Session 4 –Transportation Geography Fundamentals Session 04 Module 01 Networks Session 04 Module 02 Conditions for Movement Session 04 Module 03 Transport Pricing	MIDTERM Examination Session 9 – Allocation Models II: Advanced Topics in Allocation Modeling Session 9 Module 01 The Transshipment Problem Session 9 Module 02 The Commodity Logistics System (COLS) Session 9 Module 03 Data Requirements for the Commodity Logistics System Session 9 Module 04 Commodity Logistics System Results Session 9 Module 05 Commodity Logistics System Model Session 9 Module 06 The COLS Model Session 9 Module 07 The Interperiod Network Storage Location Allocation (INSLA) Model Session 9 Module 08 Biofuels Distribution Session 9 Module 09 The INSLA Model Session 9 Module 10 INSLA Results Session 10 – Transportation Options Session 10 Module 01 Urban Transportation Options Session 10 Module 02 The Problem Session 11 – Location, Land Use and
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<p>Session 04 Module 04 Intermodalism <i>Assignment 4: Network Deviousness</i></p> <p>Session 5 –Transportation Geography II Session 05 Module 01 Transport Rates Session 05 Module 02 Transportation Costs and the Location of Economic Activities Session 05 Module 03 Trade <i>Assignment 5: Network Density</i></p> <p>Session 6 –Transportation Geography and Spatial Analysis Session 06 Module 01 More about Networks Session 06 Module 02 Accessibility <i>Assignment 6: Calculating Network Accessibility</i></p> <p>Session 7 – Advanced Network Analysis Session 07 Module 01 Shortest Path Problem <i>Assignment 7: Calculating The Shortest Path</i></p> <p>Session 8 – Allocation Models Session 08 Module 01 The Transportation Problem Introduction Session 08 Module 02 The Initial Feasible Solution Using the Northwest Corner Rule Session 08 Module 03 The Dual Variables Session 08 Module 04 Opportunity Cost Session 08 Module 05 The Rule for The Reallocation of Flow Session 08 Module 06 Additional Iterations <i>Assignment 8: The Transportation Problem</i></p>	<p>Transportation Interaction Session 11 Module 01 Regional Implications of Transit Stations to the Residential Rental Market Session 11 Module 02 Characteristics of Transit Riders A Comparison of Washington Metro and Atlanta MARTA Session 11 Module 03 The Role of Politics in Economic Decision-Making A Case Study of the East Aurora Expressway <i>Assignment 9: Transportation and Land Use</i></p> <p>Session 12 – The Urban Transportation Planning System Session 12 Module 01 Urban Transportation Planning System Session 12 Module 02 Trip Generation Session 12 Module 03 The Urban Land Use Model Session 12 Module 04 Other Models of Urban Land Use Session 12 Module 05 The Herbert-Stevens Residential Model</p> <p>Session 13 – The Urban Transportation Planning System Session 13 Module 01 Trip Generation II Session 13 Module 02 The Gravity Model Session 13 Module 03 Trip Distribution Session 13 Module 04 Modal Split <i>Assignment 10: Trip Generation</i></p> <p><i>Final Problem: High School Bus Routing Problem</i></p>
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Due Dates and Late Policy

All course due dates are identified on the course calendar. Deadlines are based on Eastern Standard Time; if you are in a different time zone, please adjust your submittal times accordingly. *The instructor reserves the right to change dates accordingly as the semester progresses. All changes will be communicated in an appropriate manner.*

Feedback and Grades

I will make every effort to provide feedback and grades within one week of their due date. To keep track of your performance in the course, refer to My Grades in HuskyCT.

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](#). 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 about the subject of plagiarism, 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)

Copyright

Copyrighted materials within the course are only for the use of students enrolled in the course for purposes associated with this course and may not be retained or further disseminated.

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 proofread 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 the [Student Administration System](#).
- Non-degree students should refer to [Non-Degree Add/Drop Information](#) located on the registrar's website.

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.

Academic Support Resources

[Technology and Academic Help](#) provides a guide to technical and academic assistance.

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

<http://www.blackboard.com/platforms/learn/resources/accessibility.aspx>)

Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships

The University is committed to maintaining an environment free of discrimination or discriminatory harassment directed toward any person or group within its community – students, employees, or visitors. Academic and professional excellence can flourish only when each member of our community is assured an atmosphere of mutual respect. All members of the University community are responsible for the maintenance of an academic and work environment in which people are free to learn and work without fear of discrimination or discriminatory harassment. In addition, inappropriate Romantic relationships can undermine the University’s mission when those in positions of authority abuse or appear to abuse their authority. To that end, and in accordance with federal and state law, the University prohibits discrimination and discriminatory harassment, as well as inappropriate

Romantic relationships, and such behavior will be met with appropriate disciplinary action, up to and including dismissal from the university. More information is available at <http://policy.uconn.edu/?p=2884>. _

Sexual Assault Reporting Policy

To protect the campus community, all non-confidential University employees (including faculty) are required to report assaults they witness or are told about to the [Office of Diversity & Equity](#) under the [Sexual Assault Response Policy](#). The University takes all reports with the utmost seriousness. Please be aware that while the information you provide will remain private, it will not be confidential and will be shared with University officials who can help. More information is available at <http://sexualviolence.uconn.edu/>. _