California State University San Marcos
CHABSS – Economics Department
ECON 321 Introduction to Spatial Analysis in Economics
Spring 2023

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Lecture Modality: Traditional (in-person)
Class Meetings: Monday 9:30am – 12:20pm in SBSB 1108G
Office Hours: Before/after class, Thursdays 12:00-1:00pm (in person), virtually by appointment.

Course Description
Geographic Information Systems (GIS) are tools for managing data about where features are (geographic coordinate data) and what they are like (attribute data), and for providing the ability to query, manipulate, and analyze those data. Because GIS allows one to represent social and environmental data as a map, it has become an important analysis tool used across a variety of fields including: planning, architecture, engineering, public health, environmental science, economics, epidemiology, and business. GIS is a powerful tool, and this course is meant to introduce students to the basics of spatial analysis. Because this is an economics course, we will focus on the use of GIS and spatial analysis techniques as they apply to economic topics and research. The course will use spatial analysis and modeling to emphasize how spatial information strengthens traditional economic models and decision-making processes. Case applications and laboratory assignments reinforce these topics.

Course Objective
The fundamental objective of this course is to introduce the theories and applications of Geographic Information Systems (GIS) and spatial analysis in an economic context. Some basic topics include topological data structure, retail site location and planning, service area delineation, environmental equity, urban transportation and crime analysis, accessibility analysis, and the design and implementation of GIS applications. Over the course of the semester, students will be exposed to various economic topics, datasets, research literature, and laboratory assignments that will teach them the following terminology and techniques in the ArcGIS Pro software:

-Basic navigation tools in GIS
-Geodatabases, shapefiles, and formats
-Vector vs. Raster
-Creating and managing a GIS project
-Querying and working with tables
-Adding information to the attribute table
-Map design and presentation
-Selecting features (by location or attribute)
-Joining data and working with parcel data
-Geocoding process and datasets
-Querying GIS data
-Statistical summaries
-Census and socio-economic data for an area
-Calculating new variables and making new fields
-Geoprocessing Tools
-Spatial Analyst Tools
-Testing for spatial autocorrelation
-Network analyst tools
-Site Suitability Analysis
-Decision making using GIS

Background Preparation (Prerequisites)
ECON 201 and ECON 202. *MATH 242 is recommended, but not required*.

Economics Department Student Learning Outcomes
1. Define, describe, interpret and apply the choice calculus of different economic entities (individuals, firms, groups, government).
2. Describe, explain and employ the economic way of thinking.
3. Explain and analyze how markets work.

4. Define, describe and employ the scientific method to answering economic questions
5. Explain and analyze how the economy works.
6. Apply the knowledge and methods in PSLOs 1-5 to formulate and answer economic questions.

Course Student Learning Outcomes

- ❖ Articulate the importance of spatial modeling in economics and the larger world around us.
- ❖ Analyze economic data with a spatial/geographic component.
- ❖ Develop creative solutions to spatial economic problems.
- ❖ Apply spatial modeling methods in a variety of economic and business world situations.
- ❖ Communicate spatial data through map projections.

Necessary Technical Competency Required for Students:

Ability to navigate Cougar Courses, use office applications such as Microsoft Word and PowerPoint, communicate in a discussion forum, view lecture materials and videos, complete lab assignments, do online quizzes, and download, save, and upload files.

Textbook and Materials

1) GIS Tutorial for ArcGIS Pro 2.8 By: Wilpen L Horr and Kristen S. Kurland. ESRI Press. ISBN: 9781589486805

2) A flash drive is recommended as the easiest way to store your assignments and final project and to be able to easily work on them from campus or at home.

Course Requirements

Homework Assignments	30%
Article Reports (2)	10%
Quizzes	20%
Proposal/Final Project	30%
Participation	10%

Grade Scale

This course uses the standard University +/- system.

93-100% = A	87-89% = B+	77-79% = C+	60-69% = D
90-92% = A-	83-86% = B	73-76% = C	Below 60% = F
	80-82% = B-	70-72% = C-	

Homework:

There will be six homework assignments during the semester. Each chapter has multiple tutorials followed by assignments. The tutorials prepare you for the assignments. I will only be collecting the assignment portions as graded homework. Assignments directions for the entire textbook are posted on Cougar Courses. You will typically submit assignments as either an attached Word document or on ArcGIS Online. Assignments not turned in by the assigned date will not be accepted.

Article Reports:

There will be two short article reports during the semester. These article reports require you to review an economic journal article of your choice that does not already have a GIS component and then discuss how the research may benefit from adding spatial analysis using GIS. The essay can be formed around the prompt: If you were going to continue work on this topic, how would you use GIS to assist your research? A short list of journal articles will be provided to get you started, but I

strongly suggest finding articles yourself on topics you are passionate about and/or selecting ones you think could benefit from incorporating spatial analysis. See the Article Report Guide on Cougar Courses for more details.

Quizzes:
There will be ten short weekly quizzes, which will cover the material presented in lectures, labs, and readings. The quizzes will consist of multiple choice and short response questions. No makeup quizzes will be offered. Please see the review guide posted on Cougar Courses to help you prepare.

Proposal and Final Project:
In the final course project, you will be required to select a research topic related to economics and apply your knowledge and skills developed over the course to perform spatial analysis and representative map displays. You will be required to formulate a question you would like to investigate, collect geographic coordinate data, and perform spatial analysis of the data using tools in the ArcGIS software. From here, you should interpret and reflect on your results. What did you learn from spatially analyzing the data? Was your main question answered? What are the implications of your results? How would you expand on your research? Were there any limitations or obstacles in your research? etc. To prevent procrastination, a project proposal including sources for data availability will be due well in advance of the final project presentations. The final project should include a short 3-5 page paper and a 5-10 minute presentation (using StoryMaps or PowerPoint). A more detailed outline of the proposal and project requirements are provided on Cougar Courses.

Participation:
Students are required to participate fully in all course meetings. This includes attendance, engaging in class discussions and/or forums, asking and answering questions and overall level of attentiveness. Please read/watch all assigned material prior to each class and be ready to discuss/analyze them. I expect everyone to actively contribute to the class discussions. Your attendance and classroom engagement will be recorded at each class and used to determine your participation score. Also, please arrive on time. When you arrive late it is distracting for your fellow students and me. Repeat tardiness and/or absences will result in a lower participation grade.

Course Policies:
Credit Hours and Writing Requirement
Under the University Credit Hour Policy students are expected to spend a minimum of two hours plus an hour of lecture each week for each unit of credit engaged in learning. This means for a 3 unit course you should expect to spend approximately 6 hours outside of lecture time to complete the required readings, assignments, material comprehension, and test preparation. In total, you can expect to spend 9 hours or more per week on this course to be successful in passing the class. to succeed in the course. The university writing requirement will be met by the homework, exam questions, essay, and Urban Photo project papers.

Academic Honesty and Integrity
Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Students are expected to maintain the highest level of academic honesty and integrity. Cheating and plagiarism will not be tolerated. If a student is caught cheating or plagiarizing on an exam or assignment he/she will receive a zero for that assignment and will be subject to consequences related to academic misconduct. In accordance with the general rules and regulations of the university, disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole. Academic dishonesty cases will be

referred to the Dean of Students Office and may result in suspension or expulsion from CSU San Marcos and the CSU System.

Accommodations for Students with Disabilities

Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disability Support (DSS). This office is located in Craven Hall 4200, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Email inquiries can be sent to dss@csusm.edu. Students authorized by DSS to receive reasonable accommodations should meet with me during my office hours in order to ensure confidentiality.

Non-Academic Support Resources

For more information on the following resources that are available to all students please see the Student Resources page on Cougar Courses:

- Student Outreach and Referral (SOAR) & Cougar Care Network (CCN)
- Student Health and Counseling Services
- Cougar Pantry
- University Police
- Career Center

Contact Information for Technical Support Assistance

For questions or assistance with a technical part of the course, your campus username/password, your campus email, Cougar Courses, etc., please contact the CSUSM Student Technology Help Desk. Email inquires can be sent to sth@csusm.edu.

Tentative Course Schedule

Week	Start Date	Topic	Assignments
1	8/28	Introduction & Getting Started Basics Ch.1 Introducing ArcGIS	Create ArcGIS account
2	9/4	Ch.1 Introducing ArcGIS	HW#1: Ch.1
3	9/11	Ch.2 Map Design	
4	9/18	Ch.2 Map Design	HW#2: Ch.2
5	9/25	Ch.4 File Geodatabases	
6	10/2	Ch.4 File Geodatabases	HW#3: Ch.4
7	10/9	Ch.6 Geoprocessing	Article Report #1
8	10/16	Ch.6 Geoprocessing & Ch.8 Geocoding	HW#4: Ch.6
9	10/23	Ch.9 Spatial Analysis	HW#5: Ch.9 Project Proposal
10	10/30	Ch.10 Raster GIS	HW#6: Ch.10 Work on project
11	11/6	ArcGIS Online	Article Report #2 Work on project
12	11/13	Ch.5 Spatial Data	Work on project
13	11/20	Ch.3 Map Outputs for GIS Projects (Story Maps)	Work on project
14	11/27	Project Meetings	Finishing projects
15	12/4	**Final Project Presentations**	Paper & Presentations Due
16	12/11	All done – focus on other finals 😊	Relax!