**Course Instructor**

- **Geography**: Talen, Emily
- **Geography**: Marynia
- **Geography**: Clark, Terry N.
- **Geography**: Kolak, Luc
- **Geography**: Anselin, Luc
- **Geography**: Credit, Kevin
- **Economics**: Schwan, Mary

**Course Description**

- **Introduction to Location Analysis**: This course introduces students to a wide array of geospatial technologies and techniques in order to explain the basic theory and application of geographic information systems (GIS). To do this, students will use open source or free software such as QGIS and Google Earth Pro to complete GIS lab exercises that cover a range of topics, including an introduction to different types of geospatial data, geographic measurement, GIS principles of cartography, remote sensing, basic GIS mapping and analysis techniques, remote sensing, and specific geospatial applications such as 3D modeling and geodesign. By providing a general overview of geospatial technologies, this course provides students with a broad foundational knowledge of the field of Geoscience that prepares them for more specialized concepts and applications covered in future GIS courses.

- **Geographic Information Science I**: This course covers several foundational concepts in economic geography and urban planning, such as bid-rent theory, locational equilibria, various models of urban structure and growth, urban market areas, transportation, economic restructuring, and the "back-to-the-city" movement. This course incorporates several GIS exercises to teach students the basic principles of location optimization and to help illuminate the foundational theoretical principles of economic geography.

- **Introduction to Spatial Data Science**: Spatial data science consists of a collection of concepts and methods drawn from both statistics and computer science that deal with accessing, manipulating, visualizing, exploring, and reasoning about geographical data. The course introduces the types of spatial data relevant in social science inquiry and reviews a range of methods to explore these data. Topics covered include formal spatial data structure, geovisualization and visual analytics, rate smoothing, spatial autocorrelation, cluster detection, and spatial data mining. An important aspect of the course is to learn and apply open source software tools, including R and GeoDa. Pre/Req: STAD 2200 (or equivalent). Familiarity with GIS is helpful, but not necessary.

- **Urban Policy Analysis**: This course addresses the explanations available for varying patterns of policies that cities provide in terms of expenditures and service delivery. Topics include theoretical approaches and policy options, migration as a policy option, group theory, urban preference theory, incrementalism, economic base influences, and an integrated model. Also examined are the New York fiscal crisis and taxpayer revolts, measuring citizen preferences, service delivery, and productivity.

- **Introduction to Urban Sciences**: This course is a broad overview of conceptual frameworks, general phenomena, emerging data and policy applications that define a growing scientific, integrated understanding of cities and urbanization. It starts with a general outline of current worldwide explosive urbanization and associated changes in social, economic and environmental indicators. It then introduces a number of historical models, from sociology, economics and geography that have been proposed to understand how cities operate. We will discuss how these and other facets of cities can be integrated as dynamical complex systems and derive their general characteristics as social networks embedded in structured physical spaces. Resulting general properties of cities will be illustrated in different geographic and historical contexts, including an understanding of urban resource flows, emergent institutions and the division of labor and knowledge as drivers of innovation and economic growth.

- **Cities By Design**: The course examines the theory and practice of city design—how, throughout history, people have sought to mold and shape cities in pre-determined ways. The form of the city is the result of myriad factors, but in this course we will hone in on the purposeful act of designing cities according to normative thinking—ideas about how cities ought to be. Using examples from all time periods and places around the globe, we will examine how cities have been purposefully designed and what impact those designs have had. Where and when was city design begun, and how successful has it been in more harm than good?

- **Urban Design with Nature**: This course will use the Chicago region as a laboratory for evaluating the social, environmental, and economic effects of alternative forms of human settlement. Students will be introduced to the basics of geographic information systems (GIS) and use GIS to map Chicago's "place types"—human habitats that vary along an urban-to-rural transect, as well as the ecosystem services provided by the types. They will then evaluate these place types using a range of social, economic and environmental criteria. In this way, students will evaluate the region's potential to simultaneously realize economic potential, protect environmental health, and provide social connectivity. This course is part of the College Course Cluster program: Urban Design. Prerequisites: Third or fourth-year standing.

- **Readings in Spatial Analysis**: This independent reading option is an opportunity to explore special topics in the exploration, visualization and statistical modeling of geospatial data. It is open to graduate students interested in Geographic Information Sciences (GIS). Students and instructors can arrange a Reading/Research course when the material being studied goes beyond the scope of a particular course, when students are working on material not covered in an existing course, or when students would like to receive academic credit for independent research. Subject, course of study, and requirements must be arranged with the instructor.