URP 520: GEOGRAPHIC INORMATION SYSTEMS

Fall 2023
Tuesday and Thursday, 4:00p – 5:00p / 2104 A&B Taubman Art and Architecture Building
Instructor: Lecturer Tony Bedogne, GISP (bedognea@umich.edu; abedogne@a2gov.org)

This course provides an introduction to the theory and application of geographic information systems (GIS) technology, with particular emphasis on application to urban planning problems. The emphasis is on learning fundamental principles and concepts and gaining broad exposure to GIS applications such as assessing spatial relationships between people and places, and in policy and planning settings involving community development, land use, infrastructure, and environmental planning. Topics include spatial analysis techniques, the evolution of the current theories behind GIS technology, hardware and software requirements, spatial data types, data forms and sources, map and report production, and fundamentals of database design.

Students will learn through a variety practical business examples of GIS implementation. Weekly lab exercises will enforce software and processing skills. The course will culminate in a data integration project where student groups will use mapping technologies to convey a research goal or idea spatially.

Learning Goals:

By the end of the term, students will be able to:

- Create and manipulate raster and vector data within GIS to visualize urban phenomena
- Create maps which conform to accepted cartographic standards to ensure clear communication
- Design and conduct analysis which use GIS functionality to answer spatial questions
- Recognize data and table structures into a relational model
- Perform dataset conversions including projection and formatting
- Create posters and dynamic (online) map presentations of spatial display
- Visualize data distributions using graphs, histograms, colors, symbols, and annotation
- Combine spatial data using techniques such as clip, intersect, union, identity, join, buffer, merge, zonal statistics, geocoding, and aggregate
- Apply GIS to a real-world question or problem by completing a GIS mapping integration project

Course Requirements:

Course assignments (labs) introduced and completed weekly, students are expected to engage in coursework and labs outside of class. This course requires a thorough understanding of the Windows operating system; file storage and internet proficiency, also including elementary database design. Students are expected bring their individualized discipline knowledge into the class sessions; including but not limited to the "fact finding" of localized information, statistics, business trends, environmental factors, development patterns, or demographics. A final mapping project will be presented in the form of a poster and a dynamic web mapping application. There are map reading exercises which rwquire students to orient themselves using coordinates on printed media. The course also will contain two examinations.