UP 6700 & GPH 3600
Introduction to Geographic Information Systems

Winter Term 2021
Urban Studies & Planning
Wayne State University

Lecturer:

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Office hours by appointment

Introduction:

Geographic Information Systems or GIS is a computerized tool used to capture, manage, analyze and display geographically referenced data. It allows you to identify and understand geographic patterns, distributions, and relationships in your data. The system consists of computer hardware, software, data, and methods. The course will focus on GIS data input, management, analysis, and output of geographic data. You will learn GIS terms, concepts and applications and how to use a GIS software application.

There will be class lectures and GIS application demonstrations. Lectures will introduce GIS terms, concepts and applications. Software demonstrations will introduce students to the Esri ArcGIS Pro application, and how to use core tools for geographic analysis and mapping.

Lectures and demonstrations will be conducted online each Wednesday. We will start class at 6 pm. Students are expected to be online to participate.

Prerequisites:

Students are required to have a Windows computer for the class. You will need to install the ArcGIS Pro application on it. You will be provided with a trial copy. It is a Windows program, and it will not operate on a Mac OS. You will use ArcGIS Pro to complete assigned tutorials and a class project. Access to a university computer through VMware will not be available.

No previous experience using a GIS application is required.

Learning Outcomes:

The course will introduce students to GIS. There are three key learning outcomes:

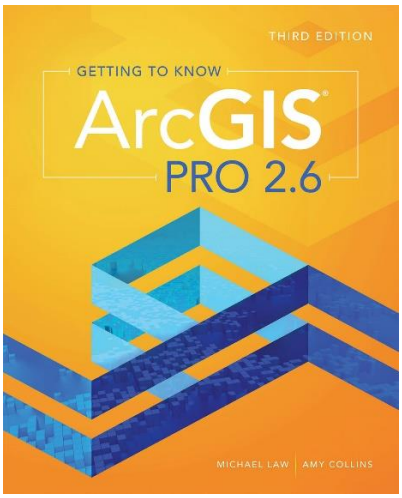
1. Students will recognize and understand GIS terms, concepts and methods.
2. Students will understand core GIS tools used to analyze geographic data.
3. Students will be able to apply basic tools from the Esri ArcGIS Pro application to analyze geographic data and create maps.

Lectures will introduce terms, concepts and applications. Workbook assignments, ArcGIS Pro software demonstrations and a GIS course project will teach you the tools and skills.

Required Text:

Getting to Know ArcGIS Pro 2.6, third edition, Michael Law, Amy Collins,

ISBN: 9781589486355, Esri Press, 2020, 420 pages



Grading:

Grades are based on the following:

	Grading	Percent (%)
(1)	Test 1 (Lectures 1 - 4)	25
(2)	Test 2 (Lectures 5 - 8)	25
(3)	Chapters 1 - 5: "Getting to Know ArcGIS Pro" Questions	10
(4)	Chapters 6 - 10: "Getting to Know ArcGIS Pro" Questions	10
(5)	Location Analysis Project Paper	30

Academic Dishonesty:

(edited statement from the DOSO's web site)

All forms of academic misbehavior are prohibited at Wayne State University, as outlined in the Student Code of Conduct. Students who commit or assist in committing dishonest acts are subject to downgrading (to a failing grade for the test, paper, or other course-related activity in question, or for the entire course) and/or additional sanctions as described in the Student Code of Conduct.

- Cheating:Intentionally using or attempting to use, or intentionally providing or attempting to provide, unauthorized materials, information or assistance in any academic exercise. Examples include: (a) copying from another student's test paper; (b) allowing another student to copy from a test paper; (c) using unauthorized material such as a "cheat sheet" during an exam.
- Fabrication:Intentional and unauthorized falsification of any information or citation. Examples include: (a) citation of information not taken from the source indicated; (b) listing sources in a bibliography not used in a research paper.
- Plagiarism:To take and use another's words or ideas as one's own. Examples include: (a) failure to use appropriate referencing when using the words or ideas of other persons; (b) altering the language, paraphrasing, omitting, rearranging,or forming new combinations of words in an attempt to make the thoughts of another appear as your own.
- Unauthorized reuse of work product: submission for academic credit, without the prior permission of the instructor, of substantial work previously submitted for credit in another course.Example: submitting a paper in a current course that was written for, and submitted in, a previous course.
- Other forms of academic misbehavior include, but are not limited to: (a) unauthorized use of resources, or any attempt to limit another student's access to educational resources, or any attempt to alter equipment so as to lead to an incorrect answer for subsequent users; (b) enlisting the assistance of a substitute in the taking of examinations; (c) violating course rules as defined in the course syllabus or other written information provided to the student; (d) selling, buying or stealing all or part of an un-administered test or answers to the test; (e) changing or altering a grade on a test or other academic grade records

Student Disabilities Services:

(edited statement from the SDS web site)

If you have a documented disability that requires accommodations, you will need to register with Student Disability Services(SDS) for coordination of your academic accommodations. The SDS office is located in the Adamany Undergraduate Library. The SDS telephone number is 313-577-1851 or 313-577-3365 (TTD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours or at another agreed upon time to discuss your needs.

Students who are registered with Student Disability Services and who are eligible for alternate testing accommodations such as extended test time and/or a distraction-reduced environment should present the required test permit to the professor at least one week in advance of the exam. Federal law requires that a student registered with SDS is entitled to the reasonable accommodations specified in the student's accommodation letter, which might include allowing the student to take the final exam on a day different than the rest of the class.

Schedule:

Week 1 – January 13:

Course Introduction

Lecture 1: GIS Overview
GIS Overview
Data Input
Data Storage and Management
Data Manipulation and Analysis
Data Output
Elements of a GIS

Introducing ArcGIS Pro

Week 2 – January 20:

Lecture 2: Data Models & Map Scale
Map Layers
Attribute Tables
Map Scale
Vector and Raster Data Models
Topology

ArcGIS Pro Demonstration

Week 3 – January 27:

Lecture 3: Georeferenced Data & Map Projections
Georeferencing Systems
Address Geocoding
Latitude and Longitude
Geographic Quadrants
Map Projections

ArcGIS Pro Demonstration

Week 4 – February 3:

Lecture 4: Data Input
Acquiring GIS Data
Data Quality Factors
Medadata
Categorizing Maps
Digitizing Maps

ArcGIS Pro Demonstration

Week 5 – February 10:

Test 1 - Lectures 1 through 4

Online Office Hours

Week 6 – February 17:

Lecture 5: Data Management
Geodata
Data Storage Options
Individual File Types
Accessing Data Online

ArcGIS Pro Demonstration

Week 7 – February 24:

Lecture 6: Spatial Analysis Overview
GIS Analysis Overview
Defining your Analysis
Multiple Step Analysis
Proximity Analysis
Overlay Analysis

ArcGIS Pro Demonstration

Week 8 – March 3:

ArcGIS Pro Demonstration

Week 9 – March 10:

ArcGIS Pro Demonstration

Week 10 – March 17:

No class meeting - Holiday

Week 11 – March 24:

Lecture 7: Overlay & Proximity Analysis
Point, Line and Polygon Overlay
Intersect and Union
Silver Polygons
Buffering Features
Dissolve Features

ArcGIS Pro Demonstration

Week 12 – April 7:

Lecture 8: Cartography
Creating Maps
Labels, Symbols and Colors
Basic Map Principles
Cartographic Elements
Map Design

ArcGIS Pro Demonstration

Week 13 – April 14:

Online Office Hours

Week 14 - April 21

Online Office Hours

Week 15 - April 28

Test 2 - Lectures 5 through 8