UP 6830 & GPH 4600
Advance GIS

Fall Term 2016
223 State Hall
Urban Studies & Planning
Wayne State University

Instructor:

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Course Objective:

Advance Geographic Information Systems is a laboratory-intensive course designed to prepare students with practical GIS experience and advance their knowledge with this technology. Each student will develop a project based on a topic of interest. The project's aim, data, method and results will be open to the student. Through the help of the instructor, students will define, create and complete a project that is both manageable and realistic for the term. The instructor will guide students along in helping them complete all phases of their project.

The course provides a good opportunity to apply GIS in solving practical geographic problems in the student's field of expertise. The instructor will guide students along with their projects. Class meetings will consist of instructor led demonstrations and working on GIS projects.

Course Content:

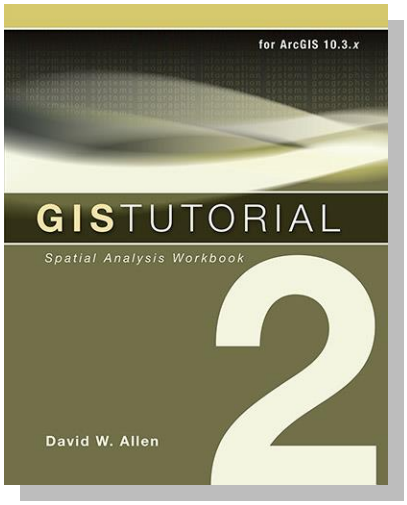
The course will address the process of constructing a small-scale GIS project. It will examine the methodologies available to plan, execute and manage a project, and the tasks involved to complete it. Topics will include:

- Defining the project's purpose and scope
- Identifying data sources
- Database development and design
- Application development and design
- Project findings and results

Learning Outcomes:

- Understand steps required to create a GIS project
- Learn how to use advance GIS tools
- Recognize and apply appropriate methodologies
- Identify and solve technical issues associated with a GIS project

Required Text:



GIS Tutorial 2: Spatial Analysis Workbook, 10.3 edition
David W. Allen, ISBN: 9781589484535, 2016, 418 pages

You will have to go online to download the data needed to go through the tutorials in the book. Use the following URL to access the data:
http://esripress.esri.com/bookResources/index.cfm?event=catalog.book&id=19

Classroom Computers:

You will need to logon to the computers in this lab to access the server. Please keep a backup copy of your data on this server. Your login will be your access ID and password.

Attendance:

If you cannot attend a class meeting, notify the instructor and not the Department of Urban Studies & Planning prior to your absence. It is understood that there will be times when the student will not be able to attend class.

Grading:

Grades are based on the assignments listed below. All inquires about your grade must be directed to the instructor and not the Department of Urban Studies and Planning.

Grading	**Percent (%)**
Textbook Questions One	20
Textbook Questions Two	20
Project Scope Paper	10
Final Project Work (ArcMap Document & Geodatabase)	15
Project Document Paper	30
Project Presentation	5

Student Ethics:

Academic Dishonesty (plagiarism, cheating, writing services, improper citations, etc.) is not permitted. Work submitted is assumed to be of the student. If any form of Academic Dishonesty is discovered by the instructor, the student will receive a failing grade for this class.

Student Disability Services:

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 Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

Schedule:

Note: *The schedule is subject to change at the instructor's discretion.*

Week 1 – September 1:

Course Introduction
Demonstration One:

- ArcMap, ArcCatalog & ArcToolBox
- Data Frame & Layer Properties
- Data & Layout Views
- File & Personal Geodatabases
- Data Extract Tools
- ArcGIS Pro

Week 2 – September 8:

Demonstration Two:

- Geodatabases
- Tables – queries, editing, calculating field values, summaries, hyperlinks, joins & relates

Week 3 – September 15:

Demonstration Three:

- Label Classes
- Label Expressions
- Annotation
- Scale References

Lab Exercises:
Ch 1 – Mapping where things are

Week 4 – September 22:

Demonstration Four:
- Georeferencing
- Digitizing
- Calculate Geometry
- Service Areas

Lab Exercises:
Ch 2 – Mapping the most and least

Week 5 – September 29:

No class meeting

Week 6 – October 6:

Due: Project Scope Paper - printed typed copy due at the start of class

Demonstration Five:
- Analysis Tools – map overlays, proximity & summarizing data

Lab Exercises:
Ch 3 – Mapping density

Week 7 – October 13:

Demonstration Six:
- Network Analysis – routes, service areas, closest facility, vehicle routing & location-allocation

Lab Exercises:
Ch 4 – Finding what's inside

Week 8 – October 20:

Demonstration Seven:
- Spatial Statistics
- Density
- Raster Proximity & Map Overlays

Due: Tutorial Questions One (Chapters 1-4)

Week 9 – October 27:

Demonstration Eight:
- Raster Analysis
- Hydrology – fill, basin, flow direction & watersheds
- Surface – aspect, slope, contours & observer points

Lab Exercises:
Ch 5 – Finding what's nearby

Week 10 – November 3:

Demonstration Nine:
- Analysis Tools Review

Lab Exercises:
Ch 6 – Mapping change

Week 11 – November 10:

Demonstration Ten:
- ArcMap Document Management – Data Frame & Layer Properties

Lab Exercises:
Ch 7 – Measuring geographic distribution

Week 12 – November 17:

Work on GIS projects

Lab Exercises:
Ch 8 – Analyzing patterns

Week 13 – November 24:

No class meeting – Thanksgiving Break

Week 14 – December 1:

Work on finalizing GIS projects

Lab Exercises:
Ch 9 – Identifying clusters

Week 15 – December 8:

Due: Tutorial Questions Two (Chapters 5-9)
Due: Final GIS project work – upload your final GIS project document paper, Geodatabase and ArcMap document (*.MXD) to the server.

GIS project presentations (approximately 10 minutes per student)

Week 16 – December 15:

No class meeting