Course Staff and Schedule

Instructor: Prof. Robert Goodspeed (rgoodspe at umich.edu)
Office: 2223C Art & Architecture Building
Office Hours: M& W 1:30 – 2:30 PM

GSI: Erin Royals (eroyals at umich.edu)

Lectures: M&W 12-1PM, Room 2108, Art & Architecture Building
Labs:
- 004 Th 4 – 6:30 PM – Windows Training Room 1
- 002 F 8:30 – 11 AM – Windows Training Room 3
- 003 F 1 – 3:30 PM – Windows Training Room 3

All labs held in the Duderstadt Center

Summary and Learning Objectives

This course is designed to introduce students to the dynamic field of geographic information systems (GIS). This course has three interrelated objectives: (1) provide a foundation in concepts from cartography, spatial analysis, and computer science used in GIS applications in planning, (2) develop specific skills using ESRI's ArcMap through a set of hands-on exercises, and (3) allow students to apply these skills through a mapping project on a topic of their choosing. Although urban planning topics will be emphasized, the course is intended to serve as a general introduction to GIS.

Through this course, students will learn the basic principles of GIS, how to frame spatial questions, and how to answer these question using GIS functions, including project and overlay map data, query and conduct spatial analysis, geocoding, and develop simple models using raster (grid) data.

Note on Labs: Students should enroll in one of the three lab sessions, which will meet in the Windows Training Rooms located on the second floor of the Duderstadt Center. If for some reason a student cannot attend their own session, please ask the GSI to assign you to another session for that week.

Materials

Textbooks
- Law, Michael and Amy Collins. 2013. Getting to know ArcGIS for Desktop. 3rd ed. Redlands, Calif.: ESRI Press. Available at the North Campus Bookstore. It is important to purchase this textbook new, since it is revised for the newest version of ArcGIS and comes with a software and data CD.
- DeMers, Michael N. 2005. Fundamentals of geographic information systems. 3rd ed. Hoboken, NJ: John Wiley. Available at the North Campus Bookstore or search online for inexpensive used copies. There is a newer (and more expensive) edition available.

Additional Texts (Available on reserve at the Art, Architecture & Engineering Library)
- Maantay, Juliana, and John Ziegler. 2006. GIS for the urban environment. Redlands, Calif.: ESRI Press. Textbook with useful cases on environmental, health, crime, and other planning topics.
• Monmonier, Mark S. 1996. *How to lie with maps*. 2nd ed. Chicago: University of Chicago Press. *Assigned chapters are posted to CTools, however the entire book is recommended to interested students.*


**Other**

• USB Drive, minimum 2 GB

• See course CTools website for links to a variety of journals, websites, and other GIS resources.

**Assignments**

• Class Participation and Discussion (5%)
• Lab Assignments (35%)
• Midterm Exam (15%)
• Module 2 & 3 Reading Response Posts (15%)
• Final Project Paragraph (5%), Proposal (5%), Poster and Presentation (20%)

**Labs** - Lab assignments are due at the beginning of the lab session the following week. The course content is cumulative and there are many assignments, so it is particularly important for students to keep up with the pace of the course. Late labs will be penalized 10% for each day late.

**Midterm** – The midterm is based on lecture presentations and readings. It will be a bluebook exam completed in-class.

**Module 2 & 3 Reading Response Posts** – After the midterm exam, students should post 200-500 word reading responses to the class website each week before the Monday lecture. These responses should address the second reading assignments for these weeks, which describe GIS applications. **Responses are due for a minimum of 4 of the 6 weeks, Week 13 (Thanksgiving) is excluded.** The grade is the percent of required posts completed.

**Final Project** – Additional details on the final project will be provided separately. A short paragraph is due at the start of class on Oct. 28, and a project proposal is due Nov. 11.

**Course Suggestions**

**Getting Help**

GIS is professional software, meaning it is used by a community of expert users who are already familiar with its interface, specialized functions, and underlying concepts. This makes it different than most of the software applications you have used before, which are designed for use by broad audiences of general users. **As a consequence, you may find GIS software to be buggy, confusing, and frustrating.** When you encounter problems, there are several resources available to you:

• Class Colleagues
• Class Website Forum
• Help files, FAQs, listservs, and other online resources
• Course instructors
• SAND Lab

Corrupted files, error messages, missing menus, and other challenges you may encounter are not problems, but learning opportunities along the path of becoming a professional GIS user.

**Academic Integrity**

Taubman College Policy on Plagiarism:
"Plagiarism is knowingly presenting another person’s ideas, findings, images or written work as one's own by copying or reproducing without acknowledgement of the source. It is intellectual theft that violates basic academic standards. In order to uphold an equal evaluation for all work submitted, cases of plagiarism will be reviewed by the individual faculty member and/or the Program Chair. Punitive measures will range from failure of an assignment to expulsion from the University."

Students will be provided guidance in class about academic integrity norms in GIS, including how to cite data sources and document analyses. Students with additional questions should contact the course instructor.

Students with Disabilities
It is Taubman College policy to "meet the educational needs of all persons, including those with physical or perceptual limitations, who are interested in the study of architecture, urban planning and/or urban design." Students with disabilities should contact the instructor as soon as possible in the semester.

Schedule

Module 1: Introduction to GIS

Week 1 - Introduction and Course Overview
Wed., Sept. 4: Introduction
Lab: GTK 3
Readings:
   1. Demers, Ch. 1

Week 2 - Geographic Concepts
Mon., Sept. 9: Concepts 1
Wed., Sept. 11: Concepts 2
Lab: GTK 6
Readings:
   1. Demers, Ch. 2 and 3
   2. Monmonier, Ch. 2

Week 3 - Spatial Data Formats
Mon., Sept. 16: Overview and Vector Data
Wed., Sept. 18: Raster Data
Lab: GTK 4
Reading:
   1. Demers, Ch. 4
Week 4 - Thematic Mapping, Symbology & Cartography

Mon., Sept. 23: Thematic Mapping
Wed., Sept. 25: Symbology & Cartography
Lab: GTK 7 + 8

Readings:
1. Monmonier, Ch. 10 & 11.

Week 5 – U.S. Census

Mon., Sept. 30: U.S. Census 1
Wed., Oct. 2: U.S. Census 2

Lab: GTK 16

Reading:

Week 6

Mon., Oct. 7: Database Concepts & Data Sources

Lab: Census Assignment

Reading:
1. Review Demers, Chapter 4, section titled "Computer Database Structures for Managing Data" (pp. 79-85)

Additional Resources:

Week 7

Mon., Oct. 14: Fall Break (No Class)
Wed., Oct. 16: Midterm Exam
Module 2: Data Creation & Analysis in GIS

Week 8 – Creating Data

Mon., Oct. 21: Creating Data and Digitizing

Wed., Oct. 23: Geocoding

Lab: GTK 11+12

Reading:
1. Demers, Ch. 5

Week 9 – Spatial Analysis

Students are encouraged to attend the conference "Planners in a "Post Racial" Society (?) : New Challenges and Directions," held on Oct. 31 – Nov. 2.

Mon., Oct. 28: Spatial Analysis 1: Select, Dissolve, Clip
• Project Paragraph Due

Wed., Oct. 30: Spatial Analysis 2: Model Builder

Lab: GTK 17+18

Reading:
1. Demers, Ch. 7

Week 10 – Spatial Analysis, Cont’

Mon., Nov. 4: Spatial Analysis 2: Buffer & Overlay

Wed., Nov. 6: Guest Lecture – GIS Analysis Applications

Lab: GTK 19

Reading:
1. Demers, Ch. 9 + 12
2. Ackerson, Kristopher. "In the Right Place: Iowa City uses GIS to Site Affordable Housing." Planning, Marsh 2013: 33-35

Week 11: Introduction to Raster Analysis

Mon., Nov. 11: Raster Data Model & Map Algebra
• Project Proposal Due

Wed., Nov. 13: Raster Analysis & Modeling

Lab: GTK 20
Reading:

Module 3: Emerging Applications and Final Projects

Week 12: Web Mapping and Open Source GIS

Mon., Nov. 18: Open Source GIS & Web Mapping

Wed., Nov. 20: PPGIS, Volunteered Geographic Information, Crowdsourcing

Lab: Web Mapping Assignment

Readings:

Additional Resources:

Week 13: Project Work Session
This week we will meet in a computer lab for a short "desk crit" to see your work so far and answer any questions. Attendance on Monday and Wednesday is required and the location will be announced.

Mon., Nov. 25: Project Work Session (Location TBA)

Wed., Nov. 27: Project Work Session (Location TBA)

No Labs (Thanksgiving)

Week 14


Wed., Dec. 4: Presentations (Location TBA)

Reading:
Additional Resources:


**Week 15: Final Presentations**

Mon., Dec. 9: Presentations (Location TBA)

Wed., Dec 11: Presentations (Location TBA)

**Week 16: Final Presentations**

Wed., Dec 18, 1:30 pm - 3:30 pm, Final Exam Window: Presentations (Location TBA)