INTRODUCTION TO URBAN GEOGRAPHIC INFORMATION SYSTEMS
Urban Planning 945-791/591

Location/Day/Time:  
Lecture: SARUP Room 189, Wednesdays, 1:30  
Lab: SARUP Room 158, Wednesdays, 3:30

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Course Outline

Week 1  
(WHY GEOGRAPHIC INFORMATION SYSTEMS?)  
(Jan 28)  
Topics: Course overview  
Applications of the technology  
Overview of GIS at UWM  
Assignment for next week: TBA

Week 2  
(GIS ‘KILLER APPS’)  
(Sept 21)  
Topics: Recent projects completed on campus  
Guest speaker: TBA  
Assignment for next week: TBA
Week 3
(Feb 11)
WHAT IS A GEOGRAPHIC INFORMATION SYSTEM? (LAB 3)
Topics: Components of GIS Technology:
- Automated Mapping Technology
- Data Base Management Systems
- Land Records Information
- Topological Data Structures
- Spatial Analysis

The Digital Map:
- Map Features (points, lines, polygons)
- Attributes of Map Features
- Identifiers

Assignment for next week: Homework Assignment #1

Week 4
(Feb 18)
GIS DATA STRUCTURES (LAB 4)
Topics:
- Spatial Data vs. Attribute Data
- Raster Data vs. Vector Data
- Vector Data Structures:
  - Automated Mapping
  - Attribute Linkages
  - Topology

DUE: Homework Assignment #1 (Put in Dropbox)

Week 5
(Feb 25)
GIS DATA (LAB 5)
Topics:
- AGSL Tour: Tour of the American Geographical Society’s digital data library at the Golda Meir Library, third floor.
- Guest Speaker: Bill Shaw, Milwaukee County Land Information Officer

Week 6
(Mar 4)
STREET NETWORK FILES (LAB 6)
Topics:
- Topology (again!)
- Census and Street Segment Geography
- U.S. Census Bureau GBFs:
  - DIME Files
  - TIGER Files
- Other GBFs:
  - Locally-created
  - Commercially Available
- Uses of GBFs:
  - Mapping
  - Geocoding
    - Address Matching
    - Interpolation
    - Spatial Geocoding
  - Dynamic Segmentation
Week 7  
(Mar 11)  
**LAND RECORDS** 
(LAB 7)  
Topics: Land Parcels and the Cadastre:  
- Cadastral Maps  
- Public Land Survey System  
- Cadastral Records  
- Geoids, Datums, Projections, and Coordinates  
Map Accuracy:  
- Accuracy and Scale  
- Accuracy vs. Precision  
Survey Control:  
- Local Survey Networks  
- Geodetic Control Network  
Planimetric Maps:  
- Relief and Tilt  
- Orthophotos  
- Digital Orthophotos (DOP)  
- Global Positioning System (GPS)

Week 8  
(Mar 18)  
**SPRING BREAK**

Week 9  
(Mar 25)  
**SPATIAL ANALYSIS**  
(LAB 8)  
Topics: Geocoding  
- Buffering  
- Reclassification, Dissolving, and Merging  
- Polygon Processing  
Network Analysis  
Assignment for next week: Homework #2

Week 10  
(Apr 1)  
**SPATIAL ANALYSIS FOR PEDS & BIKES**  
(LAB 9)  
Topics: Demand analysis  
- Safety analysis  
- Prioritization  
- Rates (normalization)  
DUE: Homework #2 (Put in Dropbox)

Week 11  
(Apr 8)  
**MIDTERM REVIEW**  
(LAB 10)

Week 12  
(Apr 15)  
**MIDTERM EXAM**  
(NO LAB)
Week 13  
(Apr 22)  
GIS ACTIVITIES IN WISCONSIN  
(LAB 11)

Topics: Questions/Answers on the Midterm Exam Results  
Introduction to the Final Project  
GIS at the City of Milwaukee  
The Milwaukee County Automated Mapping and Land Information System  
GIS Activities in Wisconsin  
The Wisconsin Land Information System Program

Week 14  
(Apr 29)  
NO LECTURE  
(LAB PRESENTATIONS DURING LAB)

Week 15  
(May 6)  
PAPER PRESENTATIONS  
(Graduate students)  
(NO LAB)

Week 16  
(May 13)  
PAPER PRESENTATIONS  
(Graduate students)  
(NO LAB)

FINAL PAPER DUE:  MAY 13

COURSE GRADING:

Exercises (Credit)  
Homework Assignments (10%)  
Midterm Exam (10%)  
Laboratory Work (50%)  
Final Paper (30%)