

Geographic Information System II - SURE 382  
Summer, 2007 (3 Credit Hours)

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**PREREQUISITE COURSES/SPECIAL SKILLS: SURE 282**

<b>COURSE DESCRIPTION:</b>	This is a continuation of SURE 282 and covers a broad range of topics in GIS including digital mapping, photogrammetry, boundary surveys, public land survey system, digital data bases, sources of spatial data from federal government, GIS hardware and software, and application and implementation of GIS in local government.
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**COURSE OBJECTIVES:**

1. To familiarize students with concepts of digital mapping, boundary survey, and public land survey systems.
2. To familiarize students with sources of data from federal and other sources.
3. To familiarize students with GIS hardware, software, and applications and implementation of GIS in local government.

**COURSE OUTLINE**

- I. Introduction to photogrammetry
  - 1.1 Types of photographs
    - 1.1.1 Aerial Photographs
    - 1.1.2 Terrestrial Photographs
    - 1.1.3 Satellite Imagery
  - 1.2 Difference between Maps and Photographs
  - 1.3 Flying Height and Scale of Photographs
  - 1.4 Distortions in Photography
  - 1.5 Stereoscopic Viewing
  - 1.6 Stereoscopic Plotters (Analog and Digital)
  - 1.7 Softcopy Photogrammetry
  - 1.8 Orthophotography
  - 1.9 Difference between a map and an orthophoto
  - 1.10 Sources of Errors in Photogrammetry
  - 1.11 Specifications for mapping
  - 1.12 Concepts of Remote Sensing
  - 1.13 LIDAR principles and applications
  - 1.14 Mobile Mapping Systems

- II. Boundary Surveys
  - 2.1 Historical Perspectives
  - 2.2 Property descriptions by metes and bounds
  - 2.3 Property description by block and lot system
  - 2.4 Property description by coordinates
  - 2.5 Retracement surveys
  - 2.6 Registration of title
  - 2.7 Adverse possession
  - 2.8 Parcel based land information system
  
- III. Public Land Survey System
  - 3.1 Instructions for surveys of the public lands
  - 3.2 Initial point, baseline, principal meridian
  - 3.3 Designation of townships
  - 3.4 Subdivision of a quadrangle into townships
  - 3.5 Subdivision of townships into sections
  - 3.6 Subdivision of sections
  - 3.7 Marking corners, witness corners
  - 3.8 Accuracy of public land surveys
  
- IV. Geodetic and Cartographic data from Federal Government
  - 4.1 National Oceanic and Atmospheric Administration
  - 4.2 National Imaging and Mapping Agency
  - 4.3 U. S. Army Corps of Engineers
  - 4.4 Tennessee Valley Authority
  - 4.5 Department of Agriculture
  - 4.6 Department of Transportation
  - 4.7 Bureau of the Census
  - 4.8 State and local agencies
  - 4.9 Commercial organizations
  - 4.10 National Cartographic Information Center
  - 4.11 National Geodetic Information Center
  - 4.12 U. S. Geological Survey
  - 4.13 Environmental Data and Information Center
  - 4.14 EROS Data Center
  
- V. Data Base Concepts
  - 5.1 Graphic and Nongraphic Data and their relationship
  - 5.2 Data Management
  - 5.3 Graphic data storage
  - 5.4 Topology
  - 5.5 Data quality
  - 5.6 Data base development
  - 5.7 Data entry
  - 5.8 Data formats

- VI. Digital Data Bases
  - 6.1 Primary databases
  - 6.2 Thematic data
  - 6.3 Digital elevation data
  - 6.4 Data exchange standards
  
- VII. GIS Hardware and Software
  - 7.1 GIS hardware components
  - 7.2 GIS software types
  - 7.3 Graphic processing capabilities
  - 7.4 Database management system
  - 7.5 Basic cartographic and spatial analysis utilities
  - 7.6 Special application software
  
- VIII. System Configuration and Data Communication
  - 8.1 Local communication
  - 8.2 Wide area networks
  - 8.3 Computer system configuration
  - 8.4 Centralized vs. distributed systems
  
- IX. Applications of GIS in Local Governments
  - 9.1 Map Revision (Plat maps, land use maps)
  - 9.2 Zoning (recording zoning changes, enforcing zoning restrictions)
  - 9.3 Assessment and taxation
  - 9.4 Building inspections
  - 9.5 Public policy
  - 9.6 Licensing and permits
  - 9.7 Homeland Security and GIS
  
- X. Implementation of GIS in Local Government
  - 10.1 Objectives of GIS in local government
  - 10.2 Costs of GIS
  - 10.3 GIS needs assessment
  - 10.4 Implementation plan
  - 10.5 GIS procurement RFP
  - 10.6 Pilot project and phased implementation
  
- XI. Legal Issues
  - 11.1 The value of information
  - 11.2 Information industry
  - 11.3 Privacy
  - 11.4 Liability for GIS products/services

**EVALUATION:** 40% from exams  
60% from assignments  
100% TOTAL

**GRADING SCHEME:** 90 - 100 A-range  
80 - 89 B-range  
70 - 79 C-range  
60 - 69 D-range  
0 - 59 E-range

**OTHER CRITERIA:**

Please put answers into your own words when answering the questions at the end of each lesson or on the exams. In the past I have had students cut and paste whole sections of the notes for answers to the questions. That will not be accepted. Put the answers in your own words. I realize that there will be a lot of responses that will pretty much follow my words and that is OK provided that I feel you have gone through the effort of answering the question correctly.

It is critical that everyone keeps up to date during this course. The course runs from June 27 to August 8. This means that I have to submit my grades soon after the end of the class. This timetable will give us the opportunity to spread the lessons out over the entire 6 weeks and leave time for the 2 exams. The following schedule will be adhered to:

Date	Lessons to be Submitted
July 2	Lessons 1, 2
July 9	Lessons 3, 4, 5
July 16	Lessons 6, 7, 8
July 23	Lessons 9, 10, 11
July 30	Lessons 12, 13, 14
August 6	Lessons 15, 16

Late lessons will be assessed a penalty of 5% per day or fraction thereof. I do realize that summer is a time for vacations. Therefore, please let me know in advance if you will be gone for a period of time due to vacation.

All assignments can be found on the web page for this class. The address is:

<http://www.ferris.edu/faculty/burtchr/sure382.html>

If you have any questions during the course, please feel free to contact me. I look forward to working with each and every one of you.