

URP-6276

Internet Geographic Information Systems

Instructor:

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Prerequisite: URP6270 or by consent with Instructor

Required Textbook: Zhong-Ren Peng and Ming-Hsiang Tsou, 2003, *Internet GIS: Distributed Geographic Information Services for the Internet and Wireless Networks*, New York: John Wiley & Sons.

Course Overview

This course focuses on the emerging technology in geographic information systems (GIS): Internet GIS. Internet GIS is a network-centric GIS technology that uses the Internet and the World Wide Web as a primary means of providing access to the functionality (i.e., analysis tools, mapping capability) of GIS and to the spatial data and other data needed for various GIS applications. It provides users capability to work interactively with maps and conduct spatial analysis on the Web. It has many applications in urban planning, e-government and e-business.

There are two goals of the course. The first one is to offer you theoretic background so that you will have a better understanding of the concepts of Internet GIS, such as how Internet GIS works, the different architecture models, and the state of art of the Internet GIS technology. The second goal is to offer you hands-on experience to use Internet GIS programs so that you can gain necessary skills to work with Internet GIS programs.

The course will start with an introduction to networking basics and the evolution of software architecture, specifically the client/server model. It will cover the basics of the Internet and the Web, as well as its communication protocol HTTP, followed by an introduction to Internet GIS, and the different architecture models of Internet GIS, from Web mapping to distributed geographic services. We'll also compare some Internet GIS programs developed by other GIS vendors.

The course will also cover the most recent development in Internet GIS, the geography markup language (GML) and Map Mashups, as well as their applications in GIS data encoding, transport and interoperability. We'll also cover mobile GIS, the use of mobile devices like personal digital assistant (PDA) and mobile phone to access GIS data and services.

The course will provide hands-on training in web design and the use of Internet GIS software. Specifically, we will cover the basic techniques in HTML, Microsoft Active Server Pages, Java script, and ArcGIS Server. You can have other software choices such as MapGuide and Geomedia Web Map.

The cornerstone product of this course is the final project. In addition to the final project report, the students are required to design an Internet GIS application in a professional Web site that incorporates the concepts and techniques covered in this course. The Web site should include at least the following elements: static HTML, HTML forms, interactive map interface, dynamic elements using Active Server Pages, and a use of one of the Internet GIS programs such as ArcGIS Server, MapGuide and Geomedia Web Map. Group projects are allowed with permission from the instructor, but no more than two students in one group. Group projects will be judged at a higher standard than an individual project.

The final grade will be consisted of the following:

- 15 percent from assignments, class attendance and active class participations.
- 35 percent from the midterm exam, and
- 50 percent from the final project, including project demo, presentation and final report.

The grading of the final project depends on the functionality, originality, complexity, and the user-friendliness of the Internet GIS Web site, the quality of writing and presentation.

Students with Disabilities

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

Class Attendance

Students are expected to attend all classes and labs and to stay until the class/lab period ends. Role will be taken daily; more than 3 unexcused absences will result in the loss of a letter grade. In the case of illness or a family emergency, a schedule for the completion of make-up work must be determined with the instructor as soon as possible upon a student's return to class. Failure to comply with the agreed upon schedule will result in a failing grade for that project.

Academic Honesty

Students in the Department of Urban and Regional Planning are expected to adhere to all University of Florida academic honesty policies. Failure to do so will result in lowered grades and/or referral to the Dean of the Students Office at the University. The following are some examples that are considered to be academic dishonesty:

- copying graphics or texts from any sources for your report without crediting the original source,
- representing someone else's work as your own,

- allowing someone else to represent your work as his/her own,
- Multiple submissions of the same or similar work without prior approval,
- Falsifying information such as changing or leaving out data; manipulating or misreporting statistics for a research project; altering work after it has been submitted; hiding reference materials, etc.

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Fall 2010

General Course Outline

Week	Contents	Readings
1 (8/24)	Course Overview and Introduction 1. Evolution of GIS technology 2. What is Internet GIS? 3. Introduction to Internet GIS and Mobile GIS 4. Introduction to Google Earth, Virtual Earth and World Wind 5. Lab: Exploring Internet GIS sites	Chapter 1
2 (8/31)	Networking Fundamentals of Internet GIS 1. How does the computer networking work 2. Open Systems Interconnection (OSI) reference model Lab: Web Design and HTML	Chapter 2
3 (9/7)	Networking Fundamentals of Internet GIS 3. Physical communication mechanisms 4. Local area networks 5. Wide area networks Lab: Web Design and Advanced HTML Assignment #1 Due	Chapter 2
4. (9/14)	Client/Server Computing and Distributed Component Frameworks 1. Client/server Concepts 2. Client/Server Architecture Models 3. Distributed Component Frameworks 4. A Dynamic Architecture for Distributed GIServices Lab: Introduction to ArcGIS Server Assignment #2 due	Chapter 3
5 (9/21)	ArcGIS Server 1. Introduction to ArcGIS Server 2. ArcGIS Server architecture Lab: ArcGIS Server	Chapter 8.1-8.2
6 (9/28)	The Evolution of Internet GIS: Web Mapping 1. The Development History of Distributed GIS 2. Organizations and Standards 3. Static Web Mapping 4. Interactive Web Mapping Lab: ArcGIS Server	Chapter 4
7 (10/5)	Distributed GIS 1. Architecture Models of Distributed GIS 2. Components and function Requirements for A Single-site Distributed GIS	Chapter 5

	3. Enterprise Distributed GIS 4. LEGO-like Dynamic GIServices Architecture 5. System Implementation of Distributed GIS Assignment #3 Due Lab: ArcIMS	
8 (10/12)	XML and GML Applications 1. What is metadata? 2. What is XML? 3. XML Applications 4. Geography Markup Language Lab: ArcXML	Chapter 7
9 (10/19)	Map Mashups 1. What is Map Mashup? 2. How does it work? 3. Applications of Map Mashups Lab: Sample applications of Map Mashups	
10 (10/26)	Midterm Exam	
11 (11/2)	Active Serve Pages (Readings to be assigned at the class) Lab: Active Server Pages Assignment #4 due	
12 (11/9)	Mobile GIS 1. The Business Case of Mobile GIS 2. General System Architecture of Mobile GIS 3. Samples of Mobile GIS Software Packages 4. Applications of Mobile GIS 5. The Future of Mobile GIS on WAP and PDA Lab: Assignment #5 Due	Chapter 9
13 (11/16)	Hands-on ArcServer Lab Lab: Relational Database (Access and ArcSDE) Assignment #6 Due	
14 (11/23)	Standard Development 1. Standards of Internet GIS from OGC 2. Standards from ISO 3. Metadata standard Lab: Student Presentation: Project design framework	Chapter 6
15 (11/30)	Quality of Service and Security Issues <ul style="list-style-type: none"> • Performance • Security • Scalability • Interoperability Lab: Project work hours	Chapter 10.
16 (12/7)	Internet GIS Applications Lab: Project work hours	Chapters 12-13
17 (12/14)	Final Project Presentation Project report due	

