URP 6278: Web Mapping and Visualization

3 credits

INSTRUCTOR:

Daniel Downing, Assistant Scholar, GeoPlan Center

OFFICE HOURS: TBD

COURSE WEBSITE:

http://elearning.ufl.edu

COURSE COMMUNICATION:

All communication with course faculty will take place within Canvas. All emails will be sent and received within Canvas. You should NOT be emailing the course instructor outside of the system. The instructor is also available for phone calls or live chat by appointment. Please contact the instructor by email to arrange a call or chat.

REQUIRED OR RECOMMENDED TEXTBOOKS AND READINGS

Fu, P. (2016). *Getting to Know Web GIS Second Edition*. Esri Press.
http://esripress.esri.com/display/index.cfm?fuseaction=display&websiteID=283

Readings:
Chakraborty, D., Sarkar, D., Agarwal, S., Dutta, D., & Sharma, J. (2015). Web Based GIS Application using Open Source Software for Sharing Geospatial Data. *International Journal Of Advanced Remote Sensing And GIS, 4*(1), pp. 1224-1228.

Sonam Agrawal, Dharmendra Kumar Meena, Gupta RD. (2015) Comprehensive review of GIS and web GIS. *Discovery*, *41*(189), 130-135.

Suzana Dragićevic. (2004). The Potential of Web-based GIS. *Journal of Geographical Systems. 6* (2), 79-81.

COURSE DESCRIPTION

In this course, students will learn how to utilize web mapping for communication and visualization of geographic data. Students will learn the fundamentals concepts of web GIS, web mapping formats, and spatial architecture. Students will also learn the technical skills necessary to symbolize data, create and publish maps on the web, and create web mashups. This course will utilize Esri web mapping platforms and introduce students to open source web mapping platforms.

PREREQUISITE KNOWLEDGE OR SKILLS

Satisfactory completion (B or higher) of URP 6270, Introduction to Planning Information Systems & Satisfactory completion (B or higher) of URP 6275, Intermediate Planning Information Systems

COURSE GOALS AND/OR OBJECTIVES

Upon successful completion of this course, students will be able to:
- Describe how to symbolize and share geographic data on the Web.
- Describe how to prepare data and software for web map optimization.
- Classify spatial web hardware and software architecture.
- Classify web service communication.
- Be able to design and create simple web maps and mashups.
- Be aware of the different open source and proprietary software options for creating and deploying maps on the web.
- Describe the basics of web mapping APIs and their capabilities.
- Describe the basics of mobile GIS for data collection and editing.

INSTRUCTIONAL METHODS

The concepts and techniques will be covered in lectures, videos, and hands-on class exercises. Students will practice the concepts learned in the materials through homework assignments and a final project. Student will learn and the concepts of spatial thinking and problem solving through course materials, and then apply and practice those concepts through homeworks and the final project, which utilize GIS software techniques.

COURSE POLICIES

ATTENDANCE POLICY

While face-to-face attendance is not required, students need to make use of the various tools in Canvas to develop a learning community. The discussion board is an area where students can communicate with the instructor and classmates regarding a variety of topics.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
http://gradcatalog.ufl.edu/content.php?catoid=8&navoid=1493#attendance

QUIZ & EXAM POLICIES

Quizzes and Exams will be given to test student knowledge on course material.

HOMEWORK ASSIGNMENT POLICY

Homework assignments and their due dates are specified in the course schedule. Homeworks are due on the last day of the week by 6pm, unless otherwise stated in the course schedule.

MAKE-UP POLICY

No late work will be accepted. Computer problems that arise during submission will not be accepted as an excuse for late work. All work must be completed and submitted by the designated time in Canvas or you will not receive credit for the assignment.

In the event that you have technical difficulties with e-Learning, please contact the UF Help Desk. If your technical difficulties will cause you to miss a due date, you MUST report the problem to Help Desk. Include the ticket number and an explanation of the issue based on consult with Help Desk in an e-mail to the instructor to explain the late assignment/exam. The course faculty reserves the right to accept or decline tickets from the UF Help Desk based on individual circumstances.

COURSE TECHNOLOGY

This course will be using ArcGIS Desktop. Students will need to acquire the latest version from the GeoPlan Center: http://geoplan.ufl.edu/software/software.shtml

COMPUTER REQUIREMENTS

Students will need a computer that meets or exceeds the specifications below.

Components	Specifications
CPU Speed	2.2 GHz minimum; Hyper-threading (HHT) or Multi-core recommended
Processor	Intel Pentium 4, Intel Core Duo, or Xeon Processors; SSE2 minimum
Memory/Ram	2 GB minimum
Display Properties	24 bit color depth
Screen Resolution	1024 x 768 recommended or higher at Normal size (96dpi)
Swap Space	Determined by the operating system, 500 MB minimum.
Disk Space	2.4 GB
Video/Graphics Adapter	64 MB RAM minimum, 256 MB RAM or higher recommended. NVIDIA, ATI, and Intel chipsets supported. 24-bit capable graphics accelerator OpenGL version 2.0 runtime minimum is required, and Shader Model 3.0 or higher is recommended. Be sure to use the latest available driver.
Networking Hardware	Simple TCP/IP, Network Card or Microsoft Loopback Adapter is required for the License Manager.
High Speed Internet Access	High speed internet access is highly recommended.

More information on supported platforms is available at:

http://desktop.arcgis.com/en/arcmap/10.3/get-started/system-requirements/arcgis-desktop-system-requirements.htm

UF POLICIES

SPECIAL ACCOMMODATIONS
Students requesting disability-related academic accommodations must first register with the Disability Resource Center (Links to an external site.).

The Disability Resource Center will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.

UNIVERSITY POLICIES
University policies on such matters as add/drop, incomplete, academic probation, termination of enrollment, reinstatement, and other expectations or procedures can be found in the graduate student handbook (Links to an external site.) and at the Dean of Students website (Links to an external site.).

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT
Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code (Links to an external site.).

STUDENT HONOR CODE
In adopting this Honor Code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the University community. Students who enroll at the University commit to holding themselves and their peers to the high standard of honor required by the Honor Code. Any individual who becomes aware of a violation of the Honor Code is bound by honor to take corrective action.

Student and faculty support are crucial to the success of the Honor Code. The quality of a University of Florida education is dependent upon the community acceptance and enforcement of the Honor Code (Links to an external site.).

> **The Honor Pledge:** We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code.

On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

STUDENT SUPPORT SERVICES
As a student in a distance learning course or program, you have access to the same student support services that on campus students have. For course content questions contact your instructor.

For any technical issues you encounter with your course please contact the UF computing Help Desk at 342-392-HELP (4357). For Help Desk hours visit: http://helpdesk.ufl.edu (Links to an external site.). For a list of additional student support services links and information please visit: http://www.distance.ufl.edu/student-services (Links to an external site.).

CLASS DEMEANOR OR NETIQUETTE
Course communication should be civilized and respectful to everyone. All members of the class are expected to follow rules of common courtesy in all e-mail messages, threaded discussions and chats. The means of communication provided to you through e-Learning (e-mail, discussion posts, course questions, and chats) are at your full disposal to use in a respectful manner. Abuse of this system and its tools through disruptive conduct, harassment, or overall disruption of course activity will not be tolerated. Conduct that is deemed to be in violation with University rules and regulations or the Code of Student Conduct will result in a report to the Dean of Students.

Refer to the Netiquette Guide for Online Courses (Links to an external site.) for more information.

GRADING POLICIES

COURSE GRADE

Grading Summary
Homework Assignments: 30% total
Quizzes: 20%
Mid-Term Exam - 20%
Final project - 30%

Grading Per Assignment

Assignment	Percent of Total Grade	Date Due
Homework 1	6%	End of Week 3
Homework 2	6%	End of Week 4
Homework 3	6%	End of Week 5
Homework 4	6%	End of Week 6
Homework 5	6%	End of Week 7
Quiz 1	10%	End of Week 1
Quiz 2	10%	End of Week 2
Mid-Term Exam	20%	End of Week 5
Final Project	30%	End of Week 8

GRADING SCHEME

Letter Grade	Percentage	Grade Points
A	93-100%	4.00
A-	90-92%	3.67
B+	88-89%	3.33
B	83-87%	3.00
B-	80-82%	2.67
C+	78-79%	2.33
C	73-77%	2.00
C-	70-72%	1.67
D+	68-69%	1.33
D	58-67%	1.00
D-	55-57%	0.67
E	Below 55%	0.00

For greater detail, see the Grades section of the [Graduate Catalog for the University of Florida (Links to an external site.)](#). It also contains the policies and procedures, course descriptions, colleges, departments, and program information for UF.

FINAL PROJECT DETAILS

The purpose of the Final Project is to synthesize course material (URP 6270, URP 6275) and utilize technical skills learned in those courses to design and complete a GIS project. In URP 6270, students learn the fundamentals of GIS and basic technical skills to utilize GIS software to manipulate and analyze geographic data. In URP 6275, students further their technical and analytical skills to address more complex spatial problems. In this course, students learn how to share, communicate, and display GIS project results via an interactive web map.

Satisfactory completion of the Final Project will demonstrate the student's knowledge and understanding of GIS fundamentals and spatial analysis, ability to find and vet GIS data suitable for decision making and analysis, technical proficiency in using GIS software, and communication and visualization skills. Project results must be displayed in an interactive web map. The student must justify their choices of source data, spatial analyses, data storage formats, web service types, and API elements used, with respect to both aesthetics and performance. Students will present their material to the instructor and class.

COURSE SCHEDULE

CRITICAL DATES

Assignment	Date Due
Quiz 1	End of Week 1

Quiz 2	End of Week 2
Homework 1	End of Week 3
Homework 2	End of Week 4
Homework 3	End of Week 5
Mid-Term Exam	End of Week 5
Homework 4	End of Week 6
Homework 5	End of Week 7
Final Project	End of Week 8

WEEKLY SCHEDULE OF TOPICS AND ASSIGNMENTS

Module	Primary Topic	Topics Covered
1	**Web GIS Concepts**	- History of Web GIS - Web Services - OGC Web Services - Web Communication – Clients, Servers, Requests - GIS Servers - Quiz 1: Module 1
2	**Web Mapping Software and Publishing Basics**	- Common Web Mapping Software (Proprietary and Open Source) - Considerations for Choosing Software - Basics of Data Publishing: - Data preparation - Symbolization & styling - Optimization - Tiling and Caching - Creating simple web maps using online tools - Quiz 2: Module 2
3	**ArcGIS Online (AGOL) Part I**	- AGOL Basics - Web GIS layers, Maps, and Apps - Hosted Feature Layers - Homework 1: Map CSV data using geocoding. Create a shareable web map. Incorporate your web map into a Web Mapping Application.
4	**ArcGIS Online (AGOL) Part II**	- Story Maps - Web AppBuilder for ArcGIS - Homework 2: Using one of the free mapping platforms create a web map using available data. Create a map using your data. create a web map combining the two data sources.

5	ArcGIS Server	● ArcGIS Server Basics ● Additional ArcGIS Server Capabilities ● ArcGIS Server Services ● ArcGIS Server Management (Web Manager/Catalog) ● Homework 3: Find three sources of ArcGIS Server services. Write a one page summary of the advantages and disadvantages of hosting your own data with ArcGIS Server versus using a service like ArcGIS Online. ● Mid-Term Exam
6	Mobile GIS	● Data collection ● Collector for ArcGIS ● Survey 123 ● Homework 4: Create an editable map with AGOL and use collector to create points, lines, and polygons with detailed metadata.
7	Web Mapping Frameworks and APIs	● Popular Web Apps and Their Frameworks ● ArcGIS API for Javascript ● Google Maps API ● Homework 5: Compare/Contrast two popular web mapping applications.
8	Free and Open Source Software (FOSS)	● GeoServer ● Open GeoPortal ● Solr

Disclaimer: This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.