URP 6270: Introduction to Planning Information Systems

Note: This syllabus is subject to change. Any changes will be communicated in advance.

Course Description

Introduction to Planning Information Systems is intended to introduce students to the concepts, principles, and the reality of using Geographic Information Systems (GIS). It also teaches the essential skills of operating a functional GIS mainly through the use of ArcGIS software package. This powerful technology provides planners with a very effective tool for capture, analysis, and display of spatial data that is crucial to the planning process. The course is theoretical and practical (i.e., very hands-on), addressing both the structure of geographic information systems and the use of this tool within planning for spatial analysis and data management.

Course information

INSTRUCTOR: Dr. Yan Wang, Assistant Professor
E-Mail: yanw@ufl.edu, Office Phone: (352)-294-3376 (CAT), Office Room: ARCH 456
CLASS NUMBER: 23028; **SECTION:** 257C
CREDIT HOURS: 3 Credit Hours
COURSE MEETING TIMES: Tuesday | Periods 6-8 (12:50 PM – 3:50 PM); Classroom: ARCH 0439
OFFICE HOURS: Tuesday 4:00 pm – 5:30 pm, by appointment and listed on the office door.
COURSE TA/COORDINATOR: No TA
COURSE WEBSITE: All materials are posted on the Canvas e-Learning University of Florida. The course may be accessed at http:/elearning.ufl.edu/
COURSE COMMUNICATIONS: For on campus students in class, in classroom or during office hours or communication through Canvas email within e-Learning. (Any emails received outside the e-Learning system will not receive a response.)

Materials

REQUIRED TEXT: No required text. However, for students that wish more detailed information or are having trouble with concepts for this course the following resources are recommended:
>   ArcGIS 9, Getting Started With ArcGIS, ESRI Press, 2004 (Optional)
>   ArcGIS 9, Using ArcGIS Spatial Analyst, ESRI Press 2004 (Optional)
>   Both books are available in .PDF format for download on the course website.

SOFTWARE: Students will use the UFApps ArcGIS installation of ArcGIS 10.5. (Software for individual licenses of ArcGIS version 10.5 for on-campus use may be obtained by applying at http://www.geoplan.ufl.edu/software/student_license.php)

PREREQUISITE KNOWLEDGE AND SKILLS: None (knowledge of basic computer skills, Windows Operating Systems, Excel, etc. is useful, but not required.)

Course Learning Objectives

Upon successful completion of the course, students will be able to:

1. Define a Geographic Information System (GIS), and identify the different "system" components that make up a GIS.
2. Identify and access sources for GIS data including the Florida Geographic Data Library.
3. Discuss the history of GIS, and how it has evolved into the technology, we use today.
4. Explain and interpret how GIS is used in real-world spatial analysis.
5. Recognize and explain the two models for representing spatial data: vector and raster.

6. Recognize the common GIS data formats: coverages, shapefiles, and geodatabases.
7. Name each ArcGIS application (ArcMap, ArcCatalog, and ArcToolbox), and explain the general use of each.
8. Discuss how factors such as scale, resolution, and accuracy can impact GIS analysis and how accurately the location and shape of map features can be depicted for a given map scale.
9. Explain the concept of coordinate systems and projections and how these factors allow mapping distortion to be minimized in the area of interest.
10. Define projection and coordinate system information for feature datasets, as well as convert coordinates between different systems and formats.
11. Use and apply basic functionality of ArcMap including selection by attributes, selection by location, map display using data view or layout view, understanding the table of contents, data frames, and layers, changing the symbology of a layer and setting bookmarks.
12. Identify and discuss the components of a table.
13. Add items to tables.
14. Compare and contrast joining and relating tables, and apply the appropriate use for each method.
15. Describe and complete the editing process in ArcMap including use of the Editor toolbar for creating and editing features and attributes.
16. Create new shapefiles in ArcCatalog, and then add features and attribute data with editing in ArcMap.
17. Make use of the "Add XY Data" tool to add GPS data to a map.
18. Describe the geocoding process for assigning location (points) to addresses.
19. Setup and create a geodatabase in ArcCatalog.
20. Utilize Network Analyst to solve common network problems.
21. Describe and apply methods to create a buffer around selected points, lines, or area features for proximity analysis.
22. Identify ways that buffers can be used with overlay tools, such as Clip, to identify and clip features from other GIS layers which fall within the buffer areas.
23. Describe and use the various overlay tools.
24. Describe how the tools overlay different layers of features to create new information identifying the spatial relationships between the inputs.
25. Identify the steps required to plan, implement, and carry through to completion a successful vector GIS analysis project.
26. Contrast raster and vector, and be able to identify the appropriate use of each GIS data model for analysis.
27. Identify two types of raster data, discrete and continuous, and discuss how each is used to represent raster cell values.
28. Describe the uses of the Distance and Density tools, and what is represented by the rasters resulting from each of these functions.
29. Identify and discuss the appropriate uses of the Inverse Distance Weighted and Spline Interpolation methods for creating a prediction surface from sampled point values.
30. Identify and discuss the operation and use of each of the surface analysis tools.
31. Contrast local, neighborhood, and zonal statistics functions.
32. Identify appropriate uses of local, neighborhood, and zonal statistics for analysis.
33. Identify and discuss the reasons for reclassifying raster data and how to use the Reclassify tool.
34. Discuss the use of the Raster Calculator.
35. Convert vector data to raster data.
36. List and complete the steps required to plan, implement, and carry through to completion a successful raster GIS analysis project.

Expectations, Evaluation and Grading

Attendance Policy. Mandatory, on time. If you miss class, it will be your responsibility to find out about discussions and activities you missed.

Late Submission. Students must submit assignments at the appointed time or a grade deduction will be enforced. Students with a valid reason (required university-sanctioned event or medical excuse) will be allowed to submit assignments after a posted due date with instructor's approval.

Grading Policy. Grades are determined only by points earned on exams and other assignments given during the semester. There is no opportunity other than what is explicitly stated in this syllabus to earn points, that is, no special assignments nor additional work beyond that given other students.

1. Class Participation 5%
2. Homework Assignments 25%
3. Exercises & Quizzes 15%
4. Project 1 10%
5. Project 2 10%
6. Final Examination 30%
7. Practices with Web GIS or Open-Sourced GIS 5%

Final grades will be calculated as follows:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
94 or above	90-93	87-89	84-86	80-83	77-79	74 -76	70-73	67-69	64-66	60-63	60 or below

UF Policies:

Academic Honesty
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 at https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/

Disabilities
University Policy on Accommodating Students with Disabilities: Students requesting accommodation for disabilities must first register with the Dean of Students Office (http://www.dso.ufl.edu/drc/). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

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Netiquette: Communication Courtesy
All members of the class are expected to follow rules of common courtesy in all messages, threaded discussions and chats. Course communication should be civilized and respectful to everyone. 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. http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf

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.

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.*"

Course Evaluation
Students in this class are participating in the pilot evaluation of the new course evaluation system called GatorEvals. The new evaluation system is designed to be more informative to instructors so that teaching effectiveness is enhanced and to be more seamlessly linked to UF's CANVAS learning management system. Students can complete their evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/ . Please note your other classes this semester may be evaluated in the current GatorRater online evaluation system at https://evaluations.ufl.edu . Thank you for serving as a partner in this important effort.

Getting Help:

For issues with technical difficulties for E-learning in Canvas please contact the UF Help Desk at:
- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- http://elearning.ufl.edu/

Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of

the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

For issues with UF Apps please submit Help Request Form at:

- **https://info.apps.ufl.edu/help-request/**

Other resources are available at http://www.distance.ufl.edu/getting-help for:

- Online Library Help Desk support
- Disability resources
- Counseling and Wellness resources

Tentative Weekly Schedule

Weeks	Dates	Topics	Assignments Assigned (Tuesdays)	Due (Tuesdays)
Week 1	Aug 20	Course Introduction, Intro to GIS Concepts, GIS Software	HW1	
Week 2	Aug 27	Spatial Data Formats; File Structure; Database Management; Intro to ArcCatalog, ArcMap, ArcGIS Pro and Enterprise	EX1	HW1
Week 3	Sep 3	Map Characteristics, Map Projections, Intro to ArcToolBox	EX2, HW2	EX1
Week 4	Sep 10	Building Geodatabases; Editing and Creating Feature	EX3, HW3	EX2, HW2
Week 5	Sep 17	Geocoding; Working with Selection Tools	EX4, HW4	EX3, HW3
Week 6	Sep 24	Working with Tables; Joining and Relating Data; Adding Items	HW5	EX4, HW4
Week 7	Oct 1	Preparing Data for Analysis (Dissolve & Clip); Geoprocessing Vector Data (Buffer & Overlay)	Project 1	HW5
Week 8	Oct 8	Problem Solving using Vector GIS; **Project 1**		
Week 9	Oct 15	Raster Data and Analysis, Raster Layer Properties, Mapping Distance	HW6, EX 6	Project 1
Week 10	Oct 22	Mapping Density; Hot Spot Analysis; Intro to QGIS	HW7, EX7	HW6, EX 6
Week 11	Oct 29	Interpolation Methods	HW8, EX8	HW7, EX7
Week 12	Nov 5	Surface Analysis: Contour, Slop, Aspect, Hillshade, Viewshed, and Cut/Fill	HW9, EX9	HW8, EX8
Week 13	Nov 12	Calculating Cell, Neighborhood, and Zonal Statistics Reclassifying Data; Intro to ModelBuilder; **Project 2**	HW10, EX10, Project 2	HW9, EX9

Week 14	Nov 19	Using Raster Calculator, Converting Data;		HW10, EX10
Week 15	Nov 26	Final Exam Review; Project 2		
Week 16	Dec 3	**Final Exam**		Project 2

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Disclaimer: This syllabus represents our 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.