

## URP 6270 Introduction to Planning Information Systems Spring 2020

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Note: All email communication should be through Canvas. Use this email address only if you have an emergency and/or are unable to access Canvas email.

### Course Description

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Introduction to Planning Information Systems is intended to introduce graduate students in Urban and Regional Planning to the concepts, principles, and the reality of using Geographic Information Systems (GIS). GIS provides users with a very effective tool for capture, analysis, and display of spatial data that is crucial to the planning process and decision-making. The course is theoretical and practical (i.e., very hands-on), addressing both the structure of geographic information systems and their use for spatial analysis and data management. By the conclusion of this class, a student should understand basic GIS theory and principles, operations, and applications; have a solid working knowledge of the ArcGIS software; the ability to employ GIS-based solutions to geographic modeling and analysis tasks; and be able to create maps that effectively convey spatial information and analyses.

### Course Objectives

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

- Define a Geographic Information System (GIS), and identify the different "system" components that make up a GIS.
- Identify and access sources for GIS data including the Florida Geographic Data Library.
- Discuss the history of GIS, and how it has evolved into the technology we use today.
- Explain and interpret how GIS is used in real world spatial analysis.
- Recognize and explain the two models for representing spatial data: vector and raster.
- Recognize the common GIS data formats: coverages, shapefiles, and geodatabases.
- Name each ArcGIS application (ArcMap, ArcCatalog, and ArcToolbox), and explain the general use of each.
- 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.
- Explain the concept of coordinate systems and projections and how these factors allow mapping distortion to be minimized in the area of interest.

- Define projection and coordinate system information for feature datasets, as well as convert coordinates between different systems and formats.
- 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.
- Identify and discuss the components of a table.
- Add items to tables.
- Compare and contrast joining and relating tables, and apply the appropriate use for each method.
- Describe and complete the editing process in ArcMap including use of the Editor toolbar for creating and editing features and attributes.
- Create new shapefiles in ArcCatalog, and then add features and attribute data with editing in ArcMap.
- Make use of the "Add XY Data" tool to add GPS data to a map.
- Describe the geocoding process for assigning location (points) to addresses.
- Setup and create a geodatabase in ArcCatalog.
- Utilize Network Analyst to solve common network problems.
- Describe and apply methods to create a buffer around selected points, lines, or area features for proximity analysis.
- 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.
- Describe and use the various overlay tools.
- Describe how the tools overlay different layers of features to create new information identifying the spatial relationships between the inputs.
- Identify the steps required to plan, implement, and carry through to completion a successful vector GIS analysis project.
- Contrast raster and vector, and be able to identify the appropriate use of each GIS data model for analysis.
- Identify two types of raster data, discrete and continuous, and discuss how each is used to represent raster cell values.
- Describe the uses of the Distance and Density tools, and what is represented by the rasters resulting from each of these functions.
- Identify and discuss the appropriate uses of the Inverse Distance Weighted and Spline Interpolation methods for creating a prediction surface from sampled point values.
- Identify and discuss the operation and use of each of the surface analysis tools.
- Contrast local, neighborhood, and zonal statistics functions.
- Identify appropriate uses of local, neighborhood, and zonal statistics for analysis.
- Identify and discuss the reasons for reclassifying raster data and how to use the Reclassify tool.
- Discuss the use of the Raster Calculator.
- Convert vector data to raster data.
- List and complete the steps required to plan, implement, and carry through to completion a successful raster GIS analysis project.

## Required Materials

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The GIS software we will be using for this class is ArcGIS 10.X. The ArcGIS software is available on UFApps (<http://info.apps.ufl.edu/>) OR by download from UF GeoPlan. UFApps provides access to software applications from any computing device from any location, at any time.

In order to access UFApps and ArcGIS you will need to install Citrix Receiver.

- Open your browser and navigate to <http://info.apps.ufl.edu/>.
- Scroll down to the *First Time Use Questions* section and
  - click on *Access UFApps from a PC if you are using a PC* or *Access UFApps from a Mac if using a Mac*.
- The instructions will guide you through installing Citrix Receiver.
- Note: UFApps offers an in-browser *light* version. This option is not recommended.

The other option is to request a full installation of ArcGIS onto your computer by visiting [http://www.geoplan.ufl.edu/softwareforms/student\\_license.php](http://www.geoplan.ufl.edu/softwareforms/student_license.php). **This will only work on a Windows computer.** Download instructions (after your request is approved) are here: [http://www.geoplan.ufl.edu/software/arcgis-desktop/student\\_install/](http://www.geoplan.ufl.edu/software/arcgis-desktop/student_install/).

## Computer that meets or exceeds the specifications below.

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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.
Internet Access	High speed internet access is highly recommended.

## Recommended Materials

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Note: Both texts are available in .PDF format for downloading.

- [\*ArcGIS 9, Getting Started With ArcGIS, ESRI Press, 2004 \(optional\)\*](#)
- [\*ArcGIS 9, Using ArcGIS Spatial Analyst, ESRI Press 2004 \(optional\)\*](#)

## Course Outline

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Week	Topics Covered
1	<ul style="list-style-type: none"><li>• Module 1, Lesson 1, Course Introduction</li><li>• Module 1, Lesson 2, Introduction to GIS Concepts</li><li>• Module 1, Lesson 3, Spatial Data Formats, File Structure, Overview of ArcGIS</li></ul>
2	<ul style="list-style-type: none"><li>• Module 2, Lesson 4, Map Characteristics, Map Projections</li><li>• Module 2, Lesson 5, Working with Selection Tools, Introduction to ArcMap</li><li>• Module 2, Lesson 6, Working with Tables; Joins and Relates</li></ul>
3	<ul style="list-style-type: none"><li>• Module 3, Lesson 7, Editing and Creating Data</li><li>• Module 3, Lesson 8, Spatial Modeling and Introduction to Geodatabases; Network Analyst</li></ul>
4	<ul style="list-style-type: none"><li>• Module 4, Lesson 9, Proximity Analysis, Buffers, Introduction to Overlay Analysis</li><li>• Module 4, Lesson 10, Overlay Analysis, Problem Solving using Vector GIS</li><li>• Module 4, Lesson 11, Planning a Vector GIS Project</li></ul>
5	<ul style="list-style-type: none"><li>• Module 5, Lesson 1, Introduction to Raster Data and Analysis</li><li>• Module 5, Lesson 2, Raster Layer Properties; Mapping Distance; Mapping Density</li></ul>
6	Module 6, Lesson 3, Interpolating to Raster
7	<ul style="list-style-type: none"><li>• Module 7, Lesson 4, Performing Surface Analysis</li><li>• Module 7, Lesson 5, Calculating Cell, Neighborhood, and Zonal Statistics</li></ul>
8	Module 8, Lesson 6, Reclassifying Data; Using the Raster Calculator; Converting Data

## Course Grade

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Component	Percent of Grade
Homework	20%
Exercises	10%
Discussions	5%
Projects	20%
Midterm Exam	20%
Final Exam	25%
<b>Total</b>	<b>100%</b>

## Course Grade

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Letter Grade	Percentage	Grade Points
A	94-100%	4.00
A-	90-93%	3.67
B+	87-89%	3.33
B	84-86%	3.00
B-	80-83%	2.67
C+	77-79%	2.33
C	74-76%	2.00
C-	70-73%	1.67
D+	67-69%	1.33
D	64-66%	1.00
D-	60-63%	0.67
E	Below 60 %	0.00

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

## Course Participation and Discussion Boards

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While face-to-face attendance is not required, course participation is part of your grade for the course. Participation will be evaluated by discussion board postings. Students should submit

one post in response to the initial prompt, then at least two other posts in response to classmates. All postings should be substantial in quality (not simply "I agree" or "I disagree").

## **Make-up Work and Exams**

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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 Communication**

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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. Use an alternate email address only if you have an emergency and/or are unable to access Canvas email.

## **Netiquette**

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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.

## **Student Support Services**

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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>.

For a list of additional student support services links and information please visit: <http://www.distance.ufl.edu/student-services>.

## University Policies

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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](#) and at the [Dean of Students website](#).

## Student Honor Code

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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."

## Special Accommodations

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Students requesting disability-related academic accommodations must first register with the Disability Resource Center: <http://www.dso.ufl.edu/drc/>.

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

## Complaints

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Should you have any complaints with your experience in this course please visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

## Copyright

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Course materials may be protected by copyright and are for the exclusive use of enrolled students. Course materials may not be further disseminated.

## Changes to the Syllabus

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The faculty reserves the right to make changes to the course syllabus and course schedule. In the event that changes become necessary, students will be notified through Canvas email.

## Course Feedback

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Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.