

# URP 6275: Intermediate Planning Information Systems

**3 credits**

**Summer B Semester 2017**

## **INSTRUCTOR**

**Katherine Norris**

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131 Architecture Building

**OFFICE HOURS:** By appointment

## **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**

*Modeling Our World, Second Edition: The Esri Guide to Geodatabase Concepts* by Michael Zeiler

<http://esripress.esri.com/display/index.cfm?fuseaction=display&websitelD=178>

## **COURSE DESCRIPTION**

This course builds upon the foundational concepts and principles of Geographic Information Systems (GIS) introduced in URP 6270, Introduction to Planning Information Systems. This course will advance both the technical skills and theoretical/ conceptual skills to allow students to solve intermediate spatial problems using GIS. Primarily using ArcGIS software, students will learn intermediate concepts and skills for data management, editing, analysis, and automation. Additionally, students will learn about common errors and pitfalls with GIS data and how to troubleshoot and correct the issues.

## **PREREQUISITE KNOWLEDGE OR SKILLS**

Completion of URP 6270, Introduction to Planning Information Systems.

## **COURSE GOALS AND/OR OBJECTIVES**

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

- Identify and resolve common errors and inconsistencies in spatial and attribute data.
- Understand geoprocessing functionality and how to appropriately apply for geospatial problem solving.

- Understand how to structure and execute SQL queries for data analysis and manipulation.
- Be able to edit geographic features and attributes within GIS data.
- Be able to geocode address information.
- Understand how to manage and organize GIS project files.
- Understand and execute basic automation techniques within ArcGIS Desktop.
- Understand the difference between open source and proprietary GIS software, and the availability of each.

## **INSTRUCTIONAL METHODS**

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

## **COURSE POLICIES**

### **ATTENDANCE POLICY**

Students are responsible for satisfying all academic objectives as defined by the instructor. Absences count from the first class meeting. In general, acceptable reasons for absence from or failure to participate in class include illness, serious family emergencies, special curricular requirements (e.g., judging trips, field trips, and professional conferences), military obligation, severe weather conditions, religious holidays, and participation in official university activities such as music performances, athletic competition or debate. Absences from class for court-imposed legal obligations (e.g., jury duty or subpoena) must be excused. Other reasons also may be approved.

Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence.

Students cannot participate in classes unless they are registered officially or approved to audit with evidence of having paid audit fees. The Office of the University Registrar provides official class rolls to instructors.

If a student does not participate in at least one of the first two class meetings of a course or laboratory in which they are registered, and he or she has not contacted the department to indicate his or her intent, the student can be dropped from the course. Students must not assume that they will be dropped, however. The department will notify students if they have been dropped from a course or laboratory.

The university recognizes the right of the individual professor to make attendance mandatory. After due warning, professors can prohibit further attendance and subsequently assign a failing grade for excessive absences.

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:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

### **MAKE-UP POLICY**

Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence, if the absence is due to the one of accepted reasons listed in the Attendance Policy.

If you are unable to turn in an assignment on time, please contact me before the due date to discuss your options. A grade reduction of 5% per day will occur unless there is an acceptable excuse for the late submittal.

Computer problems that arise during submission will not be accepted as an excuse for late work. In the event that you have technical difficulties with e-Learning, please contact the UF Help Desk. If technical difficulties 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.

### **HOMEWORK ASSIGNMENT POLICY**

Homework assignments and their due dates are specified in the course schedule. Homework assignments are due on the last day of the week by 10pm, unless otherwise stated in the course schedule.

### **QUIZ & EXAM POLICIES**

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

### **COURSE TECHNOLOGY**

This course will be using ArcGIS Desktop 10.4.1. You can choose to download and run ArcGIS on your personal computer or via UFApps.

#### Acquiring Desktop software license for ArcGIS

Students can acquire the latest version of ArcGIS software and a student license from the GeoPlan Center. Please note: it may take up to 24 hours to receive your software license. It is recommended that students install ArcGIS software prior to beginning the class:

<http://geoplan.ufl.edu/software/software.shtml>

#### Accessing ArcGIS via UFApps

The ArcGIS software is available on UFApps (<http://info.apps.ufl.edu/>). UFApps provides access to software applications from any computing device--laptops, tablets, desktops, and smartphones--from any location, at any time.

In order to access UFApps and ArcGIS you will need to install Citrix Receiver which is available from the UFApps website.

- 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,
  - click on Access UFApps from a Mac if using a Mac.
- The instructions will guide you through installing Citrix Receiver and logging in to UFApps.

## 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

#### Summary:

Component	Percent of Grade
Homework Assignments	56%
Quizzes	24%
Final Project	20%

#### Per Individual Assignment:

Component	Percent of Total Grade	Points
Homework 1	7%	70
Homework 2	7%	70
Homework 3	7%	70
Homework 4	7%	70
Homework 5	7%	70
Homework 6	7%	70
Homework 7	7%	70
Homework 8	7%	70
Quiz 1	6%	60
Quiz 2	6%	60
Quiz 3	6%	60
Quiz 4	6%	60
Final Project	20%	200
<b>Total</b>	<b>100%</b>	<b>1000</b>

## 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.

# COURSE SCHEDULE

## CRITICAL DATES

Assignment	Date Due
Homework 1	End of Week 1
Homework 2	End of Week 2
Homework 3	End of Week 3
Homework 4	End of Week 4
Homework 5	End of Week 5
Homework 6	End of Week 6
Homework 7	End of Week 7
Homework 8	End of Week 8
Quiz 1	End of Week 2
Quiz 2	End of Week 4
Quiz 3	End of Week 6
Quiz 4	End of Week 7
Final Project	End of Week 8

## WEEKLY SCHEDULE OF TOPICS AND ASSIGNMENTS

Module	Topic	Sub-topics Covered
1	<b>GIS Project &amp; Data Design</b>	1.1 Project Management 1.2 What is Your Environment? 1.3 Where and How to Get Data 1.4 Data Best Practices 1.5 Spatial Data Design and Management 1.6 Required Reading Modeling Our World (2010), Chapter 1: Inside the Geodatabase Modeling Our World (2010), Chapter 2: Coordinate Systems and Map Projections 1.7 Assignments Homework 1: More info to follow. Discussion 1:
2	<b>Working with Dirty Data</b>	2.1 What is Dirty Data? 2.2 Recognizing Geospatial Dirty Data 2.3 Geoprocessing Tools for Dirty Data 2.4 Geoprocessing Techniques for Dirty Data



		<p>2.5 Required Reading</p> <p>2.6 Assignments</p> <p>Module 1&amp;2 Quiz</p> <p>Discussion 2:</p> <p>Homework 2: Review assigned layer using QAQC methods. Describe any errors found and how you would correct them. Justify whether you think this data is fit to use for analysis. Provide a 1-2 paragraph written description to these questions.</p>
3	<b>Working with Attribute Tables Part 1</b>	<p>3.1 Choosing Appropriate Field Types and Data Types</p> <p>3.2 Table Selections</p> <p>3.3 Table Join Basics</p> <p>3.4 Table Join Advanced</p> <p>3.5 Spatial Joins</p> <p>3.6 Table Attachments</p> <p>3.7 Required Reading</p> <p>Modeling Our World (2010), Chapter 3: Vector Modeling With Features</p> <p>3.8 Assignments</p> <p>Discussion 3:</p> <p>Homework 3: Joining Tables Exercises.</p>
4	<b>Working with Attribute Tables Part 2</b>	<p>4.1 Restructuring Tables</p> <p>4.2 Field Calculator Basics</p> <p>4.3 Field Calculator VB Functions</p> <p>4.4 Field Calculator Python Functions</p> <p>4.5 Field Calculator Advanced</p> <p>4.6 Working with Non-standard Formats and Non-standard Calculations</p> <p>4.7 Required Reading</p> <p>4.8 Assignments</p> <p>Module 3 &amp; 4 Quiz</p> <p>Discussion 4:</p> <p>Homework 4: Parse fields from Non-standard data and perform outlined field calculations.</p>
5	<b>Geoprocessing &amp; Analysis Tools</b>	<p>5.1 Working with Large Datasets</p> <p>5.2 Intermediate Editing Techniques</p> <p>5.3 Intermediate Geocoding</p> <p>5.4 Geoprocessing Tools (SRL Examples)</p> <p>5.5 Metadata Creation</p> <p>5.6 Map Production</p> <p>5.7 Required Reading</p> <p>Modeling Our World (2010), Chapter 6: Finding Places With Locators</p>

		<p>Modeling Our World (2010), Chapter 10: Multiuser Editing With Versioning (Not Required)</p> <p>Making a Meaningful Map, 2011  <a href="http://www.esri.com/news/arcuser/0911/making-a-map-meaningful.html">http://www.esri.com/news/arcuser/0911/making-a-map-meaningful.html</a></p> <p>Make Maps People Want to Look At, 2012  <a href="http://www.esri.com/news/arcuser/0112/make-maps-people-want-to-look-at.html">http://www.esri.com/news/arcuser/0112/make-maps-people-want-to-look-at.html</a></p> <p>Using a Mapmaking Checklist for Map Design, 2012  <a href="https://blogs.esri.com/esri/arcgis/2012/05/03/using-a-mapmaking-checklist-for-map-design/">https://blogs.esri.com/esri/arcgis/2012/05/03/using-a-mapmaking-checklist-for-map-design/</a></p> <p>5.8 Assignments  Discussion 5:  Homework 5: Perform; Geocoding, Geoprocessing, Metadata Creation, &amp; Map Creation Exercises.</p>
6	<b>Batch Processing, Model Builder, and Python Scripting</b>	<p>6.1 Automation Concepts</p> <p>6.2 Batch Commands</p> <p>6.3 Introduction to Model Builder</p> <p>6.4 Introduction to Python Scripting and ArcPy</p> <p>6.5 Required Reading  Modeling Our World (2010), Chapter 11: Geoprocessing with Models and Scripts</p> <p>6.6 Assignments  Module 5 &amp; 6 Quiz  Discussion 6:  Homework 6: Perform; Batch Processing, Model Builder, &amp; Python Exercises.</p>
7	<b>Imagery &amp; Remote Sensing</b>	<p>7.1 Introduction to Imagery &amp; Remote Sensing</p> <p>7.2 Data Sources and Portals (Working with Basemap and Imagery Services)</p> <p>7.3 Image Analysis (Accessing and Using Satellite and Elevation Data)</p> <p>7.4 Georeferencing Basics</p> <p>7.5 Introduction to Lidar</p> <p>7.6 Required Reading  Modeling Our World (2010), Chapter 7: Imagery and Cell Modeling With Rasters and Mosaics  Modeling Our World (2010), Chapter 8: Surface Modeling With Terrains  Remote Sensing Introduction &amp; History  <a href="http://earthobservatory.nasa.gov/Features/RemoteSensing/">http://earthobservatory.nasa.gov/Features/RemoteSensing/</a>  Catalog of Earth Satellite Orbits  <a href="http://earthobservatory.nasa.gov/Features/OrbitsCatalog/">http://earthobservatory.nasa.gov/Features/OrbitsCatalog/</a></p>

		<p>How to Interpret a Satellite Image: Five Tips and Strategies  <a href="http://earthobservatory.nasa.gov/Features/ColorImage/">http://earthobservatory.nasa.gov/Features/ColorImage/</a>  Why is that Forest Red and that Cloud Blue? How to Interpret a False-Color Satellite Image  <a href="http://earthobservatory.nasa.gov/Features/FalseColor/">http://earthobservatory.nasa.gov/Features/FalseColor/</a>  Measuring Vegetation (NDVI &amp; EVI)  <a href="http://earthobservatory.nasa.gov/Features/MeasuringVegetation/">http://earthobservatory.nasa.gov/Features/MeasuringVegetation/</a>  Landsat 8 Bands  <a href="http://landsat.gsfc.nasa.gov/?page_id=5377">http://landsat.gsfc.nasa.gov/?page_id=5377</a>  What are the best spectral bands to use for my study?  <a href="http://landsat.usgs.gov/best_spectral_bands_to_use.php">http://landsat.usgs.gov/best_spectral_bands_to_use.php</a></p> <p>7.7 Assignments  Module 7 Quiz  Discussion 7:  Homework 7: Landsat8 Exercise, Georeferencing Exercise</p>
8	<b>Free and Open Source Software (QGIS) and Data</b>	<p>8.1 Introduction to Open Source Concepts  8.2 Open Data and Open Data Formats  8.3 Open Source GIS and Database Software  8.4 Introduction to QGIS  8.5 Optional Readings  QGIS Training Manual:  <a href="http://docs.qgis.org/2.8/en/docs/training_manual/index.html">http://docs.qgis.org/2.8/en/docs/training_manual/index.html</a>  QGIS User Guide:  <a href="http://docs.qgis.org/2.8/pdf/en/">http://docs.qgis.org/2.8/pdf/en/</a></p> <p>8.6 Assignments  Discussion 8:  Homework 8:  1. Exercise: Evaluate a FOSS product  2. Exercise: Hotspot Analysis with QGIS  Final Project Presentation</p>

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.