

URP 6275: Intermediate Planning Information Systems

3 credits

Summer B Semester 2017

June 22 – August 12, 2017

INSTRUCTOR

Katherine Norris

131 Architecture Building

OFFICE HOURS: By appointment

COURSE WEBSITE:

<http://elearning.ufl.edu>

Direct link to course:

<https://ufl.instructure.com/courses/339555>

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&websiteID=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, discussions, and exercises and their due dates are specified in the course schedule in Canvas.

QUIZ & EXAM POLICIES

Quizzes and a Final Exam 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 \(Links to an external site.\)](http://helpdesk.ufl.edu). For a list of additional student support services links and information please visit: [http://www.distance.ufl.edu/student-services \(Links to an external site.\)](http://www.distance.ufl.edu/student-services).

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
Discussions	5%
Exercises	25%
Homework Assignments	25%
Quizzes	25%
Final Exam	20%

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

WEEKLY SCHEDULE OF TOPICS AND ASSIGNMENTS

Module	Topic	Sub-topics Covered
1	GIS Project & Data Design 6/22 – 6/28	1.1 GIS Project Management 1.2 What is Your Environment? Systems Architecture, GIS Hardware and Software Capabilities 1.3 Where and How to Get Data 1.4 Data Best Practices 1.5 Spatial Data Design and Management Required Reading Modeling Our World (2010), Chapter 1: Inside the Geodatabase Modeling Our World (2010), Chapter 2: Coordinate Systems and Map Projections Assignments Discussion 1: Introduction Exercise 1: Working with the Geodatabase Homework 1: Create a Map with Multiple Data Sources
2	Working with Dirty Data 6/29 – 7/3	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 Required Reading Learn How to Create a Map Topology in ArcGIS 10.1, ESRI website: http://www.esri.com/news/arcwatch/1112/learn-how-to-create-a-map-topology-in-arcgis101.html Assignments Discussion 2: Dirty Data in You Life Exercise 2: Recognizing Dirty Data Homework 2: Combining Land Use Data from Different Sources Quiz - Module 1&2
3	Working with Attribute Tables Part 1	3.1 Introduction to Fields Part 1 3.2 Introduction to Fields Part 2 3.3 Introduction to Tables

	7/4 – 7/9	<p>3.4 Working with Tables Part 1 3.5 Working with Tables Part 2 3.6 Table Attachments</p> <p>Required Reading Modeling Our World (2010), Chapter 3: Vector Modeling With Features</p> <p>Assignments Exercise 3: Performing queries with Field Calculator Exercise 4: Adding Attachments Exercise 5: Create a Point Feature Class with Geotagged Photos Homework 3: Relationship Classes</p>
4	<p>Working with Attribute Tables Part 2</p> <p>7/10 – 7/15</p>	<p>4.1 Restructuring Tables 4.2 Field Calculator Basics 4.3 Field Calculator VB Functions 4.4 Field Calculator Python Functions 4.5 Field Calculator Advanced</p> <p>Assignments Exercise 6: Field Calculations Homework 4: Clean up a Dirty Dataset Quiz - Module 3 & 4</p>
5	<p>Geoprocessing & Analysis Tools</p> <p>7/16 – 7/22</p>	<p>5.1 Working with Large Datasets 5.2 Intermediate Geocoding – Part 1 5.3 Intermediate Geocoding – Part 2 5.3 Intermediate Editing Techniques 5.4 Metadata Creation 5.5.1 Map Making – Part 1 5.5.2 Map Making – Part 2</p> <p>Required Reading Modeling Our World (2010), Chapter 6: Finding Places With Locators Making a Meaningful Map, 2011 http://www.esri.com/news/arcuser/0911/making-a-map-meaningful.html Make Maps People Want to Look At, 2012 http://www.esri.com/news/arcuser/0112/make-maps-people-want-to-look-at.html Using a Mapmaking Checklist for Map Design, 2012 https://blogs.esri.com/esri/arcgis/2012/05/03/using-a-mapmaking-checklist-for-map-design/</p>

		<p>Assignments</p> <p>Exercise 7: Creating a Single Color Drop Shadow</p> <p>Exercise 8: Basic Geocoding in ArcGIS</p> <p>Exercise 9: Metadata Creation</p> <p>Homework 5: Geocoding – Building Locators in ArcGIS</p>
6	<p>Batch Processing, Model Builder, and Python Scripting</p> <p>7/23 – 7/29</p>	<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>Required Reading</p> <p>Modeling Our World (2010), Chapter 11: Geoprocessing with Models and Scripts</p> <p>Assignments</p> <p>Exercise 10: Batch Tools</p> <p>Exercise 11: Introduction to Model Builder</p> <p>Exercise 12: Create a Script tool</p> <p>Homework 6: Model Builder</p> <p>Quiz: Module 5 & 6</p>
7	<p>Imagery & Remote Sensing</p> <p>7/30 – 8/5</p>	<p>7.1 Introduction to Imagery & 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 Raster Data Management</p> <p>Required Reading</p> <p>Modeling Our World (2010), Chapter 7: Imagery and Cell Modeling with Rasters and Mosaics</p> <p>Modeling Our World (2010), Chapter 8: Surface Modeling with Terrains</p> <p>Course Material Package</p> <p>Remote Sensing Introduction & History</p> <p>http://earthobservatory.nasa.gov/Features/RemoteSensing/</p> <p>Catalog of Earth Satellite Orbits</p> <p>http://earthobservatory.nasa.gov/Features/OrbitsCatalog/</p> <p>How to Interpret a Satellite Image: Five Tips and Strategies</p> <p>http://earthobservatory.nasa.gov/Features/ColorImage/</p>

		<p>Why is that Forest Red and that Cloud Blue? How to Interpret a False-Color Satellite Image http://earthobservatory.nasa.gov/Features/FalseColor/ Measuring Vegetation (NDVI & EVI) http://earthobservatory.nasa.gov/Features/MeasuringVegetation/ Landsat 8 Bands http://landsat.gsfc.nasa.gov/?page_id=5377 What are the best spectral bands to use for my study? http://landsat.usgs.gov/best_spectral_bands_to_use.php</p> <p>Assignments Exercise 13: Accessing Imagery Exercise 14: Georeference an Image Homework 7: Add and Visualize Lidar Data Quiz: Module 7</p>
<p>8</p>	<p>Free and Open Source Software and Data</p> <p>8/6 – 8/12</p>	<p>8.1 Free and Open Source Software 8.2 Open Data and Open Data Formats 8.3 Free and Open Source GIS, Libraries, and Database Software 8.4 Introduction to QGIS</p> <p>Readings</p> <p>What is Free Software? https://www.gnu.org/philosophy/free-sw.en.html</p> <p>The Open Source Definition https://opensource.org/osd-annotated</p> <p>A Short Guide to Open Source Licenses https://www.smashingmagazine.com/2010/03/a-short-guide-to-open-source-and-similar-licenses/</p> <p>Americans Use More Public Data than they Think http://www.pbs.org/newshour/rundown/many-americans-dont-know-theyre-using-government-data-using-apps-like-uber-pew-reports-says/</p> <p>27 Differences Between ArcGIS and QGIS http://gisgeography.com/qgis-arcgis-differences/</p> <p>At Least 10 Reasons you should be Using QGIS https://www.birdseyeviewgis.com/blog/2017/5/1/at-least-10-reasons-you-should-be-using-qgis</p> <p>GRASS GIS - Geographic Resources Analysis Support System</p>

		<p>http://gisgeography.com/grass-gis-geographic-resources-analysis-support-system/</p> <p>QGIS Training Manual (for reference) http://docs.qgis.org/2.8/en/docs/training_manual/index.html</p> <p>QGIS User Guide (for reference) http://docs.qgis.org/2.2/pdf/en/QGIS-2.2-UserGuide-en.pdf</p> <p>QGIS Stack Exchange (for reference) https://gis.stackexchange.com/</p> <p>Assignments Exercise 15: Getting Started with GIS Homework 8: Heatmap Analysis with QGIS Homework 9: Geocoding with MMQGIS</p> <p>Optional Readings QGIS Training Manual: http://docs.qgis.org/2.8/en/docs/training_manual/index.html QGIS User Guide: http://docs.qgis.org/2.8/pdf/en/</p> <p>Final Exam (due by 8/15 11:55pm)</p>
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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.