Course Prefix / Number: GIS 4043/L


Course Title: Introduction to Geographic Information Systems and Laboratory

Course Credit Hours: 4

Instructor Name: Amber Bloechle

Graduate Assistant (GA): Claire Lacey

Prerequisites or Co-Requisites: None

Course Description:

An undergraduate-level Geographic Information Systems and G.I. Science-focused course in the Department of Environmental Studies at the University of West Florida.

Permission is required. Software access fee is assessed with tuition.

Prerequisites

No prior knowledge of GIS is required to take this course; however, there is a lot of material to cover and this will be a fast-moving and fairly technologically advanced course. As such, there are a few basic prerequisites:

- Competence with the Windows XP operating system, including the storing, copying and management of multiple data types; managing multiple windows and applications; and discipline to save work frequently
- Familiarity with data entry, sorting, editing and filtering using Microsoft Excel
- A strong motivation to learn, explore and have fun with computer applications is essential. This course will require a significant amount of independent work and relies heavily on student initiative
- A UWF Argonet E-mail account that you plan to check frequently
  - You will be asked to provide your blog link via email using your UWF email account on the first day of class in order to facilitate communications with the instructor
  - This will also let me know you are making your way through course orientation materials
  - I will only answer course related emails sent from your UWF email account

Course Overview
Geographic Information Systems and Geographic Information Science, GIS, is a rapidly evolving technology involving the study of spatial (geographic) location of features on the Earth’s surface and the relationships between them. Because the work of various industries (see ESRI.com Industries) involves the study of location and spatial relationships, today’s employers increasingly expect graduates of related degree programs, new applicants and current staff to possess a working knowledge of GIS. Environmental Systems Research Institute’s (ESRI) suite of GIS software - ArcGIS in particular - has become the industry standard and is used by a majority of government agencies and private firms engaged in GIS activities. Specifically, employers are seeking professionals armed with a grasp of geospatial data types (vector, aerial imagery, satellite imagery, geodatabases, etc.), spatial analysis techniques and GIS project management skills. My primary goal is to ensure that by completing the course you will possess the theoretical and fundamental GIS skills valued by today's employers. A number of “alumni” from this course and the Online GIS Certificate Program have secured internships and full-time jobs because they demonstrated GIS expertise in their portfolios and at job interviews.

The University of West Florida, Online GIS Certificate Program is run through the Continuing Education Department and hosted by the Environmental Studies Department in conjunction with the GeoData Center, which offers a suite of courses specifically devoted to GIS. Our online courses aim to build sought-after GIS skills through a comprehensive, real world-focused course of study in GIS. The classes are taught mainly as a combined lecture and computer laboratory course using ESRI's ArcGIS 10 software, Adobe Illustrator, remote sensing – ERDAS 10 software and a variety of hands-on exercises and activities. The majority of students interested in completing the certificate typically intend to pursue careers dedicated to the use of GIS while the remainder wishes to learn enough about the technology so it can be one of many tools available to them during their careers or graduate research. As such, the GIS courses offered by the Online GIS Certificate Program are both practical and theoretical in nature. Case studies and the hands-on use of ArcGIS software are favored with a particular focus on the acquisition, conditioning and analysis of real-world geospatial data typically used by GIS practitioners.

The Introduction to GIS course strives to provide a balance between the "how-to" of using ArcGIS 10.1 and the "why" of GIS by explaining the roles GIS technology plays in analyzing local and regional (even global) problems. Major components of the course include computer representation of geographic information, the construction of GIS databases, spatial analysis with GIS, application areas of GIS, and social and management issues that concern GIS. The lecture portion of the course is intended to provide the theoretical underpinnings of GIS while the lab portion of the course is intended to allow the student to put into practice those concepts and techniques described in lecture. At the end of the course, the student is expected to have an understanding of elementary GIS theory, working knowledge of ArcGIS, and the ability to develop GIS-based solutions to geographic modeling and analysis tasks. For most exercises, you will use real GIS data (mostly Florida), “warts and all”, in order to learn how to overcome typical problems encountered by GIS practitioners. The last three weeks of the course will focus on the development, execution and presentation of a final GIS project. Since the visual communication of quantitative data is a vital skill for most GIS industries, this project will help you further develop your GIS skills by framing an urban planning issue, developing a set of high-quality GIS maps to illustrate the
issue, and presenting a focused summary of your methodology and findings to your colleagues.

**Course Goals**

My primary goal is to ensure that by completing the course you will possess the theoretical and fundamental GIS skills valued by today’s employers. A key goal of the final project is to provide you with a portfolio piece to present to current and future employers as evidence of your GIS abilities. There is a lot of work to complete in this course, but I’m here to help you succeed - and we’ll have some fun, too.

**Program Goals**

**Student Learning Outcomes (SLOs)**

Students completing GIS4043 Introduction to Geographic Information Systems with Lab will be able to:

1. Describe how GIS practitioners typically use GIS as a tool for analysis and the display of quantitative data to solve problems
2. Utilize the core components and functionality of ArcGIS 10
3. Describe a variety of geospatial data types, data sources and metadata management techniques
4. Create, manipulate and query geospatial data
5. Symbolize and classify geospatial data, understanding available choices and the implications of each technique
6. Constructively critique cartographic styles and implement effective cartographic and display techniques

**Topics**

1. Introduction to GIS
2. GIS Hardware/Software and Programming
3. Cartography Using a GIS
4. Georeferencing
5. Understanding Map Projections
6. Data for GIS and Data Quality
7. Spatial Data Models and Databases
8. Spatial Analysis of Vector and Raster Data
9. Network Analysis
10. Statistics and Spatial Data Measurements
11. Spatial Analysis of 3-Dimensional Data
12. Final Project
**Texts / Tools**

The required textbook may be purchased online (at sites such as Amazon.com) or directly from the publisher. Note that if you purchase a used textbook online, you are responsible for obtaining the book from the seller in a timely manner. If you are only enrolled in the lab section of this course, you do not need to purchase the text to complete assignments. The text is an excellent resource and will provide background to labs.

**Required Text:**

Title: Introductory Geographic Information Systems

Authors: John R. Jensen; Ryan R. Jensen


Print: ISBN-10 0-13-614776-3

**Required Tools:**

- Internet Access (broadband is recommended)
- Activated UWF ArgoNet E-mail Account
- All students must have access to eDesktop for GIS (software) to participate in this course (access fee included with tuition)

**Fundamentals for Success in this Course**

I will make every effort to help you succeed in this course so that you can use GIS confidently and successfully in your future career endeavors. Naturally, it is your responsibility to complete all assignments and to take advantage of the many learning opportunities this semester. Your final grade will reflect your overall commitment to learning; higher grades correlate with student efforts that exceed expectations. Here are some tips to help you succeed this semester:

- **Maintain a fast pace:** This will be a fast-moving and technologically advanced course, but concepts and instructions will be explained as clearly as possible. If you are coming into this course thinking that online study is a way to "click your way to four credits" then you will be in for a rude awakening. Be prepared to spend a significant amount of time completing this course. Students in previous sessions of this course reported spending between 8 and 10 hours on the typical lesson. A few reported spending a bit more time for challenging lessons. The key to success is self-motivation and perseverance. Set some special work hours every week and stick to them. Learning at home requires much greater dedication than learning on campus. This course allows you great flexibility as long as you meet the inflexible deadlines. You can begin working as soon as the first lesson is posted. Each week you must do enough work to complete one
lesson. The amount of time needed to complete a lesson will vary depending upon the length of the lesson, your reading speed, and your writing ability. If a student wishes to evaluate his or her readiness for this course at the outset, please see me as soon as possible.

- **Computer competencies:** Competence with the Windows XP operating system is expected, including the storing, copying and management of multiple data types; managing multiple windows and applications; and techniques for saving work frequently. Familiarity with data entry, sorting, editing and report generation using Microsoft Excel is also expected.

- **Enjoyment of Learning:** A strong motivation to learn, explore and have fun with computer applications is essential. This course will require a significant amount of independent work and relies heavily on student initiative.

- **Seek Help Effectively:** Since GIS practitioners are problem-solvers at their core, it is important that you adopt a problem-solving mindset in this course. Asking for assistance this semester is encouraged and signals to me that you are engaged in your work, motivated by excellence and effectively challenged by the assignments. Asking for help will never be perceived as a liability in my class. However, when seeking assistance, it is important for you to (1) clearly communicate the problem and (2) demonstrate that you have attempted to solve the problem on your own and are ready to clearly articulate your attempts. ArcGIS Help is quite extensive – I strongly encourage you to seek help here first for related questions. I am very happy to help you with your work during office hours or via email. If we work together via email, it is vital that you send me as much information as possible to help diagnose the problem, including your name. It is not sufficient to write to me and vaguely state, “I can’t get this to work” and expect useful assistance without also including relevant screen captures and a description of the solution steps you’ve tried. In general, I will be very responsive to queries that meet these criteria and much less so for “lazy queries”, which I probably will not have time to address. This approach mirrors professional practice since supervisors expect valued employees to be proactive in solving problems.

- **Focus and Respect:** Two basic components of this course need to be addressed in regards to focus and respect, eDesktop for GIS and course discussion board or email.

**eDesktop for GIS**

Out of respect for everyone in a focused learning environment and to ensure no infringements of our software licenses, reserve eDesktop for GIS use for educational and course related purposes. The number of students accessing the server (no matter the activity) directly affects the amount of server bandwidth and processing power allotted to each student. Limiting non-course related activities on GIS servers will benefit all.

**Course Discussion Board and Email**
Staying on topic in our course discussion forums will enable classmates and instructors to find information needed quickly. In order to get the most out of this experience, it is important to use the Internet and email responsibly. Respectful communication with others is indispensable. A dedicated PDF explaining netiquette is included with orientation materials to help ensure students are aware of how the written word can be perceived differently as well as how to ensure your written message is communicated without ambiguity or disrespect. My personal advice it to write as if you are speaking to the intended audience in-person. When heated or frustrated, wait until you’ve calmed down before creating a post or email.

Professional Conduct

I conduct this course in a manner that mirrors professional practice in order to foster valuable workplace skills. We all need to be in agreement that the following standards will apply:

Instructor Responsibilities

- To create a physically and intellectually safe and stimulating environment for learning
- To assist students as much as possible with their individual and collective learning goals
- To help resolve conflicts that hinder learning by answering student questions clearly and promptly, or to research answers and reply to the student as soon as possible
- To treat students with respect and kindness, using encouragement and humor to foster learning
- To arrive prepared and organized, with clear learning objectives and a schedule for each class period
- To evaluate and grade student work fairly and accurately while providing constructive feedback

Student Responsibilities

- To attend each class session and to arrive punctually, bringing all needed materials
- To treat other students and the instructor with absolute respect, supporting fellow students whenever possible with their learning objectives, and minimizing distractions in class
- To complete all assignments on time and professionally according to requirements listed in this syllabus
- To fully read and understand all aspects of this syllabus and to carry out the requirements therein
- To actively and consistently participate in class discussions and question-and-answer sessions
- To demonstrate self-reliance and self-direction in setting and completing learning objectives
- To accept responsibility for working collaboratively in the learning process
Module/Lesson Availability and Due Dates

All lessons will be posted at least one week prior to the due date and you may begin working on a lesson as soon as it is posted. New lessons in this course will open every Monday with associated deliverables/assignments due on the following Thursday before 11:59 p.m. unless otherwise noted in the course schedule.

Special Note: Because students in this course are from multiple time zones it is impossible to honor the time table of each different zone. The schedule will apply to the U.S. Central Time zone (for Pensacola, FL) regardless of the time zone you live in/work from. It is up to you to figure out the time difference for your specific location. If you plan to be away from your studies at any time or while on vacation, it is your responsibility to work ahead and be certain that you meet the posted deadlines. Various time zone converters are available on the web. Example: http://www.timeanddate.com/worldclock/converter.html

Grading / Evaluation

Orientation: 5%
Participation: 5%
Quizzes: 35%
Weekly Laboratory Exercises: 35%
Final Project: 20%

Letter grades will be assigned as follows: (edit to fit your grading scheme)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>94% or better</td>
</tr>
<tr>
<td>A -</td>
<td>90% to 93%</td>
</tr>
<tr>
<td>B +</td>
<td>87% to 89%</td>
</tr>
<tr>
<td>B</td>
<td>83% to 86%</td>
</tr>
<tr>
<td>B -</td>
<td>80% to 82%</td>
</tr>
<tr>
<td>C +</td>
<td>77% to 79%</td>
</tr>
<tr>
<td>C</td>
<td>73% to 76%</td>
</tr>
<tr>
<td>C -</td>
<td>70% to 72%</td>
</tr>
<tr>
<td>D</td>
<td>60% to 69%</td>
</tr>
<tr>
<td>F</td>
<td>50% or less</td>
</tr>
</tbody>
</table>

Completing Assignments on Time and Professionally

Since this course focuses on the development of professional skills, the presentation of submitted materials will be considered as part of the assignment’s grade. All assignments must include the student’s name, date, assignment name and other items as directed by the instructor. Neatness, clarity and organization do count. Assignments are due at the date and time specified in the course schedule. I realize that life happens. Please see the late assignment policy below.

Late Assignments

All assignments (quizzes, labs, participation assignments) are to be turned in on the close date of that module. All modules will close at 11:59 pm on Thursday, the
week after the module opens unless stated otherwise in the course schedule. However, in the case of a personal, family or work emergency you may make a request for an extension by emailing the Instructor and GA ahead of time (if possible). Before requesting an excused absence, please review the UWF student handbook regarding the topic [UWF Student Planner and Handbook](#).

Unexcused lab assignments may be accepted late, but will be given a **25% reduction off the grade**. This means that the highest grade possible is a C. It is very important to complete all lab assignments, as the skills and techniques learned each week are likely to be used again later. A late dropbox is provided and will remain open until **11:59pm on April 18th, 2013**. Late items will be graded by the end of the term.

The opportunity to make-up one quiz (your lowest, unexcused, quiz grade) is provided on **May 3rd, 2013** is granted to all students.

**How to address common issues:**

- **Work-related absence:** If you are going to be out of town for work related reasons and without constant internet access, email the Instructor in advance so materials and access to quizzes can be provided. Without prior notice, late work will be penalized.

- **Your weekly project is late due to computer problems:** We provide many different avenues in order to address any technical issues that you may have when completing your assignments. The sooner you make the instructor and GA aware of any computer issues, the sooner we can assist you in resolving them. Weekly projects accepted without penalty due to computer related issues will be left up to the discretion of the instructor.

- **You forget to take a quiz:** take the make-up quiz provided at the end of the semester

- **Your quiz is unsuccessful because of a computer problem or human error:** email your instructor to make sure it's not an elearning issue. Be prepared to take the make-up at the end of the semester.

- **Two or more of your quizzes are missed or unsuccessful:** take a make-up quiz to replace the first quiz score. Other missed or unsuccessful quizzes will receive a score of zero.

*Communication is key to doing well in this class. If you are having trouble keeping up with assignments, please contact your instructor or the GA sooner rather than later!*

**Orientation**

An extensive orientation (including a quiz) has been provided for you to become acquainted with the online learning environment and course components and requirements. Your first lab exercise will introduce you to eDesktop for GIS, ArcGIS software, how to submit items for grade, how to earn the highest grade possible and how to get retrieve feedback. Completing the orientation is important to your success in this class, which is why it is included as a graded item. Please be sure to complete all tasks outlined in the course content under “Orientation Materials” to receive full credit. With the beginning of the first lecture and lab, students will be prompted to agree they
have studied and have completed all orientation tasks before proceeding. This way, instructors will be assured that students are all on the same page going forward.

**Attendance and Participation**

Student attendance and participation in class (accessing the course and discussions) is a vital component of this course and students should make every attempt to actively participate by visiting the course site on a weekly basis and contributing to class discussions. In cases where a student does not visit the course site on a regular basis, doesn’t spend a significant amount of time viewing course materials or does not actively participate in discussions, this will impact the final course grade.

The participation component of this class will be assessed through graded participation assignments and weekly blog posts. There will be at least two occasions where I will assign a graded discussion post. The required post may be a written summary pertaining to additional readings or written results from a weekly project. Posts must be well written using proper grammar, spelling, etc.

Each lab includes a participation percentage for posting to your blog, which will count towards the final “Weekly Laboratory Exercise” grade. Though, keeping an updated blog will certainly help your final “Participation” grade.

Your GIS Portfolio Requirement: Students will be required to create a GIS Portfolio in the GIS Internship course during the final semester of the GIS Certificate program. Blog posts you create each week (for every course) will help you create a complete portfolio showcasing your skills and best works. For this reason, it’s important to make your blog posts descriptive, professional and easy to understand.

**Course Lecture and Quizzes**

**Weekly Quizzes**

Each weekly set of readings will include an associated quiz testing mastery of the material.

Quizzes are administered in the eLearning course website. Quizzes can be taken at any time before the Thursday due date of each Module (see course assignment schedule for specific dates). I provide two attempts on reading quizzes in this course. The highest grade will automatically be recorded on the grade book.

**Tips:**

- Review the quiz guide and/or the student resource website provided with the required text.
- You should take your quizzes on a reliable, freshly restarted computer with only one window open. This will minimize the possibility of computer crashes or freeze-ups during the quiz.
- After your quiz is complete, you may view results by going to the Quizzes link once again and selecting the appropriate quiz under the “Past Quizzes” section.
• Your grade will automatically be posted to the Grades link in most instances (hand-grading by your instructor may be necessary at times).

**Weekly Laboratory Exercises**

Laboratory exercises are designed to help you become familiar with ArcGIS 10.1 Desktop tools, functions and basic analysis capabilities in order to solve real-world problems. Any background information, resources or related case-studies will be provided within the lab or as a separate document. Important information including related topics, where to find data and deliverables required for grade will be included at the top of every lab exercise. A custom rubric outlining how instructors will grade your submission has been created for each exercise and will be included within the course content as a separate link listed just below the link to lab instructions. Note: It’s recommended that you complete lecture materials and assignments before attempting lab but, not all lecture and lab topics will mash-up. Do not expect lab assignments to directly correspond with lecture materials.

The Weekly Project drop box closes on the Thursday due date at 11:59pm central time (see course schedule).

**Final Project**

The final project for this course puts you in the seat of a GIS analyst – working for a consulting firm hired by Florida Power and Light (FPL), an energy company. We’ll pretend FPL has hired your consulting firm to assist with right-of-way acquisition for the proposed Bobwhite-Manatee transmission line route crossing Manatee and Sarasota county lines in Florida. Bobwhite-Manatee Transmission Line Project is an actual FPL project being completed for Manatee and Sarasota counties. The survey and right-of-way acquisition phase of the project was completed in 2009, which is the portion we will focus on for the project in this class. Our class project takes a scaled down, guided and somewhat generalized approach to FPL project which is divided in to three basic phases – week 1: background phase, week 2: GIS analysis phase and week 3: presentation phase.

The basic objectives for the project are to define:

- Homes within proximity of the transmission line
- Schools within proximity of the transmission line
- Imposition of the transmission line on communities, land owners or parcels, and environmentally sensitive lands.
- Length of the transmission line (related to engineering/cost).

The final output will consist of a map book/power point presentation accompanied by written or oral narration. I may require specific maps, graphs, or final calculations, but it is up to students to present and explain outputs/conclusions in a way that a lay (untrained) audience will understand. Students are expected to incorporate lessons and techniques learned throughout the course to create professional quality maps and
outputs. A Google map site may be included as part of the final requirements (detailed instructions will be provided).

The final project will summarize all the material that you will have been exposed to during the semester to include: the project/presentation and a 20 question exam derived from course lecture material and laboratory concepts. Expect detailed information when the project material is scheduled to open. This project is a great introduction to more complex assignments that you will assigned during the certificate program. I will be providing some assistance with this project. This will be turned into the Final Project drop box and your blog by **May 2nd, 2013 by 11:59 p.m.**

*Students must agree to check email through Monday, the 6th to receive instructor confirmation of successful retrieval (in case of any problems with accessing deliverables).

**Minimum Technical Skills and Special Technology Utilized by Students**

This course is totally online. All instructional content and interaction takes place over the WWW. In addition to baseline word processing skills and sending/receiving email with attachments, students will be expected to search the internet and upload / download files. In addition, students may need one or more of the following plug-ins:

- Real Player: [http://www.real.com/realplayer/search](http://www.real.com/realplayer/search)
- eLearning's Accessibility Resource Guides for users: [http://www.desire2learn.com/access/resources/](http://www.desire2learn.com/access/resources/)

**Expectations for Academic Conduct / Plagiarism Policy**

Academic Conduct Policy: [Web Site](http://Web Site) | [PDF Format](http://PDF Format)  
Student Handbook: [PDF Format](http://PDF Format)  

**Assistance for Students with Disabilities**

The [Student Disability Resource Center (SDRC)](http://Student Disability Resource Center (SDRC)) at the University of West Florida supports an inclusive learning environment for all students. If there are aspects of the instruction or design of this course that hinder your full participation, such as time-limited exams, inaccessible web content, or the use of non-captioned videos and
Accessibility Resources

- Follow this link for information on accessibility settings in eLearning.
- Follow this link for information on accessibility features in UWF’s Learning Management System (LMS), Desire2Learn.

TurnItIn

UWF maintains a university license agreement for an online text matching service called TurnItIn. At my discretion, I will use the TurnItIn service to determine the originality of student papers. If I submit your paper to TurnItIn, it will be stored in a TurnItIn database for as long as the service remains in existence. If you object to this storage of your paper:

1. You must let me know no later than two weeks after the start of this class.
2. I will utilize other services and techniques to evaluate your work for evidence of appropriate authorship practices.

Weather Emergency Information

In the case of severe weather or other emergency, the campus might be closed and classes cancelled. Official closures and delays are announced on the UWF website and broadcast on WUWF-FM.

- WUWF-FM (88.1MHz) is the official information source for the university. Any pertinent information regarding closings, cancellations, and the re-opening of campus will be broadcast.
- In the event that hurricane preparation procedures are initiated, the UWF Home Web Page and Argus will both provide current information regarding hurricane preparation procedures, the status of classes and the closing of the university.

Emergency plans for the University of West Florida related to weather or other emergencies are available on the following UWF web pages:

- Information about hurricane preparedness plans is available on the UWF website: http://uwfemergency.org/hurricaneprep.cfm
- Information about other emergency procedures is available on the UWF website: http://uwfemergency.org/

Odds and Ends

Adds/Drops
The student is responsible for understanding the policies and procedures about add/drops, academic renewal, withdrawal, etc. found at UWF Campus Calendar.

Students who add the class after the first day of class are responsible for completing all work in the course on the same schedule as students who were registered from the first day of the semester.

**Incomplete Grade**

An incomplete grade will only be assigned for a documented, serious, non-academic reason.

**Level of Effort**

This course requires approximately 10 hours of work per week. Students should expect to spend slightly more time per week for long-term projects such as the final course project.