-- GEOG 310 --

Introduction to Computer Mapping and GIS

4 credits -- Fort Lewis College -- Fall Semester 2018

Course Information

Time & Location: Lecture: 9:35-11:00 am Tu and Th, Berndt 234; Lab: 2:30 - 5:30 pm Tu or Th, SFH 2771

Instructor: Scott White, PhD contact: *white_s@fortlewis.edu* or 247-7475

office: SFH 2794 office hours: M and Tu and W, 12:00-2:00 pm, or by appointment

Class and lab information and documents are available through Canvas at https://courses.fortlewis.edu.

Required Textbook (on reserve in Reed Library)

- *Introductory Geographic Information Systems*, by John R. Jensen and Ryan R. Jensen, ©2013 Pearson Education (ISBN 978-0-13-614776-3). The textbook is available from the Fort Lewis SkyStore. Visit the store in-person or login to Canvas (https://courses.fortlewis.edu, and click the SkyStore link) to order print, rental, or eText versions.

Course Description and Learning Outcomes

In this class, you will be introduced to the study and design of maps, primarily through the application of a specialized mapping software program known as a **Geographic Information System (GIS)**. GIS is a map-based computer decision support system that allows for the investigation of geographic data relationships. People that are trained in GIS are in high demand today, both in government and private industry. The lecture sessions in this class will focus primarily on GIS-based mapmaking techniques, including map design, symbology, map coordinates and georeferencing systems. We will cover many important aspects of mapmaking, including map data collection and processing, field methods and GPS, cartographic communication, topographic map reading and analysis, and qualitative and quantitative mapping techniques. Hands-on "laboratory" exercises will deal primarily with the design and creation of maps using GIS software. The bulk of the lab assignments will use ArcGIS for Desktop 10.6.1, but you will also gain some familiarity with a web browser-based GIS program called ArcGIS Online. Many of the lecture topics and lab assignments will examine the application of GIS to mapping and problem-solving in the natural and physical sciences.

There are no prerequisites for this course, however it is expected that you have some basic high school-level competency in geometry and algebra. Also, a good understanding of Windows-based computers, or at least a willingness to understand, is *strongly* recommended for success and happiness with GIS.

Major learning outcomes in this course include (1) introductory-level competency with GIS software, (2) the ability to create professional map output using GIS, and (3) the ability to use vector and raster data in GIS software.

Grades and Assignments

Grading follows the typical A, B, C, D, and F scheme, with + and – counting towards your final course grade:

A = 93-100	B+ = 87-89	C+ = 77-79	D+ = 67-69	F = < 60
A- = 90-92	B = 83-86	C = 73-76	D = 63-66	
	B- = 80-82	C- = 70-72	D- = 60-62	

Your course grade will be based on …

- 4 Lecture Exams. These will consist of a mix of multiple choice and short answer/essay questions. Each exam will count toward approximately **10%** of your final course grade (**40%** total). See the schedule on page 3 for exam dates.
- 12 GIS Lab Exercises and 1 Homework Assignment. A series of GIS and related mapping lab exercises will be assigned during the semester. A composite lab and homework assignment score will be scaled to 100 and will count toward **60%** of your final course grade. For more information on labs, refer to the lab policies listing on page 2 and the schedule on page 3.

GEOG 310 and Fort Lewis College Information and Policies

The Lectures

- Make-up exams or lab assignments will only be permitted if you have (in my opinion) a valid excuse. Whenever possible, talk to me before you miss class or lab. Make-up exams may be different from those given to the other students, and may consist totally of short answer and/or essay questions. Individual exam grades *are not curved*, but final course grades may be adjusted at the end of the semester. Exam #4, held during finals week, is *not* comprehensive.
- No extra credit assignments will be offered, although extra credit points may appear on some exams.
- If English is not your primary language, you may use a dictionary during the exams. Discuss this with me first.

The Labs and ArcGIS Software

- Officially, the GIS lab runs from 2:30 to 5:30 pm on Tues. or Thurs. Unofficially, I will expect you to be working on your GIS lab assignment in the lab from 2:30 to 4:30 pm. On most lab days, you may leave after 4:30 pm if you wish, but I will stay in the computer lab until 5:30 pm. It is highly recommended that you stay for the entire 3-hour period.
- Lectures and lab sessions are not interchangeable with the other GEOG 310 lectures and labs taught this semester. You should only attend the lectures and labs for which you have registered.
- Lab assignments are due at the start of the next lab period, or earlier, unless I indicate otherwise. Unless prior arrangements have been made with me, late lab assignments will docked 50% for a 24-hour period after the due date. Turn in your lab assignments on time*!*
- Much of the lab work can be finished during the 3-hour time period; however, most lab exercises will require you to spend time with GIS outside of the normal lab hours.
- The ArcGIS software should be installed in all campus computer labs with machines running the Windows 10 operating system. Specific hours for the SFH 2771 computer lab should be posted outside of the room.
- ArcGIS Desktop 10.6.1 software is available to FLC GIS students as part of our campus-wide site license. If you are interested in the software for your home computer, first check the system requirements at http://tinyurl.com/ArcGISSR. Contact me by email to receive an authorization code and software installation info.

Responsibility and Honesty

- You are responsible for all materials presented during class and lab. I will not regularly record your attendance, but it is definitely in your best interests to come to each class since the exam questions will come primarily from the lecture notes. Lecture notes and key PowerPoint slides will be posted online, but you should come to class and take notes so that you know that you are aware of the significant topics. The last day to drop this class without a recorded grade is Tuesday, September 11 (Census Date). It is your responsibility as a student to ensure that you are properly enrolled in this course. It is not possible to add courses after the Census Date. Login to https://webopus.fortlewis.edu to verify your enrollment status.
- Students with disabilities have equal access and equal opportunity in this course. If you require reasonable accommodations to fully participate in course activities or meet course requirements, you must register with Disability Services, Noble Hall room 280, phone: 247-7383. If you qualify for services, bring your letter of accommodation to me as soon as possible. See https://www.fortlewis.edu/disability for more information.
- Cheating and plagiarism will *not* be tolerated, and may result in a zero score on the assignment in question, a final course grade of F, and/or referral to the Associate Vice President for Academic Affairs. I expect that all students will abide by the FLC Student Conduct Code as described in the FLC Student Handbook.

Courtesy

☑ Please turn off your mobile phone, or set it to vibrate, before entering the classroom and computer lab. No texting allowed during class and lab. Be considerate of your fellow students and your professor.

☑ If you wish to use a laptop or tablet computer to take class notes, that's OK. Facebook, Twitter, and other forms of social media, that's not OK. Do that on your own time outside of this class.

☑ I expect you to be on time to the lecture starting at 9:35 am, and to remain in class for the full 85 minutes. Unless you are sick, please do not disrupt the class by randomly leaving and then reappearing.

☑ *Thank you!* ☺

GEOG 310 Lecture and Lab Schedule

[This schedule is subject to change.]

[Textbook Readings: *IGIS* = *Introductory Geographic Information Systems*]

Dates	Tu Th Lectures, ***Tu Th Labs***	Text Readings
8/28, 8/30	Intro to GIS, Maps, Definitions, and Spatial Data Formats; ***"Geospatial Revolution" vid*** (***homework***) ***Lab 1 - Exploring Maps and Atlases - Paper and Digital *Meet in Reed Library at 2:30 pm****	*IGIS* 1 (pp. 1-20)
9/4, 9/6	Mapmaking and Cartography; Map Design Basics; Historical Cartography (CSWS Delaney Library) ***Lab 2 - Working with Geographic Data in ArcGIS 10.6.1***	*IGIS* 10 (pp. 279-287)
9/11, 9/13	Map Design Fundamentals; Feature Types and Attributes ***Lab 3 – Map Data Prep, Map Design, and Map Layout***	*IGIS* 10 (pp. 287-295)
9/18, 9/20	Data Measurement Levels; Typography (Fonts) and Colors on Maps; EXAM #1 (Th 9/20) ***Lab 4 - Working with Digital Vector and Raster Data Sets***	" "
9/25, 9/27	Georeferencing (Earth's Shape; Spherical Coordinate Systems) ***Lab 5 - Exploring Map Projections and Coordinate Systems in ArcGIS***	*IGIS* 2 (pp. 25-51)
10/2, 10/4	Georeferencing (Grid Coordinate Systems and Land Partitioning); GPS and Geocaching ***Lab 6 - Navigation and Mapping with GPS and Google Maps***	*IGIS* 3 (pp. 55-69)
10/9, 10/11	Surveying, Sampling, and Digitizing; Accuracy and Precision, Errors, Uncertainty, and Metadata ***Lab 7 – Datg Collection and Mapping with GPS and GIS***	*IGIS* 3 (pp. 70-76) *IGIS* 4 (pp. 107-120)
10/16, 10/18	EXAM #2 (Tu 10/16); Topographic Mapping and the U.S. Geological Survey (USGS) ***Lab 8 - Map Analysis Using Paper and Digital USGS Topographic Maps***	readings TBA
10/23, 10/25	Relief Portrayal; GIS Datasets from the USGS ***Lab 9 - 2-D and 3-D Terrain and Image Mapping***	*IGIS* 10 (pp. 301-305)
10/30, 11/1	Remote Sensing: Aerial and Satellite Imagery ***Lab 10 - Working with Aerial and Satellite Imagery***	*IGIS* 3 (pp. 76-94) *IGIS* 10 (pp. 313-317)
11/6, 11/8	Mapping and Symbolizing Qualitative Data; EXAM #3 (Th 11/8) ***Lab 11 - Mapping and Symbolizing Qualitative Spatial Data***	*IGIS* 10 (pp. 296-301)
11/13, 11/15	Mapping and Symbolizing Qualitative Data (cont'd) ***Lab 11 (continued): Mapping and Symbolizing Qualitative Spatial Data***	*IGIS* 10 (pp. 306-313)
11/20, 11/22	***T H A N K S G I V I N G B R E A K ! ! !***	
11/27, 11/29	Mapping and Symbolizing Quantitative Data ***Lab 12 - Mapping and Symbolizing Quantitative Spatial Data***	
12/4, 12/6	The Future of GIS and Geospatial Technologies ***Lab 12 (continued) - Mapping and Symbolizing Quantitative Spatial Data***	*IGIS* 12 (pp. 339-358)
12/11	EXAM #4 (Tu 2:15-4:15 pm)	

The Fort Lewis College Department of Geosciences offers a Certificate in GIS. The Certificate program consists of four core GIS courses, an engineering surveying or remote sensing course, and a capstone independent study or internship. Students who successfully complete the requirements for the program receive a certificate of completion, and (most importantly) a statement on the official college transcript indicating the completion date. The current course listing is below. For more information, see the GIS Certificate web page at https://www.fortlewis.edu/geosciences/AboutOurProgram/GISCertificate.aspx, or contact the GIS Certificate Coordinator, Dr. Scott White (*white_s@fortlewis.edu*).

Requirements for the Certificate in Geographic Information Systems:

For course descriptions and prerequisites, refer to the current Fort Lewis College Catalog of Courses (https://catalog.fortlewis.edu).

Required GIS Courses (4)	Credits
GEOG 310 Intro to Computer Mapping and GIS [taught Fall and Spring semesters]	4
GEOG 315 GIS Programming and Web Mapping [taught Spring semester]	2
GEOG 350 Intermediate GIS [taught Spring semester]	3
GEOG 400 Advanced GIS [taught Fall semester]	3

Prerequisite for GEOL 325 Intro to Remote Sensing (Choose 1)

GEOL 105 Earth and the Environment [taught Fall and/or Spring semesters] or	4
GEOL 107 Earth Systems Science [taught Fall and/or Spring semesters] or	
GEOL 113 Physical Geology [taught Fall and/or Spring semesters] or	

Prerequisite for ENG 205 Intro to Geomatics and Engineering Surveying (1)

Math 121 Pre-Calculus [taught Fall and Spring semesters]	4

Remote Sensing, Engineering/CAD, and Surveying (Choose 1)

GEOL 325 Intro to Remote Sensing [taught Spring semester] or	4
ENG 205 Intro to Geomatics and Engineering Surveying	4
[taught every even-year Fall semester]	

GIS Capstone Course (Choose 1)

GEOG 480 Internship in GIS* or	1, 2, or 3
GEOG 499 Independent Study*	1, 2, or 3

* Credits for GEOG 480 and GEOG 499 may occur during the Fall, Spring, or Summer semesters. Students choose 1, 2, or 3 credits; the minimum is 1 credit for the GIS Certificate. Planning ahead is essential for both GEOG 480 and 499. All GEOG 480 internships or GEOG 499 independent study projects must be approved by a GIS Certificate faculty member prior to registration. For GEOG 480, contact Dr. Scott White for more information. For GEOG 499, contact Dr. Scott White, Dr. Mickey Campbell, or Dr. Jon Harvey for more information.

Total Required Hours for GIS Certificate = 21, 22, or 23 credit hours