

**EARTH AND ENVIRONMENTAL SCIENCES (GEO) 1710/3710:
INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS (GIS)
FALL SEMESTER 2019**

NOTE: Dual-listed courses: **Lower-division (blue)** and **upper division courses (green)** are color-coded to indicate unique information related to each course.

Meeting Time: T, R 9:00 am – 10:15 am (Lecture)
T 1:30 pm – 4:20 pm (Lab)
Location: Tracy Hall Science Center (TY 127) –
Computational Lab

Instructor: Michael W Hernandez, Ph.D.
Department of Earth and Environmental Sciences
Phone #: (801) 626-8186
Office: TY 334
Communication: **WSUOnline – Canvas messaging system (preferred)**
mhernandez@weber.edu (alternate)
Office Hours: TR: 10:30 am – 11:45 am OR by appointment

REQUIRED MATERIALS

**PRICE, MARIBETH, (2020) MASTERING ARCGIS PRO. NEW YORK: MCGRAW HILL.
ISBN: 9781260587371 (LOOSE LEAF)**

** you can purchase e-text or combo e-text/loose leaf as well

ADDITIONAL MATERIAL

There will be additional readings assigned by the instructor throughout the semester.

COURSE DESCRIPTION & OBJECTIVES

- This introductory course presents the fundamental concepts and applications of Geographic Information Systems (GIS). You will learn how to evaluate and apply geospatial concepts using an industry-leading GIS software suite to create, store, edit, evaluate, and query raster- and vector-based geospatial data. Successful completion of this course will result in you attaining the critical knowledge and skills needed to be a competent GIS user. You will also be prepared to learn advanced geoprocessing operations supporting geospatial analysis and modeling techniques presented in the advanced GIS course.
- *The specific objectives of the course are:*
 - 1) Understand the fundamentals of GIS.
 - 2) Identify how GIS is used to answer geospatial-related questions.
 - 3) Develop critical thinking skills about how GIS concepts/operations are used to create, store, edit, and query spatial data.
 - 4) Demonstrate geospatial skills learned in the labs by accomplishing geoprocessing operations on real-world data.

STUDENT LEARNING OUTCOMES (SLOs)

By the end of the course, students are expected to:

1. Remember and understand the fundamental concepts about geospatial technology (i.e., GIS), including reasons for its rapid acceptance as an important component in a variety of studies across numerous areas in the marketplace.
2. Understand key aspects related to the various types of spatial data.
3. Understand and apply raster and vector data models.
4. Understand, apply, and analyze map coordinate systems for geospatial data.
5. Understand, apply, evaluate, and create geodatabases.
6. Understand, apply, analyze, evaluate, and create geospatial data (features and attribute tables).
7. Understand, evaluate, and create metadata.
8. Understand, apply, analyze, and evaluate data exploration methods such as queries, joins/spatial joins, and relates.
9. Apply multiple concepts and software operations learned in SLOs 1 – 8 to work with geospatial data and investigate a geospatial problem.

PREREQUISITE / COREQUISITE:

- GEO 1710: GEOG 1890 (prerequisite or corequisite)
- GEO 3710: none

LAB FEES

- \$50
- The fees in this course are used to purchase expendables such as printer paper and color printer cartridges used for student printing in the lab. The remaining funds are pooled with funds from other courses to help pay for nonexpendable items such as annual software license fees (e.g., ESRI ArcGIS, ENVI, Trimble, etc.) and replacement of computer workstations / other equipment.

COURSE POLICIES

Expectations: This is a **4-credit hour, scientific and technical course with a major lab component**. Students are expected to spend 5 hours in class and an additional 8 to 12 hours per week outside of class on related course requirements (e.g., reading, completing lab assignments, reviewing lecture notes). This course focuses on developing your critical thinking skills through thought-provoking lab exercises, a final project, and exams. You are expected to spend time studying and understanding how the concepts discussed in this course impact the geospatial data created, used, and stored in a GIS. While I will teach you and guide your learning when necessary, I will not just give you the answer to a question. My intent is to help you further develop your knowledge and analytical skills you will gain confidence in your ability to organize projects and address challenges once you reach the work force.

Attendance: Regular attendance is **required**. You should be in the classroom prepared to begin work when class starts, as well as stay for the entire class period. The majority of test material and lab exercises will be presented in class. Therefore, it is important to attend all classes. You must have a valid excuse with documentation to make up exams

or avoid grade penalties on late exercises and projects. Consideration for borderline grades will be given based on attendance and class participation. There will be **NO EXTRA CREDIT ASSIGNMENTS or MAKE UP EXAMS** (without a valid excuse) given in the course.

Classroom Conduct: All phones must be turned off in class or in silent mode. As a courtesy to fellow classmates, please do not sleep during the lecture or hold conversations with classmates whenever the instructor or a student is speaking. These are distracting for both the instructor and class. If you must leave early, please inform me prior to the beginning of class. **You are responsible for obtaining class notes and labs from fellow students if you miss class.**

Methods of Evaluation: Grades are based on overall performance, measured by the scores earned from **exams, lab exercises, and a final project** assigned during the semester. This course will use the standard +/- grade scale in accordance with university policy. Final grades will be awarded using the following percentage scale that is based on the total number of points earned divided by the total number of available points.

A	93.0+%	B-	79.0-81.9%	D+	66.0-68.9%
A-	89.0-92.9%	C+	76.0-78.9%	D	63.0-65.9%
B+	86.0-88.9%	C	72.0-75.9%	D-	60.0-62.9%
B	82.0-85.9%	C-	69.0-71.9%	E	<60.0%

2 Exams (30% of grade)
12 Labs (50% of grade)
1 Final Project (20%)

Upper Division Course Credit Requirements

This is a **dual-listed course** where lower division or upper division credit is earned with successful completion of the course, earning a grade of C or better. **Students enrolled in the upper division section of the course will have additional requirements that demonstrate a higher level of learning** on **labs** (e.g., *challenge problems*), **exams** (e.g., *essay questions*), and **the final project** (i.e., *different project with more comprehensive objectives*).

Methods of Instruction: Instruction may include, but not limited to, the following methods:

- Lecture / Discussion
- Learning Modules (online)
- Audio-Visual Material (e.g., online videos)
- Active/Collaborative Learning
- Computer Assisted Instruction
- Lab Exercises

Lab/Class Exercises: You will be given lab exercises throughout the semester to teach specific topics relevant to effectively using a GIS. You will attain a working knowledge of the capabilities and limitations of a GIS that will allow you to perform basic operations as well as prepare you to learn more advanced GIS topics.

The lab exercises will be completed during and outside of the lab. The **Rules and Regulations** for the lab will be reviewed the first week of the semester. This review will also include procedures on when/how you can access the lab.

LATE ASSIGNMENTS ARE THOSE NOT TURNED IN AT THE BEGINNING OF LAB ON THE DUE DATE. Late assignments without a valid reason will not be accepted/graded and will receive a score of 0.

Final Project: The objective of the final project is to provide you with practical experience using commercial, professional-grade GIS software. More information on the projects will be provided during the semester. Important dates are listed on the calendar.

Exams: The exams will encompass all material presented in the lectures, readings, and lab exercises. They will include a **WRITTEN Component**: definitions, short answer, essay questions, and a **LAB Component**: scenario-based problem where you will complete a series geoprocessing operations that produce a desired outcome . Make-up exams will only be given in special circumstances where the student has a valid university excuse or other legitimate reason provided they can present an acceptable signed note. Students must reschedule an exam prior to the exam date if they know they will not be able to take the exam during the scheduled class period.

Support Services for Students with Disabilities (ADA): Any student requiring accommodations or services due to a disability must contact [Services for Students with Disabilities \(SSD\)](#) in room 181 of the Student Service Center. SSD can also arrange to provide course materials (including this syllabus) in alternative formats if necessary. Contact them via phone at (801) 626-6413.

Academic Honesty: Every student should understand and adhere to WSU policies with regard to academic integrity and the consequences of violating such rules ([see Student Code, Section IV: D](#)). Academic honesty is fundamental to the university mission of both teaching and research. All members of the academic community must be confident that each person's work has been properly acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest. The academic community regards academic dishonesty as an extremely serious matter, and will result in a score of 0 for the assignment/exam, reduced grade in the course and further university disciplinary action according to the [Student Code, Sections IV:D and X:A & B](#).

Academic dishonesty includes but is not limited to the following:

- Cheating
- Plagiarism
- Collusion
- Unauthorized possession of exams or reserve library material
- Falsification of grades on exams, instructor's grade book, or other grade records
- Copyright infringement

Remember, when in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult me or other faculty member for guidance.

College of Science Learning Skills Services

Brian Pilcher, learning strategist in the College of Science, can help you with learning skills such as time management, study methods, test taking, and test anxiety. He is located in TY 201D, but appointments are the surest way to see him. Make an appointment at <https://brianpilcher.youcanbook.me>. Other ways to contact him are 626-6110 and BrianPilcher@weber.edu. He will also offer learning skills workshops. You can find the [current workshop schedule here](#).

Instructor Method of Contact Due to an Emergency: If class or lab is canceled (e.g., faculty illness, emergency – university code purple, weather-related campus closure, etc.) I will contact you via WSU Online email message (i.e., Canvas) as the **first option** OR WSU email system as **second option**, with class-related information as soon as I am able to get online. If you have questions, contact the Department of Earth and Environmental Sciences at 801-626-7139 or university information at 801-626-6000.

Important Dates:

- 11/05/19 Last day to withdraw from a course without a grade
- 11/28/19 – 11/29/19 THANKSGIVING BREAK
- 12/06/19 Fall Semester class work ends
- 12/06/19 **Final projects DUE (WSUOnline Canvas upload: 11:59 pm MST)**

Tentative schedule (as of August 25, 2019), schedule subject to change. Changes in ORANGE

Week	Date	UNITS	SLOs (number)	Labs Due
1	26 Aug – 1 Sep	Syllabus Review UNIT 1: Introduction to Geospatial Technology/GIS (Price: Introduction)	1	
	27 Aug	Lab 1:		
2	2 – 8 Sep	UNIT 2: Understanding Spatial Data (Price: Ch. 1 – What is GIS?)	2	
	3 Sep	Lab 2:		Lab 1
3	9 – 15 Sep	UNIT 3: Displaying/Presenting Spatial Data (Price: Ch. 2 – Mapping GIS Data)	2	
	10 Sep	Lab 3:		Lab 2
4	16 – 22 Sep	Cartographic Process (Price: Ch. 3 – Presenting GIS Data)	4, 6	
	17 Sep	Lab 4:		Lab 3
5	23 – 29 Sep	Map Coordinate Systems (Price: Ch. 4 – Coordinate Systems)	4	
	24 Sep	Lab 5:		Lab 4
6	30 Sep – 6 Oct	UNIT 4: Managing Your Geospatial Data (Raster & Vector Data Models) (Price: Ch. 5 – Managing Vector Data)	3	
	1 Oct	Lab 6:		Lab 5

7	7 – 13 Oct	(Price: Ch. 6 – Managing Raster Data)	3	
	8 Oct	Lab 7:		Lab 6
8	14 – 20 Oct	UNIT 5: Creating, Editing, and Exploring Attribute Data (Price: Ch. 7 – Attribute Data)	6	
	15 Oct	Lab 8:		Lab 7
9	21 – 27 Oct	EXAM 1 (October 24) WSU Testing Centers (written part)	1, 2, 3, 4, 6	
	22 Oct	No Lab		---
10	28 Oct – 3 Nov	UNIT 6: Creating, Organizing, and Editing Geospatial Data – Geodatabase (Price: Ch. 8 – Editing)	5, 6	
	29 Oct	Lab 9:		Lab 8
11	4 – 10 Nov	UNIT 7: Metadata in GIS (Source: TBD) **Final project - assigned	7	
	5 Nov	Lab 10:		Lab 9
12	11 – 17 Nov	UNIT 8: Geospatial Data Exploration (Price: Ch. 9 – Queries)	8	
	12 Nov	Lab 11:		Lab 10
13	18 – 24 Nov	Spatial Joins (Price: Ch. 10 – Joins and Overlay)	8	
	19 Nov	Lab 12:		Lab 11
14	25 Nov – 1 Dec	UNIT 9: Final Project	9	
	26 Nov	Lab session: work on final project		Lab 12
15	2 – 8 Dec	UNIT 10: Sharing Data & Workflows (Price: Ch. 12 – Sharing GIS)	6, 9	
	3 Dec	Lab session: work on final project FINAL PROJECT DUE (Dec 6) 11:59 pm		Final Project
16	9 – 12 Dec	EXAM 2 (December 9 - 12) Written Part: WSU Testing Centers Lab Part: Computer with ArcGIS Pro	5, 6, 7, 8, 9	



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