

**GEOSCIENCES (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: TO BE DETERMINED
Location TO BE DETERMINED

Instructor: Michael W Hernandez, Ph.D.
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Communication: **WSUOnline – Canvas messaging system (preferred)**
mhernandez@weber.edu (alternate)

Office Hours: TO BE DETERMINED OR by appointment

REQUIRED MATERIALS

- Weber State University Custom Spiral-bound hardcopy of both texts under ISBN: 9781307254563 (\$145.00 for both texts)

Chang, Kang-tsung. (2019) *Introduction to Geographic Information Systems, 9th Edition*. New York: McGraw Hill.

Price, Maribeth, (2019) *Mastering ArcGIS, 8th Edition*. New York: McGraw Hill.

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, 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, and relates.
9. Apply multiple concepts and software operations learned in SLOs 1 – 8 to investigate a geospatial problem.

PREREQUISITE / COREQUISITE:

- GEO 1710: GEOG 1990 (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

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 (40% of grade)
11 Labs (35% of grade)
1 Final Project (25%)

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)
- Collaborative Learning
- Computer Assisted Instruction
- Lab Exercises

COURSE OUTLINE

Week	Date	UNITS	SLOs (number)	Labs Due
1		UNIT 1: Introduction to Geospatial Technology		
		<i>Lab 1:</i>		
2		UNIT 2: Understanding Spatial Data		
		<i>Lab 2:</i>		Lab 1
3		UNIT 3: Raster & Vector Data Models		
		<i>No Lab</i>		Lab 2
4		Raster & Vector Data (cont'd)		
		<i>Lab 3:</i>		---
5		UNIT 4: Displaying Geospatial Data: Map Coordinate Systems		
		<i>Lab 4:</i>		Lab 3
6		Map Coordinate Systems (cont'd)		
		EXAM 1		
		<i>Lab 5:</i>		Lab 4
7		UNIT 5: Organizing Geospatial Data: Geodatabases		
		<i>Lab 6:</i>		Lab 5
8		UNIT 6: Creating, Editing, and Managing Geospatial Data		
		<i>Lab 7:</i>		Lab 6

9		Creating, Editing, & Managing Geospatial Data (cont'd)		
		<i>Lab 8:</i>		Lab 7
10		UNIT 7: Geospatial Metadata		
		<i>Lab 9:</i>		Lab 8
11		UNIT 8: Geospatial Data Exploration		
		<i>Lab 10:</i>		Lab 9
12		Geospatial Data Exploration (cont'd) EXAM 2		
		<i>Lab 11:</i>		Lab 10
13		UNIT: 9: Final Project		
		<i>Lab session: work on final project</i>		Lab 11
14		Final Project (cont'd)		
		<i>Lab session: work on final project</i>		---
15		Final Project (cont'd)		
		<i>Lab session: work on final project</i>		Final Project



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