

***COMPUTERS IN LANDSCAPE ARCHITECTURE:
INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS
LA 415/ 515***

Department of Landscape Architecture
School of Architecture and Allied Arts
University of Oregon

**Winter 2017
4 Credits**

**T/Th 2:00 p.m. – 3:50 p.m.
442 McKenzie Hall (SSIL computer lab)**

Instructor: Chris Enright, cenright@uoregon.edu
GTF: Keegan Oneal, koneal@uoregon.edu



Course Description

In this course students are introduced to the use of GIS for the representation, planning and design of landscapes. The course provides a foundation in the use of vector and raster tools in ESRI's ArcMap software and an introduction to ArcScene's 3D capabilities from the perspective of the discipline of Landscape Architecture.

Course Format

The general format of the class will be instruction and demonstration of the software and discussions about the use of the software during the first hour and, individual or small group work sessions during the second hour. Discussions during the first hour include open class discussions about assigned readings as well as topics that arise as students are learning to use the software. The in-class work sessions allow students to spend time on assignments with opportunities for individual guidance from the Instructor and GTF.

Course Objectives

Students are expected to gain the following skills during the quarter:

Facility with ArcMap's graphic tools for creating basic landscape representation maps

A basic understanding of working with vector and raster file formats in GIS

The use and application of fundamental vector and raster analysis tools in GIS

The use of other software programs, specifically Excel and Illustrator, as part of workflow using GIS

The ability to generate 3D landscape representations using GIS

An understanding of the appropriate use of GIS in landscape analysis and design

Requirements/ Grading

This class can be taken for a grade or Pass/ No Pass. The majority of the work is individual but the class includes short term group assignments. Active class participation, class assignments, quizzes, formal and informal student presentations and the final project will provide the framework for student evaluation. *All assignments must be satisfactorily completed to receive a passing grade in the class.*

Grades will be based on successful completion of the following:

- 25% Attendance, class participation and participation in reading discussions
For graduate students this includes a brief writing assignment on two additional readings
Quizzes may be included in this portion of the grade
- 50% Assignments
- 25% Final project (individual)

Location

The course meets in room 442 McKenzie Hall except for the final class on March 9th (that location TBA).

The class divides broadly into 4 parts:

- 1st part Introduction to GIS: Lectures and presentations introducing ArcGIS software and its cartographic uses
- 2nd part Introduction to Vector Query and Analysis Tools
- 3rd part Introduction to Raster Tools and Analysis and 3D Representation
- 4th part Final project: In the final project, students will use skills acquired during the quarter to complete and present a suitability analysis. Students are expected to use class time to work towards completion of this project.

Plan to spend time on the Final Project - February 23rd through March 9th

Anytime you have a question in class, stop me and ask.

The University of Oregon is working to create inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your participation, please notify me as soon as possible. You are also welcome to contact the Accessible Educational Center in 164 Oregon Hall at 346-1155 or uoaec@uoregon.edu.

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Week 1

Intro to GIS: Vector tools and cartographic uses

1/10 Tuesday: *Intro to course and GIS*: structure, facilities, intent, GIS, overview of raster and vector data structures.

Introduction to computer lab, ArcGIS software and course data.

Course Guide 1

1/12 Thursday: Working with ArcMap. Data view, layout view, output. Symbolizing features, graphic tools.
Assignment 1: Creating a Context Map (Due 1/19).
Work on Assignment 1.

Week 2

Intro to data query and classification with vector tools

Week 2 reading: Hanna, GIS for LA: Intro; McElvaney, Geodesign: Chapter 1, Game-Changing Design

1/17 Tuesday: Working with ArcMap continued – map layout elements; attributes, attribute queries.
In class exercise – working with attributes

Course Guide 2

1/19 Thursday: Working with attributes continued. Editing tables, data representation and classification.

ASSIGNMENT 1 DUE

Assignment 2: Land use/ land cover map (Due 1/26)

Work on Assignment 2.

Week 3

Working with attributes continued, Introduction to vector spatial queries and overlays

Week 3 reading: Hanna, GIS for LA: Chapters 1 and 6

1/24 Tuesday: Working with attributes continued. Working with Excel.
Work on Assignment 2.

Excel Course Guide

1/26 Thursday: Spatial queries, intro to spatial overlay, combining selection methods, creating buffers.
Introduction to process diagrams

Course Guide 3

ASSIGNMENT 2 DUE

Assignment 3: Working with spatial queries, buffers and multiple data frames (Due 2/2)

Week 4

Vector spatial queries, overlays and buffers; suitability analysis

Week 4 reading: McElvaney, Geodesign: Chapter 8

1/31 Tuesday: Spatial overlay continued, review buffer, data clipping, data export, adding data frames
Course Guide 5

2/2 Thursday: Spatial reference in GIS, file formats, review working with vector data
Course Guide 6

ASSIGNMENT 3 DUE

Assignment 4: Vector suitability analysis – small group assignment (Due 2/14)

Week 5

Suitability analysis using vector data

Review ILARIS poster

2/7 Tuesday: Creating and editing shapefiles, classifying data, joining attribute tables
Course Guide 6

Work on Assignment 4

2/9 Thursday: Wrap up working with vector data, working with data from different sources
Course Guide 6

In class exercise

Week 6

GIS data and introduction to raster analysis

Week 6 reading: African Elephant Cause Aided by the GIS Community:

<http://www.esri.com/news/arcnews/fall02articles/african-elephant.html>

Boston, Massachusetts, Develops an Industrial Archaeology Mapping Project with GIS

<http://www.esri.com/news/arcnews/summer03articles/boston-mass.html>

2/14 Tuesday: Review vector/ raster data structure. Introduction to Raster in ArcMap
Course Guide 4

ASSIGNMENT 4 DUE, IN CLASS PRESENTATION

2/16 Thursday: Raster tools and analysis.

Course Guide 4

Assignment 5: Using raster tools (Due 2/23)

Week 7

Intro to Suitability Mapping using ArcMap raster tools

2/21 Tuesday: Raster tools continued

2/23 Thursday: Raster tools continued

ASSIGNMENT 5 DUE

Assignment 6, Final Project - students choose, apply and document in poster form a technique of suitability analysis with visualization using ArcMap raster /vector tools and data structures. Due to be presented in class on 3/9. Discuss use of process flowcharts as organizational tool.

Week 8

ArcScene, Final Project

2/28 Tuesday:

Introduction to 3D Visualization - ArcScene

Each student's Final Project process diagram reviewed in class by Chris or Keegan

Course Guide 7

3/2 Thursday:

3D Tools/ Visualization continued. Process diagram review continued as needed

Week 9

Final Presentations

3/7 Tuesday: Time to work on Final Project

3/9 Thursday: **FINAL POSTER PRESENTATIONS** (Location TBA)