

LA 415/515 Computers in Landscape Architecture: Introduction to Geographic Information Systems

Winter 2014

Chris Enright

GTF Pieter Van Remoortere

T/Th 10:00 a.m. – 11:50 a.m.

222 Lawrence Hall and McKenzie 445 computer lab

Department of Landscape Architecture

School of Architecture and Allied Arts

University of Oregon

COURSE SYLLABUS

Intent: to explore the uses of GIS in the planning, envisioning, and designing of landscapes. Working with Windows computers and associated hardware and software, students will employ a geographic data base to develop a cartographic suitability model for locating and visualizing a focus area using both raster and vector data.

Goals: for each student to understand the situations appropriate to the use of GIS in landscape analysis and design, and the advantages to be gained from their use.

Objectives: at the conclusion of the course students will be introduced to the following:
the use of personal computers for a variety of graphic, geographic, analytic and land design problems;
the use of ArcGIS - a Windows vector and raster geographic information system - in the organization and execution of a computer-based landscape suitability study.

Required Purchases: GIS for Landscape Architects by Karen Hanna.

Optional Purchases: cost of printing the pdf course-specific Instructional Guides, thumb drive for backup storage of your digital work.

Prerequisites: LA 4/540 Introduction to Landscape Planning

This course assumes all students are already personal computer users and are familiar with the graphic interface and operating system characteristics of Windows-based computers. If you wish to take the class and are not currently comfortable with your computer literacy, see the instructor on the first day of class.

REQUIREMENTS/GRADING:

This is a grade or Pass/No Pass optional course. The majority of the work is individual but the class includes short term team assignments. The course is designed so that the class may, at times, function as a whole, with variously constituted teams coming together and disbanding as the demands of course projects require. Active class participation and a series of formal and informal student presentations and projects will provide the framework for student evaluation.

Grades will be based on successful completion of the following:

- 25% Attendance, class participation and participation in weekly reading discussions
- 50% Problem statements and exercises (5 total)
- 25% Final project (individual)

FACILITIES

The course will meet in room 222 Lawrence Hall and use the computer lab in room McKenzie Hall 445.

OFFICE HOURS:

- Chris – TBA and by appointment (cenright@uoregon.edu)
- Pieter – TBA and by appointment (pieterv@uoregon.edu)

The class divides broadly into 4 parts:

- 1st part Intro to GIS: 4 sessions -- Lectures and presentations introducing Arc software and its cartographic uses; students are expected to do readings prior to class, attend, participate, and correctly complete 1 assignment
- 2nd part Intro to Vector Query and Analysis Tools: 6 sessions -- students are expected to do readings prior to class, attend, participate, and correctly complete 3 assignments
- 3rd part Intro to Raster Tools and Analysis: 4 sessions -- students are expected to attend, participate, and correctly complete 1 assignment.
- 4th part Final projects: 4 sessions including presentation. 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.

Busy time for students: February 20 through March 6

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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Pieter Van Remoortere GTF

Week 1 Intro to GIS

1/7 Tuesday: *Intro to course*: structure, facilities, players, intent, GIS, raster and vector data structures overview. *Intro to GIS*: An Overview of the State of the Tool; overview raster primitives and their strengths and weaknesses, inescapable issues of how GIS data classifications do/don't represent the world.

Introduction to lab. (start in Lawrence 222, then to McK 445)

1/9 Thursday: Introduction to ArcGIS software and course data. (McK 445)

Course Guide 1

Week 2 Intro to vector tools, cartographic uses

week 2 readings: Hanna: GIS for LA's pp. 1-3, 37-45. (McK 445)

1/14 Tuesday: Working with ArcMap. Data view, layout view, output. Symbolizing features, graphic tools. Working with attributes.

Assign Problem 1: Creating a Context Map (due 1/21). Work on problem 1.

(McK 445)

Course Guide 2

1/16 Thursday: Working with ArcMap con't. – map layout elements; attributes, attribute queries. In class exercise – working with attributes (McK 445)

Week 3 Intro to data query and classification with vector tools

week 3 readings: Hanna: GIS for LA's pp. 5-11, pp. 47-54

1/21 Tuesday: Working with attributes con't. Editing tables, data representation and classification. (McK 445)

Problem 1 due. Assign problem 2: Land use/ land cover map (due 1/28)

Work on problem 2.

1/23 Thursday: Working with attributes con't. Working with Excel. (McK 445)

Work on problem 2.

Excel Course Guide

Week 4 Vector spatial queries, overlays and buffers

1/28 Tuesday: Spatial queries, intro to spatial overlay, combining selection methods, creating buffers. Introduction to process diagrams. (McK 445)

Problem 2 due. Assign problem 3: Working with spatial queries and buffers (due 2/4)

Course Guide 3

1/30 Thursday: Spatial overlay continued, review buffer, data clipping, data export, adding data frames (McK 445)

Course Guide 5

Week 5 Suitability analysis using vector data

week 5 readings: Hanna: GIS for LA's pp. 17-24, pp.55-66. ILARIS poster (will be sent via email)

2/4 Tuesday: Spatial reference in GIS, review working with vector data (McK 445)
Problem 3 due. Assign problem 4: Finding suitable places for riparian restoration (due 2/13)

2/6 Thursday: Review (McK 445)

GIS data – sources, file formats and other things that could come in handy.

Work on problem 4

Course Guide 6**Week 6 GIS data and introduction to raster analysis**

week 6 readings: 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>

2/11 Tuesday: GIS data – sources, file formats and other things that could come in handy (continued). (McK 445)

In class exercise

Course Guide 6

2/13 Thursday: Review vector/ raster data structure. Introduction to Raster in ArcMap (McK 445)

Problem 4 due, in class presentation.

Course Guide 4**Week 7 Intro to Suitability Mapping using ArcMap raster tools**

2/18 Tuesday: Raster tools and analysis. (McK 445)

Assign problem 5: Using raster tools (due 2/20 at the end of class)

2/20 Thursday: Raster tools continued (McK 445)

Problem 5 due at the end of class

Assign Problem 6 - student's 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 3/6. Discuss use of process flowcharts as organizational tool.

Week 8 Final Project

2/25 Tuesday: (McK 445)

Introduction to Visualization - ArcScene

Each student's Problem 6 process diagram reviewed in class by Chris or Pieter

Course Guide 7

2/27 Thursday: Work session for Prob. 6 (McK 445)

Visualization continued – Google Earth. Process diagram review continued as needed

Week 9 Final Presentations

3/4 Tuesday: Time to work on individual study areas and Final Presentations. (McK 445)

3/6 Thursday: Final Presentations (**Location to be determined**)