

# **GEOG 472/572 – WINTER 2012**

## **ADVANCED GEOGRAPHIC INFORMATION SYSTEMS**

### **SYLLABUS**

Department of Geography  
College of Arts and Sciences  
University of Oregon

This course explores topics on the frontier of Geographic Information Science and Systems. V1 Magazine recently listed spatial data managers, 3D spatial analysts and geo-social coordinators to be the “hottest jobs in the geospatial sector today”. These jobs coincide with much of the state-of-the-art research that is currently undertaken at leading research institutions around the country. In this course you will learn about managing disparate data sources for solving socioeconomic problems, modeling urban and natural environments in 3D, creating maps and mapping applications to be dispersed on a GIS Cloud, and developing programming scripts to iterate repetitive GIS tasks. You will also be exposed to some of the philosophical foundations to the field of Geographic Information Science. Weekly lectures will provide you with the theory and information for completing three major assignments throughout the term. In a selected lecture you will provide a presentation on cutting-edge GIS applications relevant to the topic of the day. This course will also provide you with the unique experience of belonging to a select few who will be testing a Beta version of ArcGIS Online – Esri’s Cloud GIS platform.

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#### COURSE DETAILS

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**INSTRUCTOR:** DR. CHRISTOPHER BONE  
EMAIL: [cbone@uoregon.edu](mailto:cbone@uoregon.edu)  
OFFICE: CONDON HALL, ROOM 107D  
OFFICE HOUR: THURSDAYS @ 2:00PM

**TEACHING ASSISTANT:** BEN METCALFE  
EMAIL: [bmetcal1@uoregon.edu](mailto:bmetcal1@uoregon.edu)

**READINGS:** A collection of textbook chapters, scientific journal articles, magazine articles and websites. Required readings will be posted by Thursday afternoons in the week prior to lectures.

**COURSE TEXT:** AN INTRODUCTION TO GEOGRAPHICAL INFORMATION SYSTEMS: THIRD EDITION (2006) I. HYEWOOD, S. CORNELIUS AND S. CARVER.

#### **COURSE GUIDELINES**

- Course website is located on Blackboard at: [blackboard.uoregon.edu](http://blackboard.uoregon.edu)
- Weekly labs are held in the Social Science Instructional Laboratory, MCKENZIE 442.
- There will be a 5% per day penalty for late assignments.
- Abide by the university plagiarism guidelines; please visit:  
<http://libweb.uoregon.edu/guides/plagiarism/students/>
- There will not be any opportunity to make-up assignments or exams that were missed or in which students received an undesirable grade.

## GRADING

### GEOG 472

3 LAB ASSIGNMENTS: 50%  
PRESENTATION: 5%  
MIDTERM EXAM: 20%  
FINAL EXAM: 25%

### GEOG 572

3 LAB ASSIGNMENTS: 50%  
PRESENTATION: 5%  
MIDTERM EXAM: 15%  
FINAL EXAM: 20%  
CRITIQUES 10%

## ASSIGNMENTS

Assignments constitute the majority of your final mark in GEOG 472/572 and will be used to evaluate your ability to integrate the knowledge acquired in lecture to various GIS applications. Assignments will consist of configuring census data to be used in ArcGIS, analyzing socioeconomic spatial patterns using census data in ArcGIS, creating an analytical model for allocating resources to target populations, displaying 3D data and developing 3D navigation and animation, and sharing maps and mapping applications on an online mapping server. It is imperative to attend all lectures and labs to ensure that you receive adequate instruction on completing assignments.

## PRESENTATIONS

You and a co-presenter will provide a five-minute presentation at the end of a selected lecture. You are responsible for presenting state-of-the-art GIS applications that are relevant to the lecture of the day. You can utilize a collection of websites, newspaper, journal and magazine articles to accumulate sufficient material in order to present a topic that is interesting and informative. You can use MS Power Point or any other presentation device you desire. You will be graded based on the richness of your content and the quality of your presentation. A sign-up sheet will be provided in the first week of class in which time slots will be available on a first-come first-serve basis. You MUST discuss with me your ideas before your presentation. All presentation slides/materials are due 12:00pm the day prior to the presentation. GEOG 572 students will be paired together and are expected to focus their presentations on material from the academic literature.

## CRITIQUES (GEOG 572)

We will be reading, critiquing and discussing two scientific papers during the term. You are responsible for reading each paper, writing a two-page critique and presenting your thoughts in a scheduled reading group.

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## COURSE SCHEDULE

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### WEEK 1

#### Lecture 1

Frontiers of Geographic Information Science and Systems

January 9

#### Lecture 2

GIS and the Census

January 11

**Lab 1:** Working with Census Data in ArcGIS  
Assignment 1a Assigned

**WEEK 2****ANALYTICAL MODELING****Martin Luther King Day: No Lecture****January 16****Lecture 3**

Socioeconomic Analysis with GIS and Census Data

**January 18****Lab 2:** No Lab on Monday; Open Help Session on Wednesday**WEEK 3****ANALYTICAL MODELING****Lecture 4**

Geocoding

**January 23****Lecture 5**

Network Analysis

**January 25****Lab 3:** Geocoding and Network Analysis Tools  
Assignment 1b Assigned**WEEK 4****ANALYTICAL MODELING****Lecture 6**

GIS and Environmental Modeling

**January 30****Lecture 7**

Modeling Geographic Processes: Guest Lecture with Dr. Max Nielsen-Pincus, University of Oregon

**February 1****Lab 4:** Presenting Modeling Outputs  
\* GEOG 572 Reading Group**WEEK 5****3D GIS****Lecture 8**

Introduction to 3D GIS

**February 6****Lecture 9**

Advanced Terrain Modeling

**February 8****Lab 5:** Using ArcScene  
Assignment 2 Assigned  
ASSIGNMENT 1 DUE**WEEK 6****3D GIS****Lecture 10**

3D Navigation and Animation

**February 13****Lecture 11**

MIDTERM EXAM

**February 15****Lab 6:** Using ArcGlobe

**WEEK 7****WEB-BASED GIS****Lecture 12**

Web-based GIS I: Mapping on the Cloud

**February 20****Lecture 13**

Creating Web-based Mapping Applications I

**February 23****Lab 7:** ArcGIS Online

Assignment 3 Assigned

ASSIGNMENT 2 DUE

**WEEK 8****WEB-BASED GIS****Lecture 14**

Creating Web-based Mapping Applications II

**February 27****Lecture 15**

GIS and Social Media

**February 29****Lab 8:** ArcGIS Online

\* GEOG 572 Reading Group

**WEEK 9****PROGRAMMING****Lecture 16**

Geoprocessing with Python

**March 5****Lecture 17**

More Geoprocessing with Python

**March 7****Lab 9:** Creating Basic Python Scripts in ArcGIS**WEEK 10****CONCEPTUAL FOUNDATIONS OF GISCIENCE****Lecture 18**

Philosophical Perspectives

**March 12****Lecture 19**

Metaphysics, Ontologies and Epistemologies in GIScience

**March 14****Lab 10:** ASSIGNMENT 3 DUE

\* Date and time to be determined.