GEOG 488/588 USP 591
Geographic Information Systems I: Introduction

<table>
<thead>
<tr>
<th>Undergraduates</th>
<th>Graduate Students</th>
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<tr>
<td><strong>Section</strong></td>
<td><strong>CRN</strong></td>
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<tr>
<td>GEOG 488-001</td>
<td>61811</td>
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<tr>
<td>USP 591-001</td>
<td>64677</td>
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<tr>
<td>Lab</td>
<td>GEOG 488L-002</td>
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<td>GEOG 488L-003</td>
<td>61813</td>
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<td>GEOG 488L-004</td>
<td>61814</td>
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Prerequisite: GEOG 380, or instructor approval

Instructor: Chris Grant
E-mail: cag2@pdx.edu
Office: 424-C Cramer Hall
Office Hours: by appointment

Teaching Assistants: Emma Brenneman <brennem2@pdx.edu>, Elinore Webb <elinore@pdx.edu>

Course Materials: We will use D2L for this course (d2l.pdx.edu).

Course Objectives
GEOG 488/588 is an introductory course covering the theory and application of geographic information systems (GIS). The course includes an overview of the general principles of GIS and practical experience in its use. The practical component involves the use of the desktop GIS software package ArcGIS Desktop 10. Both the theoretical and practical components of the course are important. Without a theoretical understanding of GIS methods, you will make poor geographic modeling decisions and when necessary you will not be able to migrate to a new or different GIS software package. Without a practical understanding of GIS software, your theoretical knowledge cannot be put to use.

Text and Readings
The textbook for the course is:

The book that will be used for the computer lab exercises is:
Tests
There will be two midterms. The first will be a closed-book, in-class exam. The second will be an open-book, take-home exam. There will be no final exam. We will use that assigned time period for project presentations.

In-Class Exercises
There will be occasional in-class exercises to reinforce key concepts. If you are present in class to do the exercise, you get credit. The in-class exercises cannot be made up.

Computer Lab Exercises
There will be eight weekly lab assignments that use ArcGIS software. Each assignment will be a mix of tutorials from the *Getting to Know ArcGIS* book plus some additional exercises where you apply what you learned in the tutorial. These exercises provide a way to acquire skills using ArcGIS and allow you to apply the course concepts to real data.

The lab exercises will take longer to complete than the 2-hour lab session. You can get access to the computer lab in Cramer Hall 469, and may use the room any time that it is not being used for another class (check the room schedule posted on door of CH469). Go to this website and complete the form to get badge access to the lab:

https://sites.google.com/a/pdx.edu/geog-ch469/access-form

You can also access ArcGIS in most public computer labs on campus, or you can perform these exercises on a home computer using a student license for the software. How to obtain and use a student license will be described in the first class meeting (or contact your instructor).

Project
Each student must complete a final project in which you will investigate a GIS application in depth. The project is intended to provide a deeper understanding of GIS through an investigation of a particular research problem. You will need to acquire the spatial data, and the project must involve some type of spatial analysis using the GIS software package you have been using in class. That means you must do more than just make maps. It is suggested that you use secondary GIS data sources available online to do your project. While you are welcome to digitize or do a GPS survey to create your own spatial dataset, doing so is very time-consuming and is not the purpose of this project. Performing a spatial analysis is the purpose of this project. The grade for your project is based on the cohesiveness and logic of your research question, and the appropriateness of the methods and techniques. The complexity and comprehensiveness of your project will not be criteria for judging the quality of your project.

Graduate students will work on self-defined projects. There are three stages to the project:

1. Submit a one or two page project proposal by the end of week 5. It should include a research question, a detailed description of the spatial and attribute databases you will use, and a conceptual description of the methods you will use. **You must discuss the proposal with the instructor before turning it in.**
2. Schedule your presentation for either the final day of class or during finals week.
3. Oral presentations. Every presentation must include the following sections: an Introduction, Datasets Used, Analysis Methods, Results, and Conclusions. Turn in a printed Powerpoint presentation.

Undergraduate students will be given several pre-defined projects to choose from—the project will be like a lab exercise, but with very few instructions. A project report must be submitted by the time of the final exam period. As an alternative, undergraduate students are welcome to work on a project of their own choosing, either on their own or in a group. If this option is chosen, then the student or group must submit a project proposal.

Grading

488:
- Lab Assignments 50%
- In-class Exercises 5%
- Tests 30%
- Project 15%

588/591:
- Lab Assignments 40%
- In-class Exercises 5%
- Tests 30%
- Project 25%

Grading break points will be near 90% (A), 80% (B), and 70% (C). However, exact break points will depend on overall class results. For the pass/no-pass grading option (P/NP), a “pass” grade requires an overall grade of C or better.

Academic Integrity

You are responsible for the content and integrity of the academic work you submit. The guiding principle of academic integrity shall be that your submitted work, examinations, and projects must be your own work. Note that cutting and pasting sources from the internet is considered plagiarism. If you need help determining what is or is not plagiarism, please talk to the instructor.

Access and Inclusion for Students with Disabilities

PSU values diversity and inclusion; we are committed to fostering mutual respect and full participation for all students. My goal is to create a learning environment that is equitable, useable, inclusive, and welcoming. If any aspects of instruction or course design result in barriers to your inclusion or learning, please notify me. The Disability Resource Center (DRC) provides reasonable accommodations for students who encounter barriers in the learning environment.

If you have, or think you may have, a disability that may affect your work in this class and feel you need accommodations, contact the Disability Resource Center to schedule an appointment and initiate a conversation about reasonable accommodations. The DRC is located in 116 Smith Memorial Student Union, 503-725-4150, drc@pdx.edu, http://www.pdx.edu/drc.

- If you already have accommodations, please contact me to make sure that I have received a faculty notification letter and to discuss your accommodations.
• Students who need accommodations for tests and quizzes are expected to schedule their tests to overlap with the time the class is taking the test.
• Please be aware that the accessible tables or chairs in the room should remain available for students who find that standard classroom seating is not useable.

**Title IX / Non-discrimination Statement**
As an instructor, one of my responsibilities is to help create a safe learning environment for my students and for the campus as a whole. *We expect a culture of professionalism and mutual respect in our department and class.* You may report any incident of discrimination or discriminatory harassment, including sexual harassment, to either the Office of Equity and Compliance (http://www.pdx.edu/diversity/office-of-equity-compliance), or to the Office of the Dean of Student Life (http://www.pdx.edu/dos/student-conduct-at-psu).

Please be aware that, as a faculty member, I have a responsibility to report any instances of sexual harassment, sexual violence, and/or other forms of prohibited discrimination. If you would rather share information about sexual harassment or sexual violence to a confidential employee who does not have this reporting responsibility, you can find a list of such individuals at (http://www.pdx.edu/sexual-assault/get-help). For more information about Title IX, please complete the required student module, Creating a Safe Campus, in your D2L (http://www.pdx.edu/sexual-assault/safe-campus-module).

**Statement Regarding Mobile Communication Devices**
The use of personal electronic devices such as laptop computers, tablets, or cellphones during class is permitted, provided they are used in a way that is consistent with the academic mission of the class, does not disrupt the class, and does not cause a distraction for other students in the class. Please set your cellphone ringers to silent or vibrate-only mode at the start of class. Please do not talk on your phone during class, including the lab portion of class. I recognize that urgent situations arise that may require you to accept a call during class time. If you must take or make a call during class, please quietly step into the hall, and conduct your call there.

**Flexibility Statement**
The instructor reserves the right to modify course content and/or substitute assignments and learning activities in response to institutional, weather, or class situations.

**Add / Drop / Withdraw Dates**
*Last Day to Drop with full refund:* 8 Apr
*Last Day to Add:* 13 Apr
*Last Day to Drop:* 15 Apr
*Last Day to Withdraw:* 20 May
(http://www.pdx.edu/registration/calendar)
## Course Schedule

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<th>Week</th>
<th>Topic - Tuesday</th>
<th>Topic – Thursday</th>
<th>Lab</th>
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<tbody>
<tr>
<td>1  Apr 3/5</td>
<td>course overview intro to GIS (Bolstad CH 1)</td>
<td>GIS applications data models (Bolstad CH 2)</td>
<td>Lab 1: Introduction to ArcGIS</td>
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<tr>
<td>2  Apr 10/12</td>
<td>data models (cont.) cartography</td>
<td>term project info data sources (CH 7)</td>
<td>Lab 2: Map Symbology and Classification</td>
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<td>3  Apr 17/19</td>
<td>locating systems (CH 3)</td>
<td>geographic databases and queries (CH 8)</td>
<td>Lab 3: Projections and Data Acquisition</td>
</tr>
<tr>
<td>4  Apr 24/26</td>
<td>data collection and creation (CH 4)</td>
<td>Midterm 1</td>
<td>Lab 4: Querying Data, Joins/Relates, Selecting by Location</td>
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<tr>
<td>5  May 1/3</td>
<td>nature of geographic data</td>
<td>data uncertainty (CH 14)</td>
<td>Lab 5: Building Geodatabases, Creating Features</td>
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<td>6  May 8/10</td>
<td>spatial analysis vector analysis (CH 9)</td>
<td>vector continued (CH 9)</td>
<td>Lab 6: Geocoding Addresses and Mapping GPS Data</td>
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<tr>
<td>7  May 15/17</td>
<td>raster analysis (CH 10 and 11)</td>
<td>raster continued (CH 10 and 11)</td>
<td>Lab 7: Introduction to Spatial Analysis</td>
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<tr>
<td>8  May 22/24</td>
<td>spatial statistics (CH 12)</td>
<td>spatial modeling (CH 13)</td>
<td>Lab 8: Raster Spatial Analysis</td>
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<td>9  May 29/31</td>
<td>work on midterm (no formal lecture)</td>
<td>TBD</td>
<td>work on project</td>
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<tr>
<td>10 Jun 5/7</td>
<td>GIS software (CH 15)</td>
<td>Grad Student Presentations</td>
<td>work on project</td>
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<td>11 Jun 12</td>
<td>Grad Student Presentations</td>
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Notes:
Memorial Day, **Monday 28 May**, is a holiday (university closed).
Our last class meeting, **12 Jun**, is on **Tuesday**, but at a **different time** than our regular lectures (last class will meet **15:30-17:20** in CH 413).