

## Geog 4/581 - GIScience 1: Mapping and the Geographic Information Sciences

**Lecture:** 11:00-11:50mw in 101 LIB

**Labs:** M 12-13:50 or W 12-13:50 in SSIL (442 MCK) or M 12-13:50 in SSIL (445 MCK)

**Course Website:** [blackboard.uoregon.edu](http://blackboard.uoregon.edu)

**Instructor:** Dr. Nick Kohler ([nicholas@uoregon.edu](mailto:nicholas@uoregon.edu))

**Office:** 107e Condon Hall

**Office Hours:** Tu 1-2pm, or by appointment

**GTFs:** Megen Brittel ([megen@uoregon.edu](mailto:megen@uoregon.edu))

**Office Hours in SSIL:** Th 2-3

Matt Goslin ([goslin@uoregon.edu](mailto:goslin@uoregon.edu))

**Office Hours in SSIL:** Tu 10-11

An introduction to mapping, geospatial data, cartography and spatial analysis, this class addresses questions in three major areas:

1. How can people sense and represent the 'real' world?
2. How can we record, recall, and analyse this data?
3. How can we communicate and discuss the information we derive?

The class explores these questions through lectures, discussions, and the applied use of software designed to facilitate the recording, symbolization, analysis, and communication of data about the world. In short, how to record data about the the real world and turn in into information useful for acting in the real world. This is what maps do, and much of the work in the class will involve the use of "Geographic Information Systems (GIS)" or other mapping software.

Lectures and other class activities focus on the basic theory and practices of geospatial data management and analysis. Labs explore the techniques of geospatial analysis and modern digital cartography using desktop Geographic Information Systems and online mapping applications. The implications of the development of modern geospatial data collection and analysis capabilities are explored in class discussions and other activities. These examine how geospatial techniques and technologies are changing the way science, business, and society operates.

By the end of the class, students should have a sound understanding of how spatial data is represented, how this data is stored and analysed, how geospatial data and analysis results are communicated, and why and when these techniques are appropriate. Applied skills learned include the ability to manage geospatial data and to create maps and conduct basic spatial analysis using GIS software, how to follow instructions, and to find help and move forward when the instructions or equipment fails.

**Readings:** Readings should be done *before* the week they are listed with

**Required Text - Map Use: Reading, Analysis, Interpretation (7th Edition)** Kimerling et al.

*Supplemental readings will be linked to in lecture notes, the syllabi, in labs, or on Blackboard*

**Course Grading:**

**50% - Quizzes and Group Exercises:** 3 scheduled longer quizzes and additional take-home or in-class quizzes and exercises.

**50% - Lab exercises:** Due at the start of lab on their assigned due date - lab assignments will often require extra work outside of class time to complete!

*\* late work will get reduced credit of 10% per day late. No late tests or final projects accepted*

*Graduate students have additional requirements of an original final project, annotated bibliography (or substitute map assignment) and presentation of their final project work*

**Course Schedule, Fall 2014 (Draft Oct 8)**

Week and Topic	Lecture	Readings	Lab
<p><b>Week 1</b>  <b>Conceptual Foundations:</b></p> <p><b>Geospatial Sciences and a Short History of Cartography</b></p>	<p><b>M (9/29):</b> Geographic Information Sciences; Types of Maps;</p> <p><b>W (10/1):</b>History of GIScience and Cartography, Map Properties; Data Models and Objects</p>	<p><b>Online:</b> GIS Foundations[<a href="#">Mapping and visualization in ArcGIS for Desktop</a> ; <a href="#">What is ArcMap?</a> ; <a href="#">Introduction to GIS</a>]</p> <p><b>Online:</b> <a href="#">How GIS represents and models geographic information</a> ; <a href="#">Working with Map Scales</a> ; <a href="#">Map Scales</a> (USGS)</p> <p><b>Introduction; Ch. 1 - The earth and earth coordinates; Ch. 2 - Map scale</b></p>	<p><b>Lab 1 -</b> Introduction to SSIL. Mental maps, drawn maps, and online maps <b>25 points - due by the night before lab, week 2</b></p>
<p><b>Week 2</b>  <b>Geospatial Data: Coordinate Systems and Map Projections;</b></p>	<p><b>M (10/6):</b> Earth Geometry and Spherical Coordinate Systems; Map Projections; Cartesian Coordinate Systems</p> <p><b>W (10/8):</b>Land Partitioning Systems - Cadastral Mapping</p>	<p><b>Ch. 3- Map Projections; Ch. 4 - Grid Coordinate Systems</b></p> <p><b>Online:</b> <a href="#">What are map projections</a></p> <p><b>Ch. 5 - Land partitioning;</b></p>	<p><b>Lab 2 - Map Projections and GIS data introduction, 25 points - due by the morning before lab, week 3</b></p>
<p><b>Week 3</b>  <b>Cadastral Mapping:</b></p> <p><b>Geospatial Data: Scale and Coordinate Systems;</b></p>	<p><b>M (10/13):</b> Map Display and Spatial Analysis Introduction.</p> <p><b>W (10/15):</b> <i>Test 1 - Coordinate Systems, Map Projections, Cadastral Mapping</i></p>	<p>Readings: <i>Study for Quiz 1</i></p>	<p><b>Lab 3 - Map Design Introduction, 25 points- due by the night before lab, week 4</b></p>

<p><b>Week 4</b>  <b>Cartography and Visualization:</b>  <b>Thematic Mapping - Qualitative and Quantitative Mapping</b></p>	<p><b>M (10/20):</b> Thematic Maps; Levels of Measurement</p> <p><b>W (10/22):</b> Data Classification/Class Interval Selection</p>	<p><b>Ch. 7 - Qualitative Thematic Maps</b></p> <p><b>Ch. 8 - Quantitative Thematic Maps</b></p>	<p><b>Lab 4 -Thematic Maps, 25 points - due by the night before lab, week 5</b></p>
<p><b>Week 5</b>  <b>Data Modeling:</b>    <b>Surface Mapping and Analysis</b></p>	<p><b>M (10/27):</b> Surface Mapping and Analysis</p> <p><b>W (10/29):</b> Data presentation</p>	<p><b>Ch. 16 -Surface Analysis;</b></p> <p><b>Ch. 6 - Relief Portrayal</b></p>	<p><b>Lab 5 - Presenting GIS Data, 25 points - due by the night before lab, week 6</b></p>
<p><b>Week 6</b>  <b>Data Modeling:</b>    <b>Attribute Tables and Database Queries</b></p>	<p><b>M (11/3):</b>Attribute Tables - Statistical Operations</p> <p><b>W (11/5):</b> Spatial Selection; Saving Selections</p>	<p><i>online readings to be announced</i></p>	<p><b>Lab 6 - Tables and Queries, 25 points - due by the night before lab, week 7</b></p>
<p><b>Week 7</b>  <b>Analytical Methods:</b>    <b>Overlay Operations</b></p>	<p><b>M (11/10):</b> Overlay Analysis;</p> <p><b>W (11/12): Test 2 - Spatial Selection and Overlay Analysis</b></p>	<p><b>Online - Overlay Analysis</b></p>	<p><b>Lab 7 Introduction - Location Analysis, 40 points - due by 5pm Friday, Nov. 21 (the end of week 8)</b></p>
<p><b>Week 8</b>  <b>GIS and Society:</b>  <b>Geographic Information Sciences Overview</b></p>	<p><b>M (11/17):</b> Map Design, Data Visualization; Image Mapping</p> <p><b>W (11/19):</b> GIS Data Sources Overview -</p>	<p><b>Ch. 21 - Interpreting the Human Landscape</b></p> <p><b>Ch.9 - Image Maps Appendix A - Digital Geographic Data</b></p>	<p><b>Lab 8 - Final Project, 100 points - due by Noon on Friday, Dec. 12.</b></p>
<p><b>Week 9</b> <b>Data Modeling:</b>    <b>Image Maps/ Remote Sensing and GPS</b></p>	<p><b>M (11/24):</b> Remote Sensing and GPS</p> <p><b>W (11/26):</b>Geographic Information Sciences Overview</p>	<p><b>Ch. 14 - GPS and maps</b></p>	<p><b>Work on Final Project</b></p>
<p><b>Week 10</b></p>	<p><b>M (12/1):</b> Grad Presentations</p> <p><b>W (12/3):</b> Test 3 - GIS data sources / Geographic Information Science</p>		<p><b>Work on Final Project</b></p>

<b>Week 11</b>	<b>10:15 Fri., Dec. 12</b>		<b>Final Project due</b>
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