

**Geography 481/581 (currently listed as 410/510): Geog Info Science I**

Week 1:	Conceptual Foundations: Geospatial Sciences and a Short History of Cartography - <i>Ch. 1- The Earth and Earth Coordinates; Online: GIS Foundations'</i> ; <i>Ch. 2 - Map Scale</i>
Week 2:	Geospatial Data: Coordinate Systems and Map Projections - <i>Ch. 3- Map Projections; Ch. 4 - Grid Coordinate Systems Online: What are map projections</i>
Week 3:	Geospatial Data: Spatial Analysis and Coordinate Systems; Cadastral Mapping - <i>Ch. 5 - Land Partitioning</i>
Week 4:	Cartography and Visualization: Introduction to Thematic Mapping; Qualitative Mapping - <i>Ch.7 - Qualitative thematic maps</i>
Week 5:	Cartography and Visualization: Quantitative Mapping; Data Types and Data Classification - <i>Ch. 8 - Quantitative thematic maps</i>
Week 6:	Data Modeling: Surface Mapping and Image Maps - <i>Ch. 6 - Relief Portrayal</i>
Week 7:	Data Modeling: Attribute Tables and Database Queries - <i>Online Reading</i>
Week 8:	Analytical Methods: Overlay Operations - <i>Online Reading</i>
Week 9:	<i>Geospatial Data: GPS and Remote Sensing</i> - <i>Ch. 9 - Image Maps; Ch. 16 - Surface analysis</i>
Week 10:	GIS and Society: Geographic Information Sciences Overview - <i>Student-selected news articles</i>

### Narrative description of main topics covered in 10 weeks:

The course begins with an introduction to the topics covered by the “geographic information sciences” and a discussion of the historical development of cartographic techniques. This is followed in the second week by a discussion of the basic elements involved in mapping real-world phenomena, including modeling of the earth's shape, representing location, and symbolizing features. In the third, fourth, and fifth weeks the class focuses on different types of mapping, including cadastral mapping (land ownership) qualitative, and quantitative thematic mapping. The sixth week covers the representation of terrain and surfaces. The remainder of the course is dedicated to types of spatial analysis, including data selection and management, spatial overlay, the analysis of surface (slope, curvature, etc.), and an introduction to emerging techniques and social issues (such as privacy rights) in the geographic information sciences.

### Workload (Student Engagement Inventory)

Student engagement inventory for undergraduates:

<b>UG Educational activity</b>	<b>UG Hours</b>	<b>UG Comments (if any)</b>
Lecture Attendance	20	20 lectures (@ 1 hour)
Lab Attendance	20	10 labs (@ 2 hours)
Project and Lab Work	30	Final lab project and write up; Lab write ups
Assigned Readings	40	Course text and online readings
Written Assignments	10	10 hours total on 3 homework assignments
<b>TOTAL HOURS</b>	<b>120</b>	

Student engagement inventory for graduates:

<b>G Educational activity</b>	<b>G Hours</b>	<b>G Comments (if any)</b>
Lecture Attendance	20	20 lectures (@ 1 hour)
Lab Attendance	20	10 labs (@ 2 hours)
Project and Lab Work	30	Final lab project and write up; Lab write ups
Project Design and Presentation	20	Independent Final Lab Design and Presentation to Class
Annotated Bibliography	10	Annotated bibliography of course-related articles
Graduate Lab Meetings and Presentations	10	2 extra-class meetings with Graduate students for lab work presentations
Assigned Readings	40	Course text and online readings
Written Assignments	10	10 hours total on 3 homework assignments
<b>TOTAL HOURS</b>	<b>160</b>	

### Additional workload required of graduate students:

In addition to the same course load as undergraduate students, graduates will: 1) prepare an annotated bibliography of articles related to the course; 2) design and present the results of their own final project in cartography/geospatial analysis to the entire class during lecture, and; 3) meet in the course computer lab outside of scheduled hours several times during the term to present their lab work to each other.

## Readings

The readings primarily are from the course text “Map Use: Reading and Analysis” which is a broad introduction to the basic concepts behind modern mapping and the basics of spatial analysis using geographic information. This course text is supplemented by online readings specific to the GIS software used in the course labs (ArcGIS Desktop by ESRI) and by relevant articles from the popular press identified by graduate students for discussion in class.

Kimerling, B. and A. Buckley, J. Muehrcke, P. Muehrcke. 2009. Map Use - Reading and Analysis (6th Edition). Esri Press: Redlands, CA.

Online readings from the ArcGIS Online Resources

New articles related to the Geographic Information Sciences

Course text chapters are relatively short (from 20 to 40 pages), but quite technical and detailed, so will require a significant amount of student engagement. Along with the supplementary online readings, students are expected to spend about 3 to 5 hours outside of class per week with the readings.

Readings are available as the course text book as links to publicly available information. In addition, students will be directed to the university library website to download scientific journal articles.

## Assessment (example):

Assessment type	% of grade	Description (if any)
Attendance	5	Roll call or assignment turn-in/pick-up
Participation	5	Instructor’s perception of engagement in discussions
Problem Sets	30	A subset of questions on each week’s problem set will be selected for grading (full solution key will be provided)
Midterm exam	25	In-class exam, closed book
Final exam	35	In-class exam, closed book
TOTAL	100	

## Assessment inventory for undergraduate students:

UG Assessment type	% of grade	UG Description (if any)
Exams	50	4 in-class exams, closed book
Lab work	40	7 Weekly computer labs
Final Project	10	Final lab and accompanying write-up
TOTAL	100	

## Assessment inventory for graduate students:

G Assessment type	% of grade	G Description (if any)
Exams	50	4 in-class exams, closed book
Lab Work	30	7 Weekly computer labs
Final Project	15	Final lab, accompanying write-up, and presentation
Reading Assignments	5	Find and report on news articles related to GIScience
Group Discussions	5	Presentation of lab work to other graduate students and peer-review participation.
TOTAL	100	

## **Undergraduate grading rubric**

Students will be graded based on percentages of the total points, the class is not graded on a curve. The grading rubric followed is the Geography Department standard grading rubric, as follows:

- A+ Only used when a student's performance significantly exceeds all requirements and expectations for the class. Typically very few to no students receive this grade.
- A Excellent grasp of material and strong performance across the board, or exceptional performance in one aspect of the course offsetting somewhat less strong performance in another. Typically no more than a quarter of the students in a class receive this grade, fewer in lower-division classes.
- B Good grasp of material and good performance on most components of the course. Typically this is the most common grade.
- C Satisfactory grasp of material and/or performance on significant aspects of the class.
- D Subpar grasp of material and/or performance on significant aspects of the class.
- F Unacceptable grasp of material and/or performance on significant aspects of the class.

## **Graduate grading rubric**

Students will be graded based on percentages of the total points, the class is not graded on a curve. The grading rubric followed is the Geography Department standard grading rubric, as follows:

- A+ Only used when a student's performance significantly exceeds all requirements and expectations for the class. Typically very few to no students receive this grade.
- A Excellent grasp of material and strong performance across the board, or exceptional performance in one aspect of the course offsetting somewhat less strong performance in another. Typically no more than a quarter of the students in a class receive this grade, fewer in lower-division classes.
- B Good grasp of material and good performance on most components of the course. Typically this is the most common grade.
- C Satisfactory grasp of material and/or performance on significant aspects of the class.
- D Subpar grasp of material and/or performance on significant aspects of the class.
- F Unacceptable grasp of material and/or performance on significant aspects of the class.