

MSCI 331/331L
Introduction to Geographic Information Systems

Monday, 4:30 – 5:45, Wednesday 1:30-5:45
Atlantic Center GIS Laboratory

Instructor: Eric Wright
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<http://kingfish.coastal.edu/marine/331/>

"Wherever you go, there you are"
-Buckaroo Bonzai

"But who, when lost, has not been heard to say:
'My map shows clearly that a road is here, the land is wrong, why ask the trooper?'"
-Keith Clarke

Course Objective:

To introduce the student to the use of a geographic information system (GIS) in the scientific fields. By the end of the course, the student will have learned about data sources, input, storage, data manipulation, spatial analysis, and scientific presentation. The student should be able to discuss GIS concepts, and understand the basics of ESRI's ArcGIS software package.

Philosophy of Learning:

The study of a GIS is a computer intensive discipline that is only conquered by active problem solving. You will learn and progress by doing and by exploring in this course.

Grading:

Grading will be based on a project, two tests, homework assignments, and assessment of laboratory skills. An average grade for all work will be assigned to both course and laboratory grades. The final breakdown is as follows:

Project (includes paper, poster/display, and presentation*)	45 %
Tests	35 %
Assignments	15 %
Skills	5 %

* Presentation of project represents your final exam.

Attendance:

Attendance is highly recommended and strongly encouraged. Exam content may be drawn from material only discussed in class and not covered in the textbook. Additionally, lab exercises build upon each other. Make-up for lab exercises will only be given for medical reasons, death in the immediate family, or for an appropriate reason, which has been cleared by the instructor prior to the lab. As learning through doing is important in this course, the separation between class and laboratory will be somewhat gray.

Hint:

Computers breakdown, terminal stations fill up, networks run amuck, programs fail, and files disappear... Don't wait until the last minute to start or complete your assignments!

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TENTATIVE SCHEDULE

Date	Topics	Readings	Optional Readings*
Aug			
W	20	What is a GIS?; History	Chapter 1 (C 1; K 1; L 1, 2))
M	25	Data Input: Traditional	Chapter 5 (C 4; K 4; L 10)
W	27	Data Input II: GPS	Chapter 2 (p. 3-43) (C 4; K 4; L 10)
Sept			
M	1	Labor Day	
W	3	Editing & Errors	Chapter 6 (C 4; K 5; L 6)
M	8	Spatial Data & Coordinates	Chapter 3 (C 2; K 2; L 4)
W	10	Scales & Projections	Chapter 3 (C 2; K 2; L 4)
M	15	Data Input III: Satellites	
W	17	HGUG Meeting	
M	22	Storage and Topology	Chapter 4 (p. 102-122) (C3; K 3; L 3, 9)
W	24	Data Model & Meta Data	Reserve (Longley 9) (K 4)
M	29	Test I	
Oct			
W	1	Databases; Queries/Searches	Chapter 4 (p. 84-98); Chapter 7 (181-196) (C 5; K 6, 9; L 11)
M	6	Complex Types	Chapter 7 (196-)
W	8	Measurements	Chapter 8 (K 10; L 5, 13)
M	13	Buffers	Chapter 9 (p. 248-255) (K 10; L 13)
W	15	Arrangement	Chapter 11 (p. 297-307)
M	20	Boolean Logic	Chapter 12
W	22	Overlays	Chapter 12 (K 10)
M	27	Classification	Chapter 9 (p. 234-248) (C 6, L 12)
W	29	Raster/Surface	Chapter 10 (K 7, 12, 13; L 14)
Nov			
M	3	Project	
W	5	Project	
M	10	Modeling	Chapter 13 (C 6, K 14)
W	12	Cartography	Chapter 14 (C 7; K 8, L 12)
M	17	GIS Design/Network	Chapter 15 (C 8, 10; L 16, 18)
W	19	Test II	
M	24	Thanksgiving	
W	26	Thanksgiving	
Dec			
M	1	Project	
W	3	Project	
		Final	

Primary Text: Demers, M., Fundamentals Of Geographic Information Systems

***Other:** (C) Clarke, K., Getting Started With Geographic Information Systems (a good general introduction)

(K) Kang-tsung Chang, Geographic Information Systems (a good general introduction with ArcGIS)

(L) Longley, P A, et al, Geographic Information Systems and Science (good introduction; new data model)

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Date	Topics	Readings
August		
W 20	What is a GIS	
W 27	Data Input: Getting Data into the Computer	Handout;
September		
W 3	Introduction to ARC/INFO/ArcEdit; & Editing/Correcting Data	Handout
W 10	Projection; Introduction to ArcGIS 8; & Editing with ArcGIS;	Handout Chapter 1 (p 7-16); 3 and 6
W 17	HGUG meeting	
W 24	Introduction to ArcGIS 8 II	Chapter 1 (16-28); 2
October		
W 1	Attributes: Giving Meaning to Location: Working With Tables.	Chapter 5
W 8	Analysis I – Measurements; & Project Proposals	
W 15	Analysis II - Neighborhhods: (Nearest Neighbors; Buffers; Thiessen Polygons)	Chapter 8
W 22	Analysis III - Between Coverages: (Union, Intersect, Clip)	Chapter 9
W 29	Analysis IV: Surfaces	Chapter 7
November		
W 5	Projects	
W 12	Analysis V: 3D & Layouts: Getting Analyses out of the Computer	Chapter 4
W 19		
W 26	Thanksgiving	
December		
W 5	Projects	

Primary Text: Theobald, D., GIS Concepts And ArcGIS Methods