

Bio/ES 251

INSTRUCTOR Dr. Ann Throckmorton, Associate Professor of Biology

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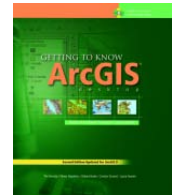
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Office Hours: 9:20 – 10:50 Tuesday
10:30 – 11:30 Wednesday and Friday
or by appointment

CLASS Tuesday, Thursday 11:00 – 12:30 Patterson Hall Computer Lab, PH 214

Attendance in lecture is expected and 5% of your grade in the course will be based on attendance. Because your success in this course is strongly dependent on your attendance and participation, you should make an effort to be present at all class sessions. Absence may be excused for personal emergencies or health-related problems. If you miss class, it is your responsibility to contact me and to obtain lecture notes and assignments that were given during your absence.

REQUIRED MATERIAL Textbook: *Getting to know ArcGIS desktop: Basics of ArcView, ArcEditor, and ArcInfo*, by Tim Ormsby et al., 2001, ESRI Press



COURSE DESCRIPTION

Geographic information systems (GIS) are immensely powerful computer-based tools for mapping and analyzing spatial data. GIS technology allows users to integrate various types of data and to perform common database operations such as query and statistical analysis. This is useful in a wide variety of fields, including biology, environmental science, computer science, geology, social sciences, and business, where professionals are often required to answer questions and solve problems that involve presenting data and information *graphically* and interpreting them *geographically*. This course is designed to introduce the fundamental concepts of GIS and to provide you with experience in using one of the most popular desktop GIS packages -- ArcGIS, from the Environmental Systems Research Institute (ESRI). The course emphasizes hands-on experience with GIS software, utilizing real-world data to illustrate how GIS technology can be used to answer questions and address problems in a wide variety of situations.

PURPOSE OF THIS COURSE

In this course, you will:

1. discover how geographic information systems function and how they can be used to visualize and analyze spatial data;
2. become aware of the nature and characteristics of spatial data and objects and become aware of various sources of data that can be graphed and analyzed using GIS;
3. create and manipulate GIS files and databases;
4. list and define typical GIS operations and become proficient in their use;
5. identify the types of output produced by GIS;
6. gain hands-on experience with ArcGIS 9.1, the industry-standard desktop GIS software.



METHODS OF INSTRUCTION

1. **Assignments:** most assignments will involve hands-on activities to help you become familiar with ArcGIS as a tool for carrying out GIS analysis. During the first half of the semester, most of your time will be spent doing exercises from your textbook, *Getting to know Arc GIS desktop*. Occasionally, you will be given assignments designed to teach fundamental concepts of GIS, GPS, and mapping and to show you how to access and manage different types of GIS data. The assignments are worth 25% of your final grade.
2. **Quizzes:** quizzes will be given after you have completed a number of sections in your textbook. They will be practical, requiring you to use GIS to apply the skills that you have learned by completing the assignments. I will make additional data sets and practice exercises available to you so that you can practice before each quiz. The quizzes are worth 25% of your final grade.
3. **Final exam:** Thursday, May 11, 11:30 a.m.. The largest part of the final exam will be practical. You will be required to locate, manipulate, and analyze data using ArcView. You should be able to apply all of the skills that you learned in the assignments and that you were previously quizzed on. A shorter written portion of the exam will test your knowledge of basic information related to GIS, GPS, and mapping. The final exam is worth 15% of your final grade.
4. **Individual project:** the last part of the semester will be spent working on projects that you will design and complete. This will be your chance to apply GIS to a topic that holds special interest for you. The projects may take many different forms: development of a GIS project using data from commercial or governmental agencies, construction of maps using data that you have gathered, learning a new ArcView extension, development or redesign of a GIS database, development of an on-line GIS using Java or Visual Basic, etc. During the last two weeks of the semester, everyone will present their project to the other members of the class. The project is worth 30% of your final grade. Of that, 25% will be based on the quality of the project that you turn in, 5% will be based on your presentation.
5. **Attendance:** Five percent of your grade will be based on attendance. You will lose 0.5% for each unexcused absence.

GRADES

Grades will be based on five factors, weighted as follows:

Attendance	= 5% of final grade
Assignments	= 25% of final grade
Quizzes	= 25% of final grade
Individual project	= 30% of final grade
Final exam	= 15% of final grade

Your final grade will be based on the following scale:

Above 93%: A	87% - 90%: B+	77% - 80%: C+	67% - 70%: D+	Below 60%: F
90% - 93%: A-	83% - 87%: B	73% - 77%: C	63% - 77%: D	
	80% - 83%: B-	70% - 73%: C-	60% - 73%: D-	

COURSE POLICY ON EXAMS AND ASSIGNMENTS

You must take the quizzes and exams at the scheduled time unless you have talked to me before the day of the quiz or exam and been excused. Valid excuses include such things as serious illness or injury and personal and family emergencies.

Unless otherwise stated, assignments should be turned in by class time on the day that they are due. Late assignments will be accepted but a late penalty will apply; the number of points that are subtracted will vary in proportion to the time elapsed since the due date.

You should turn in all assignments using the Assignments folder on the course r-drive. When you save a file to the r-drive, the name of the file must contain your name and some indication of what it contains (e.g., the name of the file could be "Smith, Assignment 5"). You must save the file to another drive, then save it to the r-drive. If you try to save directly to the r-drive, the network will only write a blank temporary file and you will lose all of your work. Once you have saved something to the Assignments folder you will be unable to retrieve it, open it, or delete it.

ACADEMIC INTEGRITY

Academic integrity is central to the purpose and pursuit of any academic community. In this class, I expect you to adhere to the principles of academic integrity stated in the [Westminster College handbook](#) and to maintain the highest standards of academic honesty and integrity, in keeping with the philosophy and purposes of the College.

"Academic dishonesty is a profound violation of this expected code of behavior. It can take several forms, including, but not limited to, plagiarism, cheating, purposely altering the work of another (without that person's permission), misrepresentation of attendance in class or at a College event, misrepresentation of work, facts or experimental results, unauthorized use of or intentional intrusion into another's computer files and/or programs, intentional damage to a computer system, unauthorized use of library materials and privileges, or engaging in any activity which attempts to alter or harm another's academic standing."

TENTATIVE SCHEDULE OF TOPICS

The course will follow the schedule below, with latitude for amplification and digression. All exercises are in your textbook, *Getting to Know ArcGIS desktop*.

DATE	TOPIC	READING
01/19	Introduction to the course; What is GIS? Introducing GIS	chapter 1
01/24	Quiz #1, chapter 1 Introducing ArcGIS desktop Exploring ArcMap Exploring ArcCatalog	chapter 2 chapter 3 chapter 4
01/26	Symbolizing features and rasters	Chapter 5
01/31	Classifying features and rasters	Chapter 6
02/02	Quiz #2, chapters 1 - 6 Labeling features	Chapter 7
02/07	Querying data	Chapter 8
02/09	Joining and relating tables	Chapter 9
02/14	Selecting features by location Preparing data for analysis	Chapter 10 Chapter 11
02/16	Analyzing spatial data	Chapter 12
02/21	Quiz #3, chapters 7 – 12	
02/23	Review Quiz #3	
02/28	Practice to retake Quiz3 Projecting data in ArcMap	Chapter 13
03/02	Retake Quiz #3	
03/07	Introducing coordinate systems Building geodatabases	Chapter 14
03/09	Creating features Editing features and attributes	Chapter 15 Chapter 16
03/11 – 03/21	<i>Spring break</i>	
03/23	Geocoding addresses Review for Quiz #4	chapter 17
03/28	Quiz #4, chapters 13 - 16	
03/30	Making maps quickly Making maps for presentation	Chapter 18 Chapter 19
04/04	Quiz #5, chapter 17 - 19	
04/06	Work on projects Submit project proposal	
04/11 – 04/25	Work on projects	
04/27	Project presentations	
05/02	Project presentations	
05/04	Project presentations Final projects due	
05/09	Reading Day	
05/11, 11:30	Final exam	

