Course Title: **Introduction to Geographic Information Systems**
Cross-listed as GEO250 & ENS250 (4 Credit)

Prerequisites: *none*

Class Meeting Time & Location: T/TH, 10:30 a.m. - 12:10 p.m., McMichael 320

Instructor: **Ryan Kirk**, Dept of History and Geography, Dept of Environmental Studies
rkirk2@elon.edu (e-mails will be responded to within 24 hours)
Office: 112A Lindner Hall
Work: 336-278-6477; Cell: 612-280-7157

Office hours:
M 3:30 – 4:30 p.m. *(in the lab)*
T 1:30 – 2:30 p.m. (in 112A Lindner)
W 10:00 – 11:00 a.m. (in 112A Lindner)
Th 3:00 – 4:00 p.m. (in 112A Lindner)
(*or by appointment)*

Course Web site: We will use **blackboard** extensively for communication, submission of assignments, and grading. For help getting established on blackboard see: https://blackboard.elon.edu/ → look for the "BB Help" tab at the top of the page

Required Text: **GIS Fundamentals, 3rd Edition, 2008, Paul Bolstad**
We will draw extensively from this book for theory and exam material. A copy of the book is on reserve at the front desk in Belk Library and available for 2-hour loans.

Course Overview: Introduction to GIS, focusing on spatial data development and analysis. Topics covered include basic data structures, data sources, data collection, data quality, geodesy and map projections, spatial and tabular data analyses, digital elevation data and terrain analyses, and cartographic layout. Laboratory exercises provide practical experiences that complement the theory covered in lecture.

Course Objectives:
1) Appreciation for GIS and the complexities of GIS analysis
2) Understanding of core GIS concepts, data sets and tools
3) Competency in use of the ArcGIS 9.3 software package
4) Resourcefulness in geospatial problem solving

General Course Structure: GIS is a software tool, but it is easy to make errors and produce false results. Thus, this class is designed around developing a sophisticated balance of hands-on technical experience and theoretical understanding of GIS. The structure will be fairly direct. We will introduce new topics each week and conduct labs relating to the material. In general, each day will consist of 30-45 minutes of lecture/discussion, and 45-60 minutes of lab time.

Grades: There are 500 points available in this course:

Component	Pts	Percentage of Final Grade
Mid-term exam (2 @ 50 pts each)	100	20%
Final exam (partially cumulative; includes practicum)	100	20%
Labs (10 @ 20 pts each)	200	40%
Final Project (individual or groups up to 3 people)	100	20%
Total	500	100%

You can track your grade by adding up the points and dividing it by the total possible points available to date. This table shows the final grade thresholds:

Points Earned	Letter Grade	Equivalent Percent	Points Earned	Letter Grade	Equivalent Percent
465 – 500	A	93.0 – 100.0	365 – 384	C	73.0 – 76.9
450 – 464	A-	90.0 – 92.0	350 – 364	C-	70.0 – 72.9
435 – 449	B+	87.0 – 89.9	335 – 349	D+	67.0 – 69.9
415 – 434	B	83.0 – 86.9	315 – 334	D	63.0 – 66.9
400 – 414	B-	80.0 – 82.9	300 – 314	D-	60.0 – 62.9
385 – 399	C+	77.0 – 79.9	0 – 299	F	0.0 – 59.9

Attendance Policy: As this is a content and application driven course, attendance will not be required except on exam and presentation days. This simply means that it is your responsibility to learn the material and complete the assignments. Lecture slides and handouts will be uploaded to Blackboard.

Exams: The 2 mid-term exams will be designed to cover theoretical concepts of GIS. They will be based primarily on the book and supplemented with in-class material. The exams are designed for 60 minutes, but the full 100 minutes will be available**.** All exams will consist of a combination of T/F, multiple choice, short calculation, and short answer questions. The 2nd mid-term and final exam will be partially cumulative. The Final is will also contain a practicum portion for which you will have to complete a GIS task using the software. A list of topics for each exam will be provided at least one week in advance.

Labs / Exercises (10): A total of 10 regular labs will be completed during the semester. These labs are designed to illustrate core topics discussed in lectures as well as learn the technical skills of GIS. Labs will typically consist of solving a specific problem using ArcGIS 9.3, generating one or more outputs maps, and answering critical review questions related to the topic and pertinent book content. Labs are to be submitted electronically.

Final Project: Students are given the choice of a final project, with the general requirement that it have an analysis component (i.e., not just data development). You can work as an individual or in groups of up to 3. It is preferred that you conduct an applied project for the University, local community, or some other organization, but this is not required. The project, which should consist of about 30-40 hours work per student, will require creating or acquiring digital data, manipulating attribute data, performing spatial analyses, and producing output maps and charts. The final products for individuals will consist of a 1500-2000 word report that includes at least 6 citations and 3 presentation quality maps, plus a 5-6 minute presentation. For groups, the requirements are a 2000-3000 word report with at least 10 citations and 5 presentation quality maps, plus an 8-9 minute presentation.

Grading Policies:

Overall grading is criterion-referenced, in which grades are designed to measure how well students perform relative to predetermined standards. Grades follow the traditional scale and the traditional thresholds are guaranteed: (e.g., > 93% = A, 90-93% = A-, etc). No individual assignments will be curved, but the final grades may be curved upwards (never downwards) at the discretion of the instructor. Historically, there has rarely been a curve for this course.

Bonus Points may be added on any of the assignments at the discretion of the instructor, based on any of the following criteria that indicate an "above-and-beyond" effort or quality-level: 1) professional presentation, 2) clarity of argument/presentation, or 3) thoroughness of argument/presentation. Thus, a grade greater than 100% is possible.

Grades on each assignment can be contested to the instructor up to 2 weeks after the assignment is returned for errors or perceived injustice. Send an e-mail or bring a written statement to office hours containing sound reasons why a grade should be changed.

Incomplete grades are assigned at the discretion of the professor when, due to extraordinary circumstances, e.g., hospitalization, a student is prevented from completing the work of the course on time. Requires a written agreement between the professor and student *before* the final exam.

Submitting Assignments: Due dates for assignments are listed on the course schedule (below). **Lab and written assignments are due before the start of class on the due-date.** Assignments are to be submitted in electronic format barring explicit directions to the contrary or previously arrangement. Assignments will be submitted electronically via Blackboard. A separate sheet for instructions and requirements will be provided.

Late Assignments: Extensions on assignments may be granted if requested in advance with appropriate justification. **Without an approved extension, assignments may be submitted up to 3-days late for 80% partial credit, or up to 7-days late for 60% partial credit**. Assignments will not be accepted later than 7 days after the due date without an approved extension. Exams may be rescheduled if arrangements are made at least 1 day prior to the date, but no exams can be made up without prior notification.

Academic Integrity Policy: Students are expected to abide by the Elon Academic Honor Code (available at http://www.elon.edu/e-web/students/handbook/honorcpp.xhtml). Alleged violations will be dealt with according to University policy.

Special Assistance: Please inform the professor of any special needs for accessibility and learning, and appropriate measures will be taken to aid success in the course. If you are a student with a documented disability who will require accommodations in this course, please register with Disabilities Services in the Duke Building, Room 108 (278-6500) for assistance in developing a plan to address your academic needs.

How to succeed in this course

Your grade is weighted as approximately 50% theory (exams and theory questions on labs) and 50% applied technical projects (which often require understanding of the theory). The main key to success is self-motivation and consistent effort on both components. Keep up on the readings, keep organized notes, and critically reflect on how the assignments support the theory. You can often identify answers on the exams by relating the material to the lab work.

Note: If any changes are required to this schedule, multiple announcements will be made in class and via Blackboard announcements, and an updated schedule will be posted on Blackboard in the "Syllabus" folder.

Schedule

Week	Topic	Readings	Due Items / Notes
Week 1			
Tue Feb 1	Introduction		
Th Feb 3	***Lab 1**: Map making*	Ch 1	
Week 2			
T Feb 8	Data Models and Generalization	Ch 2	*Lab 1 due before class*
Th Feb 10	***Lab 2**: More basic functionality*		
Week 3			
T Feb 15	Geodesy & coordinate systems,	Ch 3	*Lab 2 due before class*
Th Feb 17	***Lab 3:** Map Projections & Coordinate Systems*		**** Instructor off campus at a conference***
Week 4			
T Feb 22	GPS	Ch 5	*Lab 3 due before class*
Th Feb 24	***Lab 4:** GPS exercise*		
Week 5			
T Mar 1	***Midterm 1***		
Th Mar 3	Data Entry, Lab 5/6 ***Lab 5/6:** Georegistration & Digitizing*	Ch 4	*Lab 4 due before class*
Week 6			
T Mar 8	*Lab 5/6*		
Th Mar 10	*Lab 5/6*		
Week 7			
T Mar 15	Remote Sensing	Ch 6	*Lab 5/6 due before class*
Th Mar 17	***Lab 7**: Satellite Image Classification*		
Week 8	***Spring Break***		
Week 9			
T Mar 29	Attributes & databases	Ch 8 (only pp. 291-206)	*Lab 7 due before class*
Th Mar 31	***Lab 8:** Demographic Analysis*		***Project Proposal due, midnight***
Week 10			
T Apr 5	National Data Sources	Ch 7	*Lab 8 due before class*
Th Apr 7	***Midterm 2***		
Week 11			
T Apr 12	Spatial Analysis	Ch 9 & Ch 13 (only pp. 477-496)	
Th Apr 14	***Lab 9:** Overlay and buffering*		
Week 12			
T Apr 19	Raster Analysis	Ch 10/11	*Lab 9 due before class*
Th Apr 21	***Lab 10**: Cost surface analysis*		
Week 13			
T Apr 26	Group exercise: cartographic modeling Project work	Ch 14	*Lab 10 due before class*
Th Apr 28	*No Class; SURF week (attend Wed classes)* *Project work*		
Week 14			
T May 3	Project work		
Th May 5	Presentations		
Week 15			
T May 10	Course wrap up		**Final project paper due before class**
Th May 12	**Final Exam: 8:00-11:00 a.m.**		Exam can only be rescheduled based on hardship as defined by University policy *List of book sections and topics on exam will be provided 2 weeks in advance.*