# GGS 553: Geographic Information Systems
## Course Syllabus, Spring 2016, 3 Credits

### INSTRUCTOR


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### COURSE BASICS

Meeting times: Monday, 7:20–10pm
Location: 2310 Exploratory Hall
Web location: Blackboard
Office hours: Tues 4-6pm, Thur 1-3pm, or by appt

### REGISTRATION DATES

Drop without tuition penalty: January 26, 2016
Drop with tuition penalties: January 27 – February 19, 2016

### PREREQUISITE

GGS 550 - Geospatial Science Fundamentals

GGS 550 covers material such as coordinate systems, datums, projections, data acquisition, and spatial data formats

### REQUIRED TEXT

Bolstad, P. 2012. GIS Fundamentals: A First Text on Geographic Information Systems (Fourth Edition). Eider Press, White Bear Lake, MN. ISBN: 978-0-9717647-3-6

Available at the GMU Bookstore or order online at www.atlasbooks.com

### OTHER REQUIREMENTS

USB thumb drive or some other form of portable (or easily accessible) storage device/service (1 Gb minimum)

### OVERVIEW & OBJECTIVES

GGS 553 provides an introduction to Geographic Information Systems (GIS), a set of hardware, software, and methods that can be used to collect, store, display, model, and analyze geographic information and spatial data. The goal of this course is to provide students with a firm understanding of the conceptual, technical, and practical issues affecting the use of geographic information within a variety of applications. Weekly class meetings include both lecture and discussion of basic concepts, as well as in-class demonstrations and exercises. Weekly labs will be application-driven, focusing on the material covered in the lectures and readings.

### ASSIGNMENTS & EXPECTATIONS

Lab exercises will be based on the lecture material previously delivered and available on Blackboard. Each lab exercise will be assigned during class and will be due one week after it is assigned at the start of the lecture. Late submissions will be penalized 20% per day. The only exceptions will be for the usual *documented* medical reasons or by *previous agreement* with the instructor.

### GRADING SCHEMA

| **Assessment** | **Points** | **%** (of final grade) |
|---|---|---|
| Lab Exercises (11) | 500 | 50% |
| Midterm Exam | 200 | 20% |
| Lab Final Exam | 100 | 10% |
| Final Exam | 200 | 20% |

Grades will be based on the following cutoff values, although I reserve the right to alter the exact values at the end of the semester: A (93%), A- (90%), B+ (87%), B (83%), B- (80%), C (70%)

The midterm exam will cover the first 7 weeks of the course. The final exam will be semi-comprehensive, focusing on the final 6 weeks of the course, but also covering key topics from throughout the entire semester.

There will be 3-4 *ungraded* pop quizzes throughout the semester. These quizzes will be used to evaluate how well the course information is being presented and retained; they will also provide an opportunity to preview potential exam questions.

**OUTLINE & SCHEDULE** (subject to change)
*note: the Lab dates below refer to the date they will be assigned!*

| Date | | Lecture Topics | Readings / Assignments |
|---|---|---|---|
| 1/25 | M | Introduction to GGS 553<br>GIS History and Components<br>Spatial Cognition | Chp 1, Chp 4 (p 131-140)<br>Lab #1: Intro to Data Management and ArcGIS |
| 2/1 | M | Projections and Coordinate Systems<br>Map Design | Chp 3, Chp 4 (p 164-170), Chp 9 (p 359-366)<br>Lab #2: Projections and Maps |
| 2/8 | M | Spatial and Attribute Data Structures | Chp 2, Chp 8 (p 307-320)<br>Lab #3: Vector and Raster Data |
| 2/15 | M | Data Collection and Creation | Chp 4 (p 140-164), Chp 5 (p 183-194), Chp 7<br>Lab #4: Creating Data |
| 2/22 | M | Metadata and Data Quality | Chp 4 (p 171-175), Chp 14<br>Lab #5: Working with Existing Data |
| 2/29 | M | Query, Describe, and Summarize<br>Distance and Buffer | Chp 9 (p 347-358, 368-376), Chp 10 (p 407-418, 434-437)<br>Lab #6: Introduction to Spatial Analysis |
| 3/7 | M | No Class, Spring Break | |
| 3/14 | M | Vector and Raster Overlay<br>Review for Midterm Exam | Chp 9 (p 377-389), Chp 10 (p 407-423)<br>Lab #7: Overlay Analysis |
| 3/21 | M | **MIDTERM EXAM** | |
| 3/28 | M | Cartographic Modeling<br>Decision Support | Chp 13<br>Lab #8: Cartographic Modeling |
| 4/4 | M | Neighborhood Operations<br>Introduction to Spatial Statistics | Chp 10 (p 424-433), Chp 12 (p 499-502), *TBD*<br>Lab #9: Neighborhood Operations |
| 4/11 | M | Network Analysis | Chp 9 (p 390-396), Delamater et al. 2012<br>Lab #10: Network Analysis |
| 4/18 | M | Terrain Analysis | Chp 11<br>Lab #11: Terrain Analysis |
| 4/25 | M | Spatial Interpolation | Chp 12 (p 473-498)<br>**LAB FINAL EXAM** |
| 5/2 | M | Pattern Analysis<br>Review for Final Exam | *TBD* |
| **5/9** | M | **FINAL EXAM** | |

**ACADEMIC INTEGRITY**

GMU has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions.

**GMU EMAIL ACCOUNTS**

Students must use their MasonLive email account to receive important University information, including messages related to this class. See http://masonlive.gmu.edu for more information.

**OFFICE OF DISABILITY SERVICES**

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474, http://ods.gmu.edu. All academic accommodations must be arranged through the ODS.

**RESOURCES**

The Writing Center: http://writingcenter.gmu.edu

University Libraries, Ask a Librarian: http://library.gmu.edu/ask

Counseling and Psychological Services: http://caps.gmu.edu

University Catalog: http://catalog.gmu.edu

University Policies: http://universitypolicy.gmu.edu