

GGIS 311-002: Introduction to Geographic Information Systems (3 credits)

Fall 2022

Class Time: Mondays and Wednesdays (10:30am to 11:45am)

Location: Exploratory Hall, Room 2312

Instructor: Nana Ama, Obeng Nti (nobengnt@gmu.edu)

Office hours: Fridays 1pm – 2pm or by appointment via Blackboard Collaborate Ultra

COURSE DESCRIPTION

This course is an introduction to geographic information systems (GIS) with emphases on the fundamental scientific principles, theories and techniques associated with GIS. During the course of the semester, students will learn principles of GIS, GIS data types, geographic data modelling and collection, cartography and map production, georeferencing and projections, and spatial analysis through lectures, lab assignments and tests.

LEARNING OBJECTIVES

Upon completion of this course, students will

- Understand the fundamental scientific theories, principles, and techniques of geographic information system.
- Apply and demonstrate key concepts of spatial analysis.
- Identify problem parameters, characterize data needs, assemble data, and perform analysis with GIS.
- Effectively communicate results of research and analysis using maps and graphics produced with GIS software packages.

REQUIRED TEXTBOOK

GIS Fundamentals: A First Text on Geographic Information Systems, 6th Ed., Bolstad, Paul. Eider Press 2019.

TECHNOLOGY REQUIREMENTS

- **Hardware:** You will need a computer with at least 2 GB of RAM and access to a fast and reliable broadband internet connection.

- **Blackboard:** All course materials will be uploaded on the course website on blackboard. To access blackboard, you will need a browser and an operating system that are compatible or certifies with Blackboard version available on **myMason Portal**.

- **ArcGIS Pro:** *ArcGIS Pro (ArcPro)* will be used to complete all lab assignments for the course. Students can access the software either by installing on your personal computer, via a virtual student computing lab or through the computer labs on campus. Installing ArcPro on your personal computer will require administrator-level access and control of a Windows PC computer. If you choose to access *ArcPro* via Citrix Virtual Lab, VPN installation and access will be required.

Details on how to access *ArcPro* on the course website on Blackboard.

Note: *ArcPro* only runs on Windows computers, hence Macs and Linux users will have to opt for the Citrix Virtual Labs option or set up your Mac with Boot Camp or virtualization software so Windows will run on it. Linux computers can also be configured with virtualization software or configured to dual boot with Windows.

- **Lockdown Browser:** All exams will be taken using Lockdown Browser. Instructions on how to download and install the Lockdown Browser can be found on the **home page of myMason portal**.

ASSESSMENTS

- **Labs (50% of course grade; not equally distributed across exercises):** There will be 11 labs assigned to this course. The labs are based on Bolstad's labs but are tailored for this class. Lab exercises will be available for download on Blackboard. You may complete the exercises in class during lab days listed on the syllabus, in the GGS Computer Lab and/or at home. You should read the lab in advance, and review/note new procedures or activities. Labs will require more than the 1.25-hour class period to complete.

All labs assignments are to be submitted via Blackboard under the specific lab session. **Labs will not be accepted via Email.** Labs must be submitted as **pdf. or MS Word document.** Late labs

will be penalized 5% for each day, and will not be graded after two weeks. **Labs are due 11:59pm of their due dates listed on the course schedule.**

- **Exams (50%):** There will be three exams for this course. Exams #1 and #2 will cover chapters 1-5 and 6-9 respectively, with each accounting for 15% of your exams grade. The final exam will be comprehensive of everything learnt through out the semester. This will account for 20% of your exam grades. There will be no practical exams.

- **Incomplete:** Incomplete will be handles strictly according to the University policy. Makeup tests are not given unless under unusual circumstances such as serious illness. Proof (documentation) is necessary to be eligible for makeup tests. No early exams will be given.

TENTATIVE COURSE SCHEDULE (SUBJECT TO CHANGE)

Week	Monday	Wednesday	Lab Due Dates
Week 1: Aug 22 & 24	Course/Lab Introduction Chapter 1: Intro to GIS	Lab 1: Intro to ArcPro	Lab 1: Aug 28
Week 2: Aug 29 & 31	Chapter 2: Data Models	Lab 2: Projections	Lab 2: Sep 4th
Week 3: Sep 5 & 7	Labor Day – No Class	Chapter 3: Geodesy, Datums, Map Projections, Coordinate Systems	
Week 4: Sep. 12 & 14	Chapter 4: Maps, Data Entry, Editing & Output	Lab 3: Digitizing	Lab 3: Sep 18
Week 5: Sep. 19 & 21	Chapters 5-6: Global Satellite Navigation & Aerial/Satellite Images	Exams #1 (Chapters 1-5)	
Week 6: Sep. 26 & 28	Chapter 7: Digital Data	Lab 6: Digital Data	Lab 6: Oct 2
Week 7: Oct. 3 & 5	Chapter 8: Attribute Data & Tables.	Lab 7: Tables.	Lab 7: Oct 9
Week 8: Oct 10 & 12	Fall Break – No Class	Chapter 9: Basic Spatial Analysis Lab 8: Spatial Selection	Lab 8: Oct 16
Week 9: Oct. 17 & 19	Exams #2 (Chapters 6 - 9)	Lab 9: Buffering & Overlay	Lab 9: Oct 30th
Week 10: Oct. 24 & 27	Chapter 10: Raster Analyses	Lab 10: Topics in Raster Analysis	Lab 10: Nov 6th
Week 11: Oct. 31 & Nov 2	Chapter 11: Terrain Analyses	Lab 11: Terrain Analysis	Lab 11: Nov 13
Week 12: Nov. 7 & 9	Chapter 12: Spatial Estimation	Lab 12: Interpolation	Lab 12: Nov 20
Week 13: Nov. 14 & 16	Chapter 13: Spatial Models & Modeling	Lab 13: Intro to Cartographic Modeling	Lab 13: Nov 27

Week 14: Nov. 21 & 23	Chapter 14: Data Standards & Data Quality	Thanksgiving Break – No Class	
Week 15: Nov 28 & 30	Chapter 15: New Developments in GIS	Exam Review	
Dec 5	Reading Day		
Dec 7	Final Exams		

GRADING SCALE

LETTER GRADE	PERCENTAGE
A+	>99
A	93 - 98.9
A-	90 – 92.9
B+	87 – 89.9
B	83 – 86.9
B-	80 – 82.9
C+	77 – 79.9
C	73 – 76.9
C-	70 – 72.9
D	60 – 69.9
F	0 – 59.99

UNIVERSITY POLICIES AND RESOURCES

- A. Academic Honesty: You are expected to be familiar with and abide by the University’s Honor Code. The Code can be found [here](#). It is your responsibility to see me if you have questions about these policies. George Mason University has an honor code that states the following:

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the University Community have set forth this:

- B. Course materials and student privacy: All course materials posted to Blackboard or other course site are private; by federal law, any materials that identify specific students (via their name, voice, or image) must not be shared with anyone not enrolled in this class. Video recordings of class meetings that include audio or visual information from other students are private and must not be shared. Live Video Conference Meetings (e.g. Collaborate or Zoom) that include audio or visual information from other students must be

viewed privately and not shared with others in your household. Some/All of our synchronous meetings in this class will be recorded to provide necessary information for students in this class. Recordings will be stored on Blackboard [or other secure site] and will only be accessible to students taking this course during this semester.

- C. Students must follow the university policy for [Responsible Use of Computing](#)
- D. Student services: The University provides range of services to help you succeed academically and you should make use of these if you think they could benefit you. I also invite you to speak to me (the earlier the better).
- E. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- F. [The George Mason University Counseling and Psychological Services \(CAPS\)](#) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance. Counseling Center: Student Union I, Room 364, 703-993-2380.
- G. Students with disabilities who seek accommodations in a course must be registered with the [George Mason University Office of Disability Services \(ODS\)](#) and inform their instructor, in writing, at the beginning of the semester. All academic accommodations must be arranged through that office. Please note that accommodations **MUST BE MADE BEFORE** assignments or exams are due. I cannot adjust your grade after the fact.