Department of Geography & GeoInformation Science

GGS 311-002 Introduction to GIS | Spring 2019

Name	:	Maction Komwa, PhD	Meeting Times	:	TR | 3:00 pm – 4:15 pm
Office	:	Exploratory Hall, Room 2414	Location	:	Exploratory Hall, Room 2310
Email	:	mkomwa@gmu.edu	Office hours	:	MW | 1:30 pm – 3:00 pm
Phone	:	703-993-5646	Credits	:	3.000

Contact GIS Learning Assistants
GIS Learning Assistant: James Fishel, email: jfishel@masonlive.gmu.edu | Adam Black, email: ablack14@masonlive.gmu.edu
Office: GGS Cubicle Office Space or GIS Lab
Office hours:

Required Textbook:
Paul Bolstad. 2012. *GIS Fundamentals: A First on Geographic Information Systems*. 4th or 5th Edition, Eider Press, Minnesota.
Textbook website: http://www.paulbolstad.net/gisbook.html

Course description
Course Description: This course is designed as an introduction to geographic information systems and focuses on the associated fundamental scientific principles, theories, and techniques. Students will learn how the Earth's features are modeled and stored in a computer information system. Students will learn how to use geographic information systems to answer geographic questions and how to perform simple analytical procedures using geographic data. Students will formulate a research proposal around a scientific question, adopt appropriate GIS-based methodology, collect geographic data, conduct analysis, and prepare a summary and evaluation of findings.

Course objectives
By the end of this course, students will be able to:

a. Demonstrate a broad knowledge-base of the fundamental scientific theories, principals and techniques of Geographic Information System.
b. Demonstrate an understanding of the societal context of GIS, and articulate important historical events, contemporary developments, and future trends that shape GIS.
c. Apply and demonstrate key concepts of spatial analysis using commercial GIS software.
d. Given a specific problem, identify problem parameters, characterize data needs, assemble data, and perform analysis with GIS.
e. Effectively communicate results of research and analysis using maps and graphics produced with GIS software packages.

Activities

You will achieve these goals through attending the course lectures, reading the textbook, participating in class discussion, successfully completing lab exercises, quizzes and exams.

Exams:

There will be three exams [**Exam I and Exam II**]. Questions will come from the concepts covered in class. Exams will consist of multiple choice, fill-in the blank and short answer questions. Make-up Exam will not be given without supporting documents or university approved excuse absences.

Lab Activities:

You will be requested to complete lab exercises and submitting lab reports. Lab sessions will be conducted prior to the assigned labs and it is your responsibility to attend to these lab sessions. The GIS Learning Assistant including myself will be present to guide you the process of these lab activities. We will use ArcGIS software installed in the classroom computers plus the GIS Lab. If you need ArcGIS for Student Use, please let us know. Data for all the Labs will be posted through the Blackboard in the Assignment Folder. 40% of your total grade will come from these Lab sessions so your presence to lab sessions is highly encouraged. Do not hesitate to ask your GIS Learning Assistant and your Instructor if you encounter a problem. Use our designated Office hours! They are free!

Labs are only accepted through the Blackboard course site – NOT through Emails! Labs are to be submitted as *.jpg, MS Word, typed text, or *.pdf. Please do not send, submit, or attach *.mdx or shapefiles.

Each student must bring a small USB flash drive with 1 Gig + of free space. All class exercise and data should be saved to this drive.

Final Project:

You will work in pairs to complete a GIS Project. Project description, data source, time frame, and deliverables will be posted through the GMU Blackboard website in the Assignment Folder. The course project will build on the underlying scientific knowledge gained in the course and the GIS skills acquired through the lab exercises. At the end of the semester, your group will make a powerPoint presentation and a brief report with clear project problem statement, methodology, geographic data collection, GIS-based analysis, summary and final presentation. Additional information will be posted through the Blackboard.

Focus of instruction:
This course is divided into two important main parts: lectures, which will introduce the theory of geographic information systems (GIS), and lab assignments, which will help you to familiarize yourself with many aspects of the software. We will discuss the GIS concepts, data, tools, and GIS applications through case studies during our lecturers. The laboratory sessions will introduce the geospatial data and software tools that you will require in order to finish your lab exercises. You don't need to be a computer "guru" to complete your lab assignments, but all lab exercises will require a very basic level of computers and Windows operating system. GMU is resourceful enough for students to get these computer skills.

Grading Scale

Grade	Percentage	Grade	Percentage	Grade	Percentage	Grade	Percentage
A+	98 -100%	B+	87 – 89%	C+	78 – 79%	F	below 60%
A	93 -97%	B	83 – 86%	C	70 – 77%		
A-	90 -92%	B-	80 – 82%	D	60 – 69%		

Summary

- Lab x 10 [40%]. – Lowest lab grade will be dropped (Only 9 Labs will contribute to your final grade)
- Exam I 10%
- Exam II 15%
- Final Project Presentation 10%
- Final Project Paper 15%
- Practice Quizzes 5%
- Class Activities and Participation 5%

Late Policy
You should complete all assignments by due date. There will be no make-up on Quizzes and Exams unless accompanied by compelling evidence or in the case of **University-excused absences.**

Late Lab Assignments will be penalized at 5 points per day. Activities more than 5 days late automatically receive zero points. If you submit your assignment past the deadline even if it is 1 minute late, I will consider that as late submission, so you should plan your time accordingly.

Classroom Expectations:

Students are expected to be on time for class. Regular attendance is strongly recommended.

1. Should circumstances arise that make you late, do not disrupt the class as you enter, take the first available seat and do not walk across the room.
2. In the event of any class cancellation, including inclement weather (e.g. snow), the class will resume where we left off, adjustments, if necessary, will be made later.
3. For each hour of in-class time you should anticipate three hours to complete out-of-class work and preparation.
4. Cell Phones and pagers must be turned off during class. Zero tolerance!

Academic Honesty: George Mason University operates under an honor system, which is published in the University Catalog and deals specifically with cheating, attempted cheating, plagiarism, lying, and stealing. Please familiarize yourself with the honor code, especially the statement on plagiarism (http://www.gmu.edu/org/honorcouncil/guidelines.htm).

I will respond to acts of academic misconduct according to university policy concerning plagiarism. In such cases Plagiarism will result in a failing grade of the assignment in question and/or for the course. Make sure you check the instructions through the Blackboard on how to write your term papers. If you have questions about when the contributions of others to your work must be acknowledged and appropriate ways to cite those contributions, please talk with the professor.

University Services

George Mason University has a number of academic support and other resources to facilitate your success. Some of these resources are presented below:

i. Counseling and Psychological Services [http://caps.gmu.edu/]
ii. Learning Services, University Career Services [http://careers.gmu.edu/]
iii. Writing Center [http://writingcenter.gmu.edu/] and other Learning Services within GMU.
iv. University Catalog: http://catalog.gmu.edu/ |
v. University Policies: http://universitypolicy.gmu.edu/

Absences & Accommodations

Students are expected to attend all classes and to complete all assignments on time. Absences may have an adverse effect on grades in a course including failure.
Excused absences: In certain circumstances, absences may be excused. These include:

- **Absence for religious observances:** Students must notify their professors in writing at the beginning of the semester of religious observances that conflict with classes. Students who cannot be accommodated should discuss the matter with a dean.
- **Absence for athletic travel:** Student-athletes must provide their professors with a travel letter at the beginning of the semester which highlights potential absences. Students who cannot be

accommodated for some or all absences should discuss the matter with the relevant Academic Coordinator for Student-Athletes.

- **Absence for documented illness:** Students who miss multiple classes due to prolonged illness should seek medical care and provide documentation of such to the Dean's Office, which will communicate with the student's professors. A prolonged absence may necessitate the student's withdrawal from the course or from the University for the semester.
- **At the discretion of the professor:** There may be cases where an absence is undocumented but is, nevertheless, excused by the professor (e.g., absence due to a death in the family). Students should initiate a conversation with their professors about the nature and duration of the absence, in advance of the absence whenever possible.

When absences are excused, students remain responsible for all assigned work, and shall be provided with the opportunity to make up, without penalty, any work that they have missed.

Students with Disabilities

Students with documented and qualifying learning, physical and psychological disabilities should contact the Disability Services (ODC), which arranges for reasonable accommodations in accordance with the Americans with Disabilities Act and University policies. In order to arrange accommodations in each course, the student must present his/her professors with a letter from the ODC outlining the recommended accommodations at the beginning of the semester. Disability Services (ODC) website: http://ods.gmu.edu/] / Student Union Building I (SUB), Room 2500. Telephone: (703) 993-2474.

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking:

As a faculty member, I am designated as a "Responsible Employee," and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per University Policy 1412. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (703-380-1434) or Counseling and Psychological Services (CAPS) (703-993-2380). You may also seek assistance from Mason's Title IX Coordinator by calling 703-993-8730 or emailing cde@gmu.edu.

COURSE SCHEDULE

*This Schedule is subject to change. Any changes will be announced over email & Blackboard

Date	Lecture and Lab Topics	Readings
01/22	Introductions and Course Overview	None
01/24	GIS History & Concepts	Chapter 1
01/29	Introduction to ArcGIS Software and Data Sources	Chapter 1
01/31	Data Models I	Chapter 2
02/5	Data Models II	Chapter 2
02/7	Map Projections & Coordinate Systems I	Chapter 3
02/12	Map Projections & Coordinate Systems II	Chapter 3
02/14	Maps, Data Entry & Editing I	Chapter 4
02/19	Maps, Data Entry & Editing II Exam Review	Chapter 4
02/21	**EXAM I [***Chapters 1-4[*	-
02/26	Working with attribute data and tables	Chapter 8
02/28	Working with attribute data and tables	Chapter 8
03/5	Database Creation: Digitizing and Georeferencing	
03/7	Overview of Basic Spatial Analysis	Chapter 9
03/11-03/17	**Spring Break**	
03/19	Basic Spatial Analysis I - Querying data in vector GIS	Chapter 9
03/21	Basic Spatial Analysis II – Geoprocessing in vector GIS: overlay, clip, buffer	Chapter 10
03/26	Raster Analysis I	Chapter 10
03/28	Raster Analysis II	Chapter 10
04/2	GPS Field Exercise	-
04/4	Map Creation using GPS Field data	-
04/9	*Group Project Discussion*	-
04/11	Digital Data I	Chapter 7
04/16	Digital Data II	Chapter 7
04/18	Map Design and Cartography | *Exam II Review*	-

Date	Topic description	Readings
04/23	**EXAM II [***Chapters 7- 10*]	
04/25	Work on Group Project	
04/30	Group Presentation I	
05/1	Group Presentation II	
	Submit your Final Group Paper – 5/5 [11:59 pm]	

Instructions on ***ALL Lab Assignments, Quizzes*** due dates will be posted through the Blackboard. You should always check the Blackboard. All Lab Assignments due at 11:59 pm.