Geography and Geoinformation Science

MASON IMPACT

COURSE SYLLABUS
Introduction to Geographic Information Systems
GGS 311-DL1
Spring 2020

FACULTY CONTACT INFORMATION:

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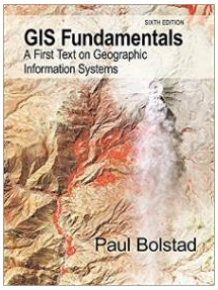
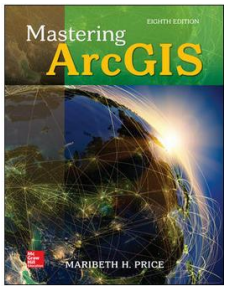
Required Textbook:



Paul Bolstad. 2019. *GIS Fundamentals: A First on Geographic Information Systems.* 6th Edition, Eider Press, Minnesota.

Textbook website: http://www.paulbolstad.net/gisbook.html

GIS Exercises Textbook



Mastering ArcGIS
8th Edition
By Maribeth Price
ISBN10: 1259929655
ISBN13: 9781259929656
Copyright: 2019

[This textbook provides step-by-step approach with specific assigned tasks that you will be involved in the application of GIS concepts and learning sophisticated ArcGIS software]

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 Prerequisites

There are no formal prerequisites. Some students may find GGS 110 (Maps and Mapping) useful, but it is not required.

Credit Hours for this course: 3

Course objectives

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

- Demonstrate a broad knowledge base of the fundamental scientific theories, principals and techniques of Geographic Information System.
- Demonstrate an understanding of the societal context of GIS, and articulate important historical events, contemporary developments, and future trends that shape GIS.
- Apply and demonstrate key concepts of spatial analysis using commercial GIS software.
- Given a specific problem, 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.

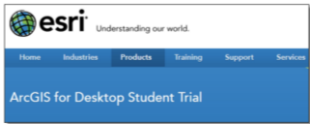
Technology Requirements & Expectations

- You will need access to a Windows or Macintosh computer with at least 2 GB of RAM or more and to a fast and reliable broadband Internet connection (e.g., cable, DSL).
- A larger screen is recommended for better visibility of course material.
- You will need speakers or headphones to hear recorded content and a headset with a microphone is recommended for the best experience.
- For the amount of Hard Disk Space required to take a distance education course consider and allow for:
    - the storage amount needed to install any additional software and your GIS work also will need adequate space storage.
- **Data Storage:** GIS work requires a lot of space storage. I recommend that you buy a portable US Drive – 5 GB drive or larger. USB Flash drives are available at Patriot Computer, Micro Center, etc.
- Finally, it is extremely important that when you work on GIS Project/Lab assignments, you should consistently back-up your work. Sometimes computer software can crash, and ArcGIS is not exceptional. If you don't save your work, you will be prone to lose your GIS 3-hour work or so!

ArcGIS Software:

This course is completely facilitated Online using Blackboard. You will use your GMU credentials to log in: mymasonportal.gmu.edu/. Additional technical requirements for this course will be:

ArcGIS [ESRI] Software



- *PLEASE READ CAREFULLY*: You will need to be able to use a computer to participate in this course and complete the required work.
- Each student enrolled in this course will receive a student GIS evaluation version [one-year student license] of the ArcGIS 10.6 version [Check for the Evaluation code in the Gradebook – Blackboard]. You must install and use this student GIS software to complete the course. Instructions on how to install the software will be posted through the Blackboard.
- The most dependable student computing lab with ArcGIS installed is **Exploratory Hall, Room 2102**, which you will have swipe/ID access to all term.

- Acrobat Reader, Flash, Java (Windows),
- Windows Media Player, QuickTime and/or Real Media Player.
- Internet Access
- Web browser
- Word Processing software

Students owning Macs or owning computer running Linux should be aware that some courses may use software that only runs on Windows. You can set up a Mac computer with Boot Camp or virtualization software so Windows will also run on it. Watch http://support.apple.com/kb/VI54?viewlocale=en_USabout using Windows on a Mac. Computers running Linux can also be configured with virtualization software or configured to dual boot with Windows.

Note: If you are using an employer--provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types.

Performance-Based Assessments - Grading

You will achieve the course learning outcomes outlined above through reading the textbook, preparing and writing reading summaries (reading reflections), participating in online class discussions, working through GIS tutorials, completing lab exercises, and taking online assessment exams at midterm and during finals week.

Reading Reflections: [15%]

Each student will prepare a bi-weekly 1-page (200 -300 word) reading reflection based on the textbook material from Paul Bolstad (2019) and from associated lectures. You will be asked to summarize the main points of the reading with a focus on concepts, ideas and themes among many other questions including connection of what you are learning in class to the real-world application. Most of the questions throughout the reading reflection assignments will be generic – no need for you to memorize. The questions will give you the opportunity to reflect about the concepts you have learned from the chapter. The Rubric for Grading this assignment will be posted through the blackboard and will be assessed in these categories: **Exemplary** [15 points]; **Accomplished** [10-12 points]; **Developing** [5-8 points]; and **Emerging** [4 points or less]. You will use the Blackboard Journal tool to submit this assignment.

Class Discussions: [10%]

There will online bi-weekly discussion aligned with modules. You will share ideas and questions with your classmates. These may include current events from popular news sources, case studies and extra material from the textbook readings, or subjects chosen by the class. Each student will post an original response to the assigned discussion question initiated by the Instructor and respond to the post of another classmate. You will be assessed on your relevant facts and logical connections between text under discussion and the concepts of the module or question that is initiated by the Instructor. The Rubric for grading this assignment will be posted through the blackboard and will be assessed in these categories: **Expected** [5 points]; **Sufficient** [4 points]; **Insufficient** [3 points]; and **Not Completed** [2 points]. An initial post of 25-100 words, and at least one significant reply to a classmate's post of 25--100 words. Check for detailed instructions through the Blackboard.

GIS Exercises [40%]

There will be 7 separate GIS tutorials and exercises, assigned approximately every two weeks. The GIS tutorials and exercises come from the Maribeth Price, "Mastering ArcGIS" textbook, Paul Bolstad Textbook and Customized Problem-Solving Exercises. Completion of the assigned weekly tutorial and the assigned GIS exercises are required, with submissions taking the form of maps, graphics, tables, statistics, written comments, and answers to the assigned exercises. Specific instructions on these requirements will be provided by the Instructor. All GIS Exercises are due at the time noted in the Course Calendar [Sunday – 11:55 pm]. Late assignments will be accepted with penalty. For details regarding late submission please check due dates and late policy below.

Examinations [35%]:

There will be 2 examinations, which must be completed in the prescribed time period. These examinations will cover the Paul Bolstad textbook, readings as well as the material in the lectures notes. The exams will include multiple choice questions, definitions, Fill-in the Blanks, and short answer questions. *First Exam* will be 15% and the *Second Exam* will be worth 20%.

Policy on missed Exams and Assignments

- All due dates are included in the course calendar. Take note suggested time of 11:55 pm is based on Eastern Standard Time and it is your responsibility to adjust your submittal time accordingly.
- Late assignments will be penalized at 5 points per day. Assignments especially Lab Exercises submitted more than 5 days late automatically will be marked Zero.
- There will be no make-ups on Discussion and Reading Reflections after due date has passed.
- Make-up exams will only be accepted in the event of personal illness or extraordinary circumstances (The Instructor has the right to ask for supporting evidence) or in the case of university-excused absences such as sports, religious holiday etc. If you know in advance that you will not be available during the time when you are supposed to take the exam, please contact me a week prior to the scheduled exam date.

Grading Scale

The following will be your Letter Grade and Percentages to determine your final grade for this course.

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%		

Student Expectations

Academic Integrity

Students must be responsible for their own work, and students and faculty must take on the responsibility of dealing explicitly with violations. The tenet must be a foundation of our university culture. [See http://academicintegrity.gmu.edu/distance].

Honor Code

Students must adhere to the guidelines of the George Mason University Honor Code [See http://academicintegrity.gmu.edu/honorcode]. Discussion of work among students is encouraged. Collaboration and active participation in group discussions is important, but final work should reflect your own thinking, and all submitted assignments must be in your own words and reflect your individual work. I

reserve the right to use GMU-sanctioned tools for detecting and documenting plagiarism. If you have questions about what constitutes plagiarism, please ask me.

MasonLive/Email (GMU Email)

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. [See https://thanatos.gmu.edu/masonlive/login]. I will not respond to any emails sent through private account(s).

Patriot Pass

Once you sign up for your Patriot Pass, your passwords will be synchronized, and you will use your Patriot Pass username and password to log in to the following systems: Blackboard, University Libraries, MasonLive, myMason, Patriot Web, Virtual Computing Lab, and WEMS. [See https://thanatos.gmu.edu/passwordchange/index.jsp].

University Policies

Students must follow the university policies. [See http://universitypolicy.gmu.edu].

Responsible Use of Computing

Students must follow the university policy for Responsible Use of Computing. [See http://universitypolicy.gmu.edu/policies/responsible-use-of-computing]

Diversity Statement

"GMU promotes a living and learning environment for outstanding growth and productivity among its students, faculty, and staff. Mason strives to maintain a quality environment for work, study, and personal growth. An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity includes, but is not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard, and respected". Source: http://ctfe.gmu.edu/professional-development/mason-diversity-statement/

Counseling and Psychological Services

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 [See http://caps.gmu.edu].

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: ds.gmu.edu - SUB I, Room 2500. Telephone: (703) 993-2474.

Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act of 1974 (FERPA), also known as the "Buckley Amendment," is a federal law that gives protection to student educational records and provides students with certain rights. [See http://registrar.gmu.edu/privacy]

Student Services and additional University Services

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

1. University Libraries provides resources for distance students. [See http://library.gmu.edu/distanceandhttp://infoguides.gmu.edu/distance_students].
2. University Career Services [http://careers.gmu.edu/]
3. Writing Center
   The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. [See http://writingcenter.gmu.edu]. You can now sign up for an Online Writing Lab (OWL) session just like you sign up for a face--to--face session in the Writing Center, which means YOU set the date and time of the appointment! Learn more about the Online Writing Lab (OWL).
4. Student Technology Assistance & Resource Center (STAR): Provides all kinds of technology support: JC, Room 229, 703-993-8990, bit.ly/2hWjI0y
5. Student Support & Advocacy Center: Assistance regarding healthy lifestyle and educational choices: SUB I, Suite 3200, 703-993-3686, ssac.gmu.edu

Course Schedule/Calendar

Students are responsible for keeping up with the textbook readings, lectures, GIS tutorials/exercises, project deliverables, and assessments. Readings assigned for the week & session should be completed before the scheduled date. Any changes to this schedule will be announced in class and posted to the course Blackboard page.

	Dates	Topic	Readings [Bolstad]	Reading Reflection	Discussion	GIS Exercises	Exams
Week 0	Jan. 13-19	On-line Class Introduction	None	None	None	None	
Week 1	Jan. 21 -26	Introduction - GIS	Bo: Ch. 1 [Pg. 1-15]		1	-	Pre-test
Week 2	Jan. 27 – Feb 2	GIS History & Concepts	Bo: Ch. 1 Price Ch. 1	1		Tutorial 1	
Week 3	Feb. 3 – 9	GIS Software	Bo: Ch. 1 [Pg. 16-20]		2	Exercise 1	
Week 4	Feb. 10 – 16	GIS Software	Bo: Ch. 1 | Price Ch. 1	2		Tutorial 2	
Week 5	Feb. 17 – 23	Georeferencing	Bo: Ch. 3 [Pg. 87 – 104]		3	Exercise 2	
Week 6	Feb. 24 – Mar. 1	Georeferencing & Map Projections	Bo: Ch. 3 [Pg. 116 -136]	3		Tutorial 3	
Week 7	Mar. 2 – 8	Geographic Data Modeling - Vector	Bo: Ch. 2 [Pg. 39-50]		4	Exercise 3	
Week 8	Mar. 9 – 15	**Spring Break Recess [No Classes]**					
Week 9	Mar. 16 – 22	Geographic Data Modeling - Raster	Bo: Ch. 2 [Pg. 51-57]	4		Tutorial 4	Mid-Term Exam: **3/22**
Week 10	Mar. 23 – 29	Data Representation & Mapping	Bo: Ch. 4 [Pg. 147-156]		5	Exercise 4	
Week 11	Mar. 30 – Apr. 5	Digitizing	Bo: Ch. 4 [Pg. 156 – 168]	5		Tutorial 5	
Week 12	Apr. 6 – 12	Coordinate Transformation	Bo: Ch. 4 [Pg. 168 – 172]		6	Exercise 5	
Week 13	Apr. 13 – 19	GIS & Cartographic Modeling	Bo: Ch. 13 [Pg. 573–583]	6		Tutorial 6	
Week 14	Apr. 20. 26	GIS & Cartographic Modeling	Bo: Ch. 13 [Pg. 583–593]		7	Exercise 6	
Week 15	Apr. 27 – May 3	Basic Spatial Analysis	Bo: Ch. 9 [Pg. 373 – 394]	7		Tutorial 7	
Week 16	May 4 - 10	Basic Spatial Analysis	Bo: Ch. 9 [Pg. 398 – 416]			Exercise 7	Final Exam **5/10**

** NOTE: Any changes to this syllabus will be announced via email and posted on blackboard. For a general university schedule and calendar, see: https://registrar.gmu.edu/calendars/spring-2019/