

GEOGRAPHY & GEOINFORMATION SCIENCE 311

INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS

Summer (C) 2016

Syllabus

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1. INSTRUCTOR & TA

Instructor: Dr. Matt Rice

Term: Summer 2016 (C), June 27^h – July 30th

Faculty Office: GMU Exploratory Hall, Room 2202

Faculty Office Hours: Collaborate (by announcement), skype by appointment

Instructor Email: rice@gmu.edu

TA: Aaron Mulhollen

TA Email: amulholl@masonlive.gmu.edu

Virtual Office Hours: I can be reached via email to arrange office hours via phone or skype (m.t.rice), and I'll be available via Blackboard Collaborate Sessions on a regular basis. I will respond to all student email within 24 hours, and even more quickly between Monday morning and Friday evening.

Students must activate and use their GMU campus email to facilitate contact. Please use a subject line prefix tag: [GGS 311] and send general GIS and troubleshooting questions to the TA first. If the question or concern is administrative, contact me first.

2. 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. Credit Hours for this course: 3

3. COURSE PREREQUISITES

There are no formal prerequisites. Some students may find GGS 110 (Maps and Mapping) useful, but it is not required. GGS 110 may be a required prerequisite course in the future.

4. COURSE EXPECTATIONS

1. Working online requires dedication and organization. Proper preparation is expected every week. You are expected to log in to the course each week and complete the assignments and activities on or before the due dates.
2. Students must check their GMU email messages on a daily basis for course announcements, which may include reminders, revisions, and updates.
3. It is expected that you will familiarize yourself with and adhere to the Honor Code. Student members of the George Mason University community pledge not to cheat, plagiarize, steal, and/or lie in matters related to academic work.
4. It is essential to communicate any questions or problems to me promptly.

5. ONLINE LEARNING COMMUNITY

This online course is taught via Blackboard Courses (Log into <http://mymason.gmu.edu>, select the Courses Tab, and the course can be found in the Course List).

This course is offered completely online. Each week begins on Monday and ends on Sunday. There will be periodic Collaborate sessions where GIS software is demonstrated. **In order to participate, you must be at a computer with a microphone** and optionally, a video camera.

In our online learning community, we must be respectful of one another. Please be aware that innocent remarks can be easily misconstrued. Sarcasm and humor can be easily taken out of context. When communicating, please be positive and diplomatic. I encourage you to learn more about [Netiquette](#).

6. LEARNING OUTCOMES

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

1. Demonstrate a broad knowledge-base of the fundamental scientific theories, principals and techniques of Geographic Information System.
2. Demonstrate an understanding of the societal context of GIS, and articulate important historical events, contemporary developments, and future trends that shape GIS.
3. Apply and demonstrate key concepts of spatial analysis using commercial GIS software.
4. Given a specific problem, identify problem parameters, characterize data needs, assemble data, and perform analysis with GIS.
5. Effectively communicate results of analysis using maps and graphics produced with GIS, created according to best professional cartographic practices and aesthetic guidelines.

7. TECHNOLOGY REQUIREMENTS & EXPECTATIONS

General Hardware:

You will need access to a Windows or Macintosh computer with at least 2 GB of RAM 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: **1.** the storage amount needed to install any additional software and **2.** space to store work that you will do for the course. If you are considering the purchase of a new computer, please go to <http://compstore.gmu.edu/Specials/BTS2012/2012TechGuide.pdf> to see recommendations.

Software:

Many courses use Blackboard as the learning management system. You will need a browser and operating system that are listed compatible or certified with the Blackboard version available on the myMason Portal. See [supported browsers and operating systems](#). Log in to [myMason](#) to access your registered courses. Some courses may use other learning management systems. Check the syllabus or contact the instructor for details. Online courses typically use [Acrobat Reader](#), [Flash](#), [Java](#) (Windows), and [Windows Media Player](#), [QuickTime](#) and/or [Real Media Player](#). Your computer should be capable of running current versions of those applications. Also, make sure your computer is protected from viruses by downloading the latest version of Symantec Endpoint Protection/Anti-Virus software for free at <http://antivirus.gmu.edu>.

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/V154?viewlocale=en_US about 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.

GGG 311: Geographic Information Systems Software

You will need to be able to use a computer to participate in the course and complete the required work. You will not be required to purchase GIS software, but will have a student GIS evaluation version provided for you. **You must install and use this student GIS software to complete the course.** This will require administrator-level access and control of a Windows PC computer that you must use to complete the GIS exercises. If you have convenient,

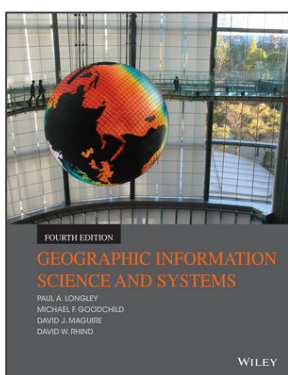
frequent access to a computer with ESRI's ArcGIS 10.3.1 installed and running, you may be able to this computer for the GIS exercises. **Successfully installing the student evaluation version of this software or otherwise gaining access to a computer with ESRI's ArcGIS 10.3.1 is a requirement of this distance education course.**

The course will be taught with Blackboard, accessed through <https://mymasonportal.gmu.edu> . Submission of assignments, participation in discussions, and all assessment testing will be done with Blackboard.

Lectures will be delivered using narrated, pdf slides, created using MS PowerPoint and Adobe Presenter. Each lecture can be viewed by opening the pdf document in Adobe Acrobat. Each lecture will have a transcript with verbatim or near-verbatim text of the lecture for each slide.

8. REQUIRED TEXTBOOKS & MATERIALS

Textbooks must be purchased and available prior to the first day of class (June 27th)



Geographic Information Science and Systems, 4th Edition

[Paul A. Longley](#), [Michael F. Goodchild](#), [David J. Maguire](#), [David W. Rhind](#)

March 2015, ©2016

ISBN: 978-1-119-03130-7

ISBN-13: 978-1118676950

ISBN-10: 1118676955

Wiley Publisher link:

<http://www.wiley.com/WileyCDA/WileyTitle/productCd-EHEP003247.html>

Purchase through Wiley as an e-book:

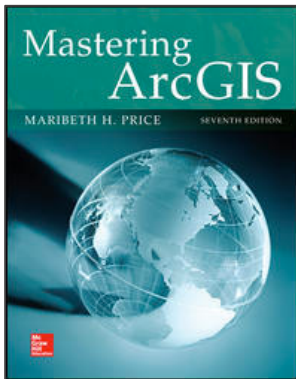
[To be updated soon]

Online Access through CourseSmart:

<https://www.vitalsource.com/products/geographic-information-science-and-systems-paul-a-longley-michael-f-v9781119031307>

Amazon Link:

<http://www.amazon.com/Geographic-Information-Science-Systems-4th-ebook/dp/B00V8QE1E6>



Mastering ArcGIS, 7th Edition

By [Maribeth Price](#)

Copyright: 2016

Publication Date: January 22, 2015

ISBN-13: 978-0078095146

ISBN-10: 007809514X

Other ISBNs exist for this edition of this book. Verify that it is the **7th edition**. No other editions will work with our course content.

McGraw Hill Publisher Link:

<http://shop.mheducation.com/highered/product.M007809514X.html>

Online Access through CourseSmart:

<https://www.vitalsource.com/products/mastering-arcgis-maribeth-price-v9781259598456>

Amazon link:

<http://www.amazon.com/Mastering-ArcGIS-Maribeth-Price/dp/007809514X>

9. PERFORMANCE-BASED ASSESSMENTS

You will achieve these goals through viewing the course lectures, reading the textbook, preparing and writing reading summaries and reading reflections, participating in online class discussions, working through GIS tutorials, completing lab exercises, and taking assessment exams at the end of each weekly module.

a. Reading Reflections: Each student will prepare a weekly 1-page (150-200 word) reading reflection based on the textbook material from Longley et al. (2015) and from the associated lectures. The 5 assigned reading reflections will be graded on both content and form, and collectively will be worth 15% of the final grade. See the Reading Reflection Grading Rubric below. The Reading Reflections will be due on Wednesday of each week.

b. Class Discussions: Each student will participate in an Instructor and TA-led discussion, using the Blackboard discussion tools. The weekly discussions will be based on current events from popular news sources, case studies and extra material from the textbook readings, or subjects chosen by the class. Each student is required to participate during each discussion by making one substantive initial post, at least one reply to a classmate's post. Opinions are not being graded; rather, quality of participation, as noted in the Rubric for Class Discussions. Participation in class discussions is worth 15% of the final grade, and will be assessed on Thursday of each week. See the Class Discussion Rubric below.

c. GIS Exercises: There will be 5 separate GIS tutorials and exercises, assigned every week and due the end of the week on Saturday. The GIS tutorials and exercises come primarily from the Maribeth Price, "Mastering ArcGIS" textbook. 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. Late GIS exercise submissions (those submitted after the deadline) will be penalized 10% for each day they are late, and will not be graded after the 10th day. The 6 assigned GIS Exercises are cumulatively worth 40% of the final grade.

d. Examinations: There will be 5 weekly examinations, which must be completed in the prescribed time period. These examinations will cover the Longley et al. textbook readings as well as the material in the video lectures. The exams will include multiple choice questions, definitions, and short answer questions. The six exams will be worth 5% each and cumulatively worth 30% of the final grade.

10. GRADING SUMMARY

Students will be evaluated in the following areas, with the following grade weighting:

Reading Reflections (15%)

Class Discussions (15%)

GIS Exercises (40%)

Examinations (30%)

Grades are assigned using a standard ten point scale:

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 – 59.9

11. RUBRICS

Class Discussions

Online Discussion Protocols and Discussion Rubrics. Dabbagh, N. Copyright 2000 - 2003. Adapted with permission of author. *Modified by Katrina Joseph (2012) and Matt Rice on 11/26/2013.*

(1) Instructions:

Participation will consist of the following two elements:

- a) An initial post
- b) At least one reply to a classmate's post

Discussions will open on Blackboard on Monday at 6 a.m. EST. Submit your initial post no later than Wednesday before midnight EST. Read your classmates' posts and reply to one of them between Wednesday and Thursday before midnight EST.

(2) Discussion protocols:

1) Discussion postings should be evenly distributed during the discussion period (not concentrated all on one day or at the beginning and/or end of the period).
2) Discussion postings should be a minimum of one 25 words and a maximum of 50 words. I encourage you to: <ul style="list-style-type: none"> • Address the questions or topic as much as possible (don't let the discussion stray). • Use quotes that support your postings and include citations and references that support your discussion. The citations and references do not count toward your 25-50 word length. • Build on others' responses to create threads.
3) Avoid discussion postings that are limited to 'I agree' or 'great idea', etc. If you agree (or disagree) with a posting then say why you agree by supporting your statement with concepts from the readings or by bringing in a related example or experience.
4) Include related prior knowledge (e.g., work experience, prior coursework, readings)
5) Use proper netiquette (i.e., the culture of communicating digitally). Learn more about Netiquette through this link: Netiquette

(4) Grading rubric for evaluating discussions

Discussion Rubric				
Criteria	Expected	Sufficient	Insufficient	Not Evident or Not Completed
Timely discussion contributions (initial post and reply post)	2 postings well distributed throughout the discussion period	2 postings distributed throughout the discussion period	1 posting somewhat distributed throughout the discussion period	0-1 postings not distributed throughout the discussion period

Responsiveness to discussions and demonstration of knowledge from readings	very clear that readings were understood and incorporated well into responses	readings were understood and incorporated into responses	postings have questionable relationship to reading material	not evident that readings were understood and/or not incorporated into the discussion
Adherence to discussion protocols (see above)	all 5 protocols adhered to	3-4 protocols adhered to	1-2 protocols adhered to	0 protocols adhered to
Points	10	7-9	5-6	5 or less

Reading Reflections

(1) Instructions:

Each student will prepare a Reading Reflection using the **Blackboard Journal** tool. The reading reflections will be assigned weekly. The reading reflection will be evaluated and assessed by the Instructor and Teaching Assistant using the same Blackboard Journal tool. Reading Reflections should not only be a summary of the material in the weekly readings and lectures, but should also be a concise synthesis of the material, including quotes, references, and relevant personal experiences or anecdotes. A Reading Reflection will consist of a 150-200 word summary and synthesis of the weekly lectures and Longley et al. textbook readings.

(2) Reading Reflection Rubric

Adapted from <http://ctfe.gmu.edu/teaching/grading/sample-rubric-for-grading-a-research-paper/>

Reading Reflection Rubric				
Criteria	Outstanding	Good	Fair	Poor
Organization	Reading Reflection includes a short introduction, a body, and a short synopsis, and is well organized	The Reading Reflection is missing an introduction or synopsis and has minor organizational errors	The Reading Reflection is missing an introduction and a synopsis and is poorly organized	The reading reflection lacks coherent organization and structure and is missing an identifiable introduction, body, and synopsis
Length	150-200 words	Minor length deviation (<20%)	Major length deviation (20%-40%)	Length does not adhere or approach length requirements (> 40% deviation)
Syntax	Correct grammar and syntax	Minor syntax, grammar, and spelling errors	Multiple syntax, grammar, and spelling errors throughout Reading Reflection	Reading Reflection is replete with syntax, grammar, and spelling errors
Research and Content	The Reading Reflection contains relevant material from the lecture and reading material, and extends the material through a well-presented synthesis	The Reading Reflection contains material from the lecture and reading, with minor deficiencies, omissions, or irrelevant content	The Reading Reflection only partially relates to the reading and lecture material and contains much irrelevant content	The Reading Reflection does not relate to the lecture or readings at all
Points	10	7-9	5-6	5 or less

GIS Exercises

Each GIS Exercise will be graded out of 20 points, with 1 point for each answer indicated in the assigned problem set. A complete answer with the relevant units will be worth full credit for that problem. Students start with 20 points and receive a 1 point deduction for incorrect answers, and a ½ point deduction for minor errors such as a lack of units where required. Incorrect or incomplete answers not including an omission of units (ft., yards, acres, miles, meters, etc.) will receive a full point deduction. GIS Exercises will have a full written evaluation and specific indicators of reasons for point deductions. GIS Exercises should be submitted through Blackboard in Microsoft Word format, using the relevant assignment link for the chapter due. GIS Exercises will be due on Saturday night at midnight of the week they are due.

12. COURSE SCHEDULE

You are responsible for keeping up with the textbook readings, lectures, reading reflections, discussions, GIS tutorials/exercises, and assessments. No makeup exams will be available. Readings assigned for the week & session should be completed before the scheduled date. **Any changes to this schedule will be announced via email and posted to the course Blackboard page.**

	<u>Dates</u>	<u>Readings (Longley)</u>	<u>Pages</u>	<u>Video Lecture Topic</u>	<u>Reading Reflection</u>	<u>Discussion</u>	<u>GIS Exercises (Price)</u>	<u>Examinations</u>
		Due: Monday		Due: Tuesday	Due: Wednesday	Due: Thursday	Due: Saturday	Due: Sunday
Week 0	< Jun. 27			Orientation, Review Syllabus				Pretest
Week 1	Jun. 27 – Jul. 3	1.1-1.7	pp.3-32	GIS History & Concepts	1	1	Price 1	Assessment 1
Week 2	Jul. 4 – Jul. 10	6.1-6.7	pp.128-151	GIS Software	2	2	Price 2	Assessment 2
Week 3	Jul. 11 – Jul. 17	4.1-4.13	pp.77-98	Georeferencing	3	3	Price 3	Assessment 3
Week 4	Jul. 18 – Jul. 24	3.1-3.9	pp.55-76	Representing Geography	4	4	Price 4	Assessment 4
Week 5	Jul. 25- Jul. 30	8.1-8.7	pp.173-183	GIS Data Collection	5	5	Price 5	Assessment 5
Additional video lectures associated with Longley et al. Chapters 11, 12, and 5 may be provided for interested students, but will not be graded or included in the course. The subjects of these lectures are Cartography (11), Geovisualization (12), and Uncertainty/Accuracy (5).								

13. 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>].

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>].

14. DIVERSITY

<http://ctfe.gmu.edu/professional-development/mason-diversity-statement/>

“George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, 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 is broadly defined to include such characteristics as, but 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.”

15. RELIGIOUS HOLIDAYS

http://ulife.gmu.edu/religious_calendar.php

I am generally aware of some religious holidays and observations, and will help minimize difficulties for students of different faiths in terms of scheduling course assignments. It is the student's responsibility to speak to me in advance should their religious observances impact their participation in class activities and assignments.

16. SPECIAL NEEDS

If you have a documented learning disability or other condition that may affect academic performance you should: **1)** make sure this documentation is on file with the Office of Disability Services (SUB I, Rm. 2500; 993-2474; <http://ods.gmu.edu/>) so that they can make a determination about the accommodations you need; and **2)** communicate with me to discuss your accommodation needs or have the Office of Disability Services do so. I can provide proper accommodations with documentation and professional advice from the Office of Disability Services.

17. STUDENT SERVICES AND UNIVERSITY RESOURCES

University Libraries

University Libraries provides resources for distance students. [See <http://library.gmu.edu/distance> and http://infoguides.gmu.edu/distance_students].

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 \(OWL\)](#).

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>].

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>].