

# Geography and Geoinformation Science 311-002 Introduction to Geographic Information Systems

Spring 2017

Credits: 3

Tuesdays & Thursdays 3:00 PM – 4:15 PM, Exploratory Hall 2103

## INSTRUCTOR INFORMATION

Dr. Sven Fuhrmann

Associate Professor

Exploratory Hall 2204

Phone: 703-993-2289

Email: sfuhrman@gmu.edu

Office Hours: Tuesdays 2:00PM-3:00PM, Wednesdays 12:30PM-1:30PM and by appointment.

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## CLASSMATE CONTACT INFORMATION

Name	E-mail	Phone

## CATALOG DESCRIPTION

Fundamental concepts and theories for appropriate use of geographic information systems (GIS). Discusses basic GIS functionality and applications in various fields.

## COURSE OBJECTIVES AND OUTCOMES

This class is identified as a Students as Scholars Scholarly Inquiry course. In this mid-level scholarly inquiry course, you will learn about the process of scholarly inquiry as preparation for your participation in an original research project, i.e. GGS 463 (Applied Geographic Information Systems). You will learn how to articulate a scholarly question; engage in the key elements of the scholarly process; and situate the concepts, practices, or results of scholarship within a broader context. A final presentation of your work will summarize your findings.

This course will prepare students to conduct original, scholarly research. In GGS 311, students will:

- Articulate and refine a research question,
- Follow ethical principles in research,
- Choose the appropriate process, approach, or methodology for scholarly inquiry, and
- Situate the scholarly inquiry within a broader context.

The content of this course focuses on the following topics: history of GIS, modern spatial data processing, development, implementation, and functions of geographic information systems

(GIS); relations between GIS and other geotechnologies; and applications of geographic information systems to a variety of human and environmental applications. By the end of this course you should be, in addition to the above outlined inquiry course outcomes, able to:

- Define key concepts related to geographic data, geographic information systems and software, georeferencing, basic map production and display, structure queries of spatial data, and spatial data representation.
- Demonstrate basic elements of these key concepts using GIS software applications.
- Use the foundation you acquire in this course to prepare you for the upper-level and research and scholarship courses (RS) at Mason, for internships, and for basic work-related GIS projects.

To learn more about Students as Scholars, visit [oscar.gmu.edu](http://oscar.gmu.edu).

## **MATERIALS**

### **Required Text**

Lab Manual: Price, Maribeth. (2016). Mastering ArcGIS, 7<sup>th</sup> Edition, Boston: McGraw Hill. ISBN-13 9780078095146

### **Recommended References**

Bolstad, P. V. (2016). GIS Fundamentals: A First Text on Geographic Information Systems, Fifth Edition, XanEdu. ISBN 978-1-50669-587-7. (eBook available: 978-1-50669-588-4)  
[http://www.xanedu.com/higher-education/educators/custom-books-catalog/gis\\_fund\\_5e/](http://www.xanedu.com/higher-education/educators/custom-books-catalog/gis_fund_5e/)

Additional recommended reading material will be made available on Blackboard or handed out during lecture. Some sources are listed below; others may be added during the semester.

Arc News (ESRI). Subscribe for free newsletter at <http://www.esri.com/esri-news/arcnews>

### **Other Materials**

Students will also require a 16GB USB Drive (or larger) for storage of their lab project materials.

### **George Mason Online account**

It is essential that you activate your George Mason computer account, since we will be using Blackboard for communication and assignment purposes.

## **CLASS POLICIES**

### **General Class Policies**

This class will consist primarily of:

- Weekly reading and homework assignments
- Self-initiated study and knowledge development
- Written assignments: Written communication is an essential skill. All written assignments are expected to be completed with no grammatical or spelling errors. The assignments should be professionally acceptable.
- Project assignments

- Exams

### **Knowledge and Effort**

This course requires significant computer file management skills and the ability to work within a Windows computer environment without assistance. You are **expected to spend considerable time developing thoughtful products**, conducting limited research to feed into your written assignments, as well as participate with others in the class and lab. Students must demonstrate a mature, professional, and conscientious effort toward class work and participation.

### **Attendance**

Students are expected to attend class. This course introduces considerable material and requires many hours of work. Please do not fall behind your reading or assignments. Poor attendance will result in a poor final grade.

Additionally, students are expected to arrive on time. Because of the size of this class, students entering the classroom late disturb the class activities. **Be present and be punctual.**

### **Late Work (Lab Assignments)**

Late work will only be graded if it is submitted within 5 working days of the due date. Please note that late assignments will be subject to a 10% reduction in the final assignment grade.

If Blackboard is not working the day that assignments or labs are due, the due date is extended until Blackboard becomes available. To be certain, please contact your instructor or teaching assistant for further guidance.

### **Cell Phones**

All cell phones need to be turned off during class and during examination periods (i.e., midterm, final exam).

### **Video and/or Audio Recording**

Video and/or audio recording and distribution of lecture content is not permitted and require consent of the lecturer.

## **UNIVERSITY POLICIES**

### **University ADA Statement and Policy**

Students with special needs (as documented by the Office of Disability Services) that will require compensatory arrangements must contact the instructor no later than the fourth class period to discuss specific arrangements and logistics. Students who have not already done so will be required to contact the Office of Student Disability Services located at SUB I, Room 2500 (703.993.2474). George Mason University is dedicated to providing these students with necessary academic adjustments and auxiliary aids to facilitate their participation and performance in the classroom. The full ADA-compliant policy is available online at: <http://ods.gmu.edu/>

### **Academic Testing for Students with Disabilities**

Students who are approved for testing accommodations have the option of using the Office of Disability Services exam lab to take in-class tests or quizzes with their accommodations. Any student who schedules a test with ODS must schedule tests during the in-class scheduled test

time (or seek an exception from the instructor) and are expected to take the test at ODS. If a student schedules to take a test with ODS but decides that they will take the test in the classroom, the student will be responsible for notifying ODS and the instructor prior to the class start time.

**Academic Integrity**

Learning and teaching take place best in an atmosphere of intellectual fair-minded openness. All members of the academic community are responsible for supporting freedom and openness through rigorous personal standards of honesty and fairness. Plagiarism and other forms of academic dishonesty undermine the very purpose of the university and diminish the value of an education. Specific sanctions for academic dishonesty are outlined in George Mason Student Handbook. More information: <http://oai.gmu.edu>

**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 (including messages related to this class) will be sent to students solely through their Mason email account. See <http://masonlive.gmu.edu> for more information.

**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**

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

**GRADING AND EXAMS (INCL. BRIEF DESCRIPTION OF MAJOR COURSE REQUIREMENTS)**

Grades will be based on the following table:

Activity	Percent	A+ 100%
Final Project (A final project presentation file that needs to be submitted via Blackboard by the given deadline)	20	A 93-99%
Lab Grade (The lab grade represents the submitted lab assignments)	40	A- 90-92%
		B+ 87-89%

Midterm (A written exam – date see below)	20	B	83-86%
Final (A written exam – date see below)	20	B-	80-82%
		C+	77-79%
		C	73-76%
		C-	70-72%
		D	60-69%
		F	<60%

*NOTE: Your final percentage will round to the nearest whole number, e.g., 89.2=89 but 89.6=90.*

### **Mid-Term Exam**

**Tuesday, March 7, 2017 (during normal class time)**

### **Final Exam**

**Thursday, May 11, 2017, 1:30PM – 4:15PM**

### **Exams policies**

Exams are one form of student assessment. This course utilizes multiple methods for assessing student progress and performance to include exams, projects, and written assignments. There will be no make-ups or early assessments, with the exception of extreme personal hardship, which must be discussed with the instructor prior to the assessment date and agreed upon. In these limited, documented cases, the following policies apply: 1) the make-up exam is different from the original exam but no more difficult, and 2) the format of the exam may be changed.

### **Important Dates**

Jan 23: First day of classes

Jan 30: Last day to add/drop classes

Feb 24: Final Drop Deadline

Feb 27 –Mar 31: Selective Withdrawal Period

Mar 7: Midterm

Mar 13 – Mar 19: Spring Break

Mar 30 – Project Proposal Due

Apr 13 – Data Check (Final Project)

May 4 – Final Projects are due

May 6: Last day of classes

May 11: Final

## TENTATIVE COURSE OUTLINE – GENERAL DESCRIPTION OF SUBJECT MATTER

*NOTE: This outline is subject to modification. Students will be notified of any changes. Students are encouraged to download the lecture slides from Blackboard.*

Date	Topic	Exercises / Lab Assignments
1/24	Syllabus & Course Policies	
1/26	Introduction to GIS I	Installing ArcGIS Student Evaluation Software
1/31	Introduction to GIS II / History of GIS	
2/2	Spatial Data	Price: Chapter 1 Data downloading lab
2/7	Modeling our Earth	
2/9	Projections I	Price: Chapter 2
2/14	Projections II	
2/16	Coordinate Systems I	Price: Chapter 3
2/21	Coordinate Systems II	
2/23	Geodatabases	Price: Chapter 4
2/28	Topology / Data Errors	
3/2	Data Processing I	Price: Chapter 5
3/7	Midterm	
3/9	Data Processing II	Price: Chapter 6
3/14	Spring Break (no class)	
3/16	Spring Break (no class)	
3/21	Data Analysis with Vector Data I / The final project	
3/23	Data Analysis with Vector Data II	Price: Chapter 7;
3/28	Data Analysis with Vector Data III	
3/30	Data Analysis with Vector Data IV	Price: Chapter 8 Final Project Proposal Due
4/4	Data Collection I	Price: Chapter 9
4/6	AAG conference (no lecture, please work in lab)	Price: Chapter 9
4/11	Data Collection II	
4/13	Map Design I	Price: Chapter 10 / Final Project Data Check
4/18	Map Design II	
4/20	Raster Analysis I	Work on Final Project
4/25	Raster Analysis II	Work on Final Project
4/27	Work on Final Project	Work on Final Project
5/2	Final Project Status	Work on Final Project
5/4	Review (Final)	Final Project is Due
5/11	Final Exam	