

Geology 213-GIS in Geology

Instructor: Amelia Deuell Rothleutner

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Meeting times: MW 12:00-1:20pm

Office Hours: Monday 2-3pm, Tuesday 2-3pm in ES 230 (computer lab) or by appointment or ambush

Office: ES 114

Course Description: GIS in Geology is an introduction to Geographic Information Systems (GIS). This class emphasizes data sources and ArcGIS software tools for data input, display, manipulation, analysis, output and map making. The course is also designed to provide Geology majors with the ArcGIS skills necessary to succeed in advanced Geology courses that include GIS-based projects.

ArcGIS, problem solving and data management are best learned by just doing it. This is a lab-based course designed to provide as much hands-on experience as possible accompanied by lectures to introduce and provide necessary background. Lastly, ArcGIS has a steep learning curve and can be very frustrating. Please be patient and come to class with a good attitude.

Course Objectives: Upon completion of this course you will be able to:

- Apply ArcGIS and troubleshooting techniques.
- Use a spatial approach to solving geologic problems.
- Construct a proper map with standard map elements.
- Manage data in an organized, efficient manner.
- Acquire relevant geologic spatial data from network archives.
- Operate MS Windows, navigate network drives, and use MS Word, Excel, and PowerPoint.

Geology 213 (GIS in Geology) provides information for the following degree/program outcomes:

	B.A. Geology	B.S. Geology	B.S. Geophysics	GUR
Outcomes	5. <i>Earth scientists use repeatable observations and testable ideas to understand and explain our planet.</i> 6. <i>Geology</i>	5. <i>Earth scientists use repeatable observations and testable ideas to understand and explain our planet.</i> 6. <i>Geology</i>	5. <i>Earth scientists use repeatable observations and testable ideas to understand and explain our planet.</i> 6. <i>Geology</i>	1. <i>Analyze and communicate ideas effectively in oral, written, and visual forms.</i> 3. <i>Use quantitative and scientific reasoning to</i>

	<p><i>and society are fundamentally inter-related.</i></p> <p><i>7. Have developed their observational, analytical and quantitative skills.</i></p>	<p><i>and society are fundamentally inter-related.</i></p> <p><i>7. Have developed their observational, analytical and quantitative skills</i></p> <p><i>8. Can create maps and understand what they tell us about the Earth.</i></p> <p><i>10. Will be able (alone or in teams) to present geological information clearly.</i></p>	<p><i>and society are fundamentally inter-related.</i></p> <p><i>7. Have developed their observational, analytical and quantitative skills</i></p> <p><i>8. Can create maps and understand what they tell us about the Earth.</i></p> <p><i>10. Will be able (alone or in teams) to present geological information clearly.</i></p>	<p><i>frame and solve problems.</i></p>
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Canvas: Canvas will be used as the primary method for reading assignments and communication. I will use Canvas to post assignment information, announcements, readings, .pdf versions of my PowerPoint lectures, and other miscellaneous items.

GIS Data and Network Drives: This class involves a lot of moving files between your local computer, a thumbdrive, Canvas, and the geologist network drive. Once you have downloaded the data files from Canvas, you will extract them to your C:\Temp directory. Once your work is completed for that session, you may save any work you've done on in your "working" folder in the directory. Alternatively, you can use an external hard drive. NOTE: Your U:\ drive won't have enough space, so don't use it. All work done in these computer labs must be done in the C:\temp directory, and this may be purged every night. So you need to find some other place to save and store your data.

Required Texts: There will be reading assignments from various sources, and required reading material will be provided on the class directory. We will not have a required text book. There is an extensive set of tutorial exercises at the ESRI web site, in their "Virtual Campus". It is a good idea to set up an account at ESRI in case you have additional questions about how a GIS is set up or how the ArcGIS software works. It is free, as are the online tutorials. <http://training.esri.com/gateway/index.cfm>

You are required to bring a notebook to class to write down any lecture notes as well as notes on the projects on which you are working.

Course Structure: Meetings will be in the computer lab (ES 230). Short lectures will focus on theory and concepts associated with ArcGIS. Labs will comprise the majority of the course time and will consist of a sequence of projects designed to give you practice using ArcGIS while solving geologic problems.

To succeed in this class, you will be required to be competent with PCs, network drive navigation, Windows and Microsoft Word, Excel, and Power Point (if you aren't familiar with these, you can get tutorial assistance at the Student Tech Center; 650-4300).

Assessment: There will be 7 weekly tutorial-based lab exercises that will draw from class readings, the ESRI Virtual Campus exercises, and in-class lectures and examples. Content of the exercises is cumulative, so you cannot afford to miss a lab. Late lab exercises will be marked down 10% per day. Let me know if you are falling behind—I can help.

You will complete four in-class 45 to 60 minute quizzes during the quarter. The quizzes will test your comprehension of the assigned readings and the ArcGIS tools and analysis techniques developed in the projects. You will be provided data sets and a set of questions and perform similar operations established in the projects. I don't allow notes or other resources during the quizzes.

During the last two weeks of the quarter you will complete an assigned final project that is designed to make use of most of the tools and techniques introduced in the projects. At the end of the quarter, you will turn in a complete final project document with 2-3 pages of text and multiple process maps including a final map, and a lab book that documents your steps, trials, and thinking.

<u>Activity</u>	<u>Percent of Total</u>
Lab Assignments	40%
Quizzes	30%
Final Project	20%
Final Exam	<u>10%</u>
TOTAL	100%

Final letter grades are based on a percentage of points earned, where:

100-93 = A, 92-90 = A-, 89-88 = B+, 87-83 = B, 82-80 = B-, 79-78 = C+, 77-73 = C, 72-70 = C-,
69-68 = D+, 67-63 = D, 62-60 = D-, 60 or below = F.

Academic Success and Support Services: Please feel free to talk to me anytime about your performance in the course or possible ways you can improve. If methods and techniques in class aren't working for you, you could try the ESRI suite of online tutorials at: <http://training.esri.com/gateway/index.cfm>

If you need disability-related accommodations, please notify Student Support Services at 650-3083 (phone) or 650-3725 (TTY) or <http://www.wvu.edu/depts/drs/>

Academic honesty is an important part of every course at WWU. You will find that cheating on digital projects is rather easy. However, turning in someone else's work will only ensure that you gain nothing from this class and that you have more difficulty later on in this or future classes. Cheating will also result in severe penalties. Please make sure you read the Academic Honesty Policy and Procedure in Appendix D of the WWU Course Catalog for details <http://catalog.wvu.edu/content.php?catoid=6&navoid=598>

Attendance, Tardiness, Leaving Early, and Cell Phones: I will not be taking attendance, but there will be important information presented in the lecture portions of this class and it is in your best interests if you attend all class meetings. Also, remember that there will be quizzes over recently learned material. Later in the quarter you will be spending more time independently working on assignments and projects. You should know that the GCC (Geology Computation Center, ES 230) is very busy during the school week, and class time is a great time to spend getting your projects completed. If you are found using class time to check facebook, etc., you will be asked to leave the class to free up the computer for students who are working on academic projects (even if there are other seats available).

Late arrivals and early departures disrupt everyone so please be considerate of your fellow students. If you arrive/leave during class, take the first available seat you can find.

Tentative Schedule: All Labs are on the due date by 12:00 pm.

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Week	Topics	Important due dates
Week 1 9/19-9/23	Introduction and Data Management	

Week 2 9/26-9/30	MXDs, Vectors and Rasters	Lab 1 due 9/28 -
Week 3 10/3-10/7	Scales	Lab 2 due 10/5
Week 4 10/10-10/14	Projections	Lab 3 due 10/12 Quiz 1: 10/12
Week 5 10/17-10/21	Queries	Lab 4 due 10/24
Week 6 10/24-10/28	Geoprocessing	Lab 5 due 10/31 Quiz 2: 10/31
Week 7 10/31-11/4	GIS Data Archives	
Week 8 11/7-11/11	ESRI Training/Buffers	Lab 6 due 11/9
Week 9 11/14-11/18	Final Project Introduction	Lab 7 due 11/16 Quiz 3: 11/16
Week 10 11/21-11/25	Final Project Thanksgiving Break: No class 10/23	Rough draft of written summary and Lab book due 11/21 Preliminary DFD due 11/21
Week 11 11/28-12/2		Optional Lab 8 due 11/30 Final Quiz 11/30 Final Project due 12/5

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I reserve the right to alter the syllabus and schedule throughout the quarter.