

WILD/GEOG 1800

Introduction to Geographic Information Science

Spring Semester, 2020

Lecture: MW 8:30am-9:20am (NR105)

Labs: T 2:00pm-4:00pm; WF 1:30pm-3:20pm (LSB225A)

Instructors:

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COURSE DESCRIPTION

Geographic Information Systems (or GIS) refers to the technology used to capture, manage, analyze, and display geographically referenced information. Geographically referenced information is simply information about where something is and what is there. GIS technology is increasingly used in a wide range of fields. Some examples include environmental modeling, facilities management, social and demographic change analyses, urban planning, homeland security, economic development, site suitability analyses, marketing, transport routing, and web design.

Geographic Information Science (or GIScience) is the science behind the technology. GIScience studies the underlying theory and building blocks of GIS. GIScientists work to improve knowledge about GIS, its applications, and to address fundamental questions that GIS raises for society.

This course will introduce the fundamental concepts of geographic information systems and science, including geographic data, mapping, geospatial analysis, and geospatial technologies. The course involves both lectures and hands-on lab activities using ESRI ArcGIS, the most widely used commercial GIS software package.

While students will gain a working knowledge of ArcGIS, the focus of the course is on analytical concepts that are fundamental in any GIS environment. After the successful completion of the course, students should:

1. Understand basic concepts and terminology of geographic data, spatial analysis, geospatial technologies, and cartography
2. Develop skills in the operation of GIS software
3. Be able to formulate a research question and implement analytical steps to answer the question using GIS
4. Know how to find and use resources, including sources of geospatial data, to answer questions and solve problems

PREREQUISITES AND EXPECTATIONS

There are no prerequisites for this course, but you should be familiar with the Windows operating system and be able to perform basic tasks such as copying files and folders, editing documents, navigating websites, and using search engines and online mapping tools (such as Google Maps).

As with any university-level course, an understanding of basic mathematics and statistics is required. You will be expected to write professionally with proper spelling and grammar. All secondary sources must be properly cited and referenced.

COURSE MATERIALS:

USB DRIVE OR EXTERNAL DISK:

A USB drive or external hard disk is required. The lab computers do not save your personal profile or assignments. Once you log out, your profile and data are deleted from the server. ***It is important that you keep all of your work on a USB dongle or external hard disk.*** Alternatives to an external drive include cloud-based options such as Box or Drop Box, etc. It is **critical** that you back up your data often. Nothing is more painful (*or educational*) than having all of your data eaten by the digital dog right before you turn it in. It will happen!

CANVAS:

We will use Canvas (<http://canvas.usu.edu/>) for announcements, submitting assignments, online discussions, and grade reporting. It is your responsibility to use the Canvas system. Questions about Canvas can be directed to the USU IT service desk (it.usu.edu, [servicedesk@usu.edu](mailto: servicedesk@usu.edu), 435-797-4357).

EMAIL:

The best way to contact Doug or Shannon is via e-mail. We will try to respond to e-mails on the same day and within no more than two working days (*we hope*). Shannon is very good at monitoring her Canvas email. Doug, not so much. Please use my actual email address (doug.ramsey@usu.edu) whenever possible.

SOFTWARE

We will use the latest version of ArcGIS, which is available on all computers in the LSB lab as well as on the third floor of the Quinney Library. Student licenses are also available to install on personal computers through the USU site license web site. Contact Shannon Belmont for an authorization code.

COURSE STRUCTURE:

The class is a standard Lecture/Lab class with lectures twice a week (MW) starting on the fourth week and one lab (3 sections). Friday lectures beginning on the fourth week will be used to assist students to complete assignments and to answer questions. Doug will be available in his office during this time. The lectures will focus on theory, application, and case studies. Participation during lectures is essential to your learning in this course. Learning is about asking questions..... SO ASK!!!

READINGS

Readings will be assigned for most lectures. It is your responsibility to complete the readings listed on the course schedule before coming to class.

QUIZZES

There will be four quizzes (~1 per month) delivered through Canvas. Quizzes may cover material from previous lectures, labs, and reading assignments *and may also cover materials yet to be presented in class*. Quizzes will be open-book, notes, web, etc., but you are expected to do your own work. Do not provide answers to your classmates - *Let them suffer*.

EXAMS

There will be two exams: Both exams will be delivered through Canvas. A mid-term exam will be available between Monday, Feb. 27th and Wednesday, March 3rd. The Final Exam will be available through Canvas during the finals week starting on May 1st, at 7:30am and will terminate on May 5th at 9:20am (the end of our scheduled final exam time). Exams will cover material from lectures, readings, and labs. The same book, notes, web usage rules used for the quizzes apply to the exams. The final will **not** be comprehensive.

GRADING SCALE

| Grade | A | A- | B+ | B | B- | C+ | C | C- | D | F |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| % | 93-100 | 90-92 | 87-89 | 83-86 | 80-82 | 77-79 | 73-76 | 70-72 | 60-69 | < 60 |

RUBRIC

Students will be responsible for the following work:

| | Percent of grade |
|----------------------------|------------------|
| Lab assignments (12 total) | 50% |
| Participation | 10% |
| Quizzes | 15% |
| Mid-term exam | 12.5% |
| Final exam | 12.5% |
| Total: | 100% |

LABS

The lab is intended to provide hands-on experience working with GIS software.

Shannon is responsible for the labs. She has organized an excellent set of exercises and a few introductory videos. Doug will assist and help with questions during lab times. Labs will start with a brief introduction, including an overview of the learning objectives, materials, and expected deliverables.

Students will have the remainder of the lab to work individually or in groups. For most labs, students will be required to work outside of lab period to complete the assignment. **If you are working in a group, and we encourage you to do so, please do not turn in a copy of your partners work (or visa versa). Make your work personal to you. It's hard to figure out if you are working with someone or just copying their work (that's bad, BTW).**

LAB ATTENDANCE

The lab portion of this course is critical. However, lab attendance is **not** mandatory. If you feel that you can complete lab assignments without coming to lab, then that's fine. You are, however, encouraged to attend lab. You may attend a different lab section on occasion when your schedule for any given week keeps you from attending your designated lab time or if you need some extra help completing an assignment. Be aware, however, that our **labs are full** and continually attending a different lab from the one that you registered for will make the labs crowded. Also, if you want to install the software onto your laptop, then you should bring your

laptop to lab so that you can work more efficiently. This will also reduce the competition for the lab workstations.

LAB ASSIGNMENTS

There are 12 lab assignments. Lab assignments have been written with the intent of exposing you to the fundamental tools of ArcGIS, teaching you to think and solve problems spatially, and to be resourceful when troubleshooting problems.

Assignment types will vary depending on the week and subject matter being covered; however, assignments will generally require some independent research and additional time in the lab.

Lab assignments and deliverables are to be written **in your own words**.

Lab assignments will be available through Canvas. Due dates depend on your individual lab section. As a general rule, each assignment will be due the following week before the start of lab. The lab schedule is aggressive and unrelenting (*Shannon is the hard-nose here, so don't blame Doug*). Lab exercises will not always be finished within the lab period. Late assignments will be penalized according to the late work policy for the course (below). However, it is better to turn labs in late rather than not turn them in at all. If you are having issues meeting deadlines, **please** talk to us.

Each lab exercise builds on knowledge and skills acquired in previous assignments. Assignments get progressively more complex and instructions become less detailed throughout the semester. You cannot afford to get behind.

Students will generally submit lab exercises in digital form through Canvas (unless specified). Individual feedback will be provided through Canvas; student submissions will be marked up and individual comments provided on the grading rubric associated with each exercise. The feedback provided is designed in part to help the student improve their cartography and presentation style, which is a critical component of effectively presenting GIS results.

Lab assignments will be graded not only on providing the “correct” answers (*those are important*), but also on your ability to clearly and professionally express information through text and graphics.

LAB GRADING

Grading rubrics for each lab can be found under the individual assignment page on Canvas. Specific grading criteria are listed with the associated points each criterion is worth. If you merely do what is asked of you on each assignment, you will meet expectations and can expect to get a B. To get an A, your submissions will need to be exceptional. More information and details about grading will be available in lab.

LAB HARDWARE AND SOFTWARE

A personal computer is not required for this course. Aside from the LSB lab, the Quinney computer labs are available for student use (hours available at: http://qcnr.usu.edu/quinney/computerlab_hours). Computers with ArcGIS are also available for USU students at the open-access computer lab in the College of Engineering (<http://bit.ly/1Z1QJDj>).

ArcGIS is available through the campus site license web site for students wishing to use their own computer; system requirements can be found at: <http://arcg.is/1wRy0RD>. Note that ArcGIS is only compatible with the Windows operating system. If you have a Mac, you will need to install Boot Camp or a virtual Windows machine such as Parallels or VMware. Contact Shannon

Belmont for an authorization code to download of the ArcDesktop software.

CLASS POLICIES

ATTENDANCE AND PARTICIPATION:

Attending each lecture and lab session is necessary to achieve a satisfactory grade in this course. If you miss class, do not e-mail the instructors to ask what you missed. It is your responsibility to obtain materials or notes from other students and Canvas.

LATE WORK AND MAKE-UP EXAMS

It is your responsibility to turn in all work on time. Grades for assignments will be reduced by 10 percent for each day late. No late work will be accepted more than 2 weeks after the due date. No make-up exams or quizzes will be offered unless prearranged with the instructor or as a result of a documented emergency.

USE OF COMPUTERS, TABLETS, AND MOBILE PHONES

Turn off or silence phones during class. Computers and tablets may be used only for taking notes or activities directly relevant to lecture material during class (*i.e. no Facebook, Twitter, Netflix, etc.*). Students should respect the rights of others to learn and minimize the possibility of distraction from the use of electronic devices. If the use of electronics presents a distraction to others during class, the student will be asked to stop using the device. If issues persist, the student will be asked to leave the class.

ACADEMIC HONESTY

Students are expected to produce original work. Plagiarism or falsification of any kind will be subject to disciplinary action. Offences will be referred to Utah State University Admissions office. The USU policy for academic honesty can be found at: <http://bit.ly/22Hmm9M> under the “Student Conduct” tab. Please review this document to understand the Utah State University policy on academic honesty. If you have questions or concerns about the policy, please contact your instructor or academic advisor.

PLAGIARISM

Plagiarism includes knowingly “representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.” The penalties for plagiarism are severe. They include warning or reprimand, grade adjustment, probation, suspension, expulsion, withholding of transcripts, and denial or revocation of degrees.

STUDENTS WITH DISABILITIES

Reasonable accommodation will be provided for all persons with disabilities in order to ensure equal participation within the program. If a student has a disability that will require some accommodation by the instructor, the student must contact the Disability Resource Center (435-797-2444), preferably during the first week of the course. Any request for special consideration relating to attendance, pedagogy, taking of examinations, etc., must be discussed with and approved by the instructor.