

GEOG 494/594: GIS for Water Resources

Course Description

This course will introduce students to real-world examples of how GIS is used to investigate and resolve water-resource issues. Topics include general hydrologic modeling, time-series data integration, watershed characterization, bathymetric modeling, riparian buffer analysis, and fluvial sediment transport. High-resolution digital elevation data, the foundation of these analyses, is discussed throughout the course. The emphasis of this course is to develop useful analytical GIS skills while examining the natural world around you.

It is highly recommended students complete GEOG380, GEOG4/588, and GEOG4/592 (or equivalent) before taking this course.

Required Readings

- Esri ArcGIS Desktop Help: Hydrology Tools
- Journal articles – will be supplied by instructor

Student Responsibilities

Attendance is required; this is especially important for a class that meets only once per week. Students are expected to engage in readings and discussions. Graduate students will write and present a term project.

Grading

Grades for the course include labs and assignments [100% for undergrad, 60% for grad] and a term project (proposal, annotated bibliography, report, presentation) [40% for grads only]. Since research works best when effectively communicated, submitted work will be graded on accuracy, completeness, and design.

Term Project (Graduate Students Only)

All research starts with an idea. This idea needs to be clear, concise, and compelling. Before a scientist can complete a report, or a student can write a term paper, ideas must be flushed out and developed. Graduate students will have the option of choosing an established topic or developing their own idea for a term project. The term project will be divided into four parts: proposal, annotated bibliography, presentation, and final report. Term projects can be completed with groups of no more than two people. More details will follow.

- *Project Proposal – Due January 29*
- *Annotated Bibliography – Due February 26*
- *Presentation – Due March 12*
- *Report – Due March 19*

Please email an appropriately named PDF document (e.g., project_proposal_lastname.pdf) to your instructor by **6:00pm** on the due date. Late term project work will not be accepted.

Labs

Lab exercises are designed for you to develop skills using ArcGIS and to apply the fundamental course concepts to real-world water resource data. Lab exercises are **DUE by 6:00pm** and should be submitted via D2L. It is okay to work with a partner, however **each student is responsible for submitting their own lab report**. Please contact me *prior* to the due date if there is a scheduling conflict. Students taking this course are allowed to access CH469 outside the designated lab hours using their PSU badge. They must submit the CH469 Badge Access Request after receiving the notification send by the geography office. Submitted requests may take up to one week for approval. For those who didn't receive the email notification, please use the following link, or see geography staff at CH424 if you can't access this link:
<https://sites.google.com/a/pdx.edu/geog-ch469/access-form>.

Please submit an appropriately named PDF document (e.g., lab1_lastname.pdf) to D2L.

Assignments

In-class assignments are designed for you to further develop your GIS skills, while familiarizing yourself with ArcGIS. These are **DUE by 6:00pm** and should be submitted via D2L.

Please submit an appropriately named PDF document (e.g., assignment1_lastname.pdf) to D2L.

Late Work

The real world has deadlines, but things happen in life and business. All work should be submitted via D2L which provides a simple time stamp. **Any work (other than term project work) submitted after 6:00pm on the due date is deemed late and will be docked 50 percent. Any work more than a week late will not be accepted and will receive 0 percent.**

Tentative Schedule *(subject to change)*

Week	Date	Lecture/Assignment	Lab
1	1/8	Syllabus Intro. GIS Water Resources (<i>lecture</i>) Cartography (<i>lecture</i>)	Lab 1 Intro. to GIS
2	1/15 <i>Lab 1 Due</i>	Term Projects (<i>lecture</i>) Mammoth Basin GW/WQ (<i>Assignment 1</i>)	Lab 2 3D Analyst
3	1/22	Arc Hydro Tools (<i>lecture</i>) StreamStats (<i>example</i>)	Lab 3 Arc Hydro
4	1/29 <i>Project Proposal Due</i> <i>Lab 2 Due</i>	Mount Jefferson Drainage (<i>Assignment 2</i>) Water Quality (<i>lecture</i>)	Open Lab
5	2/5 <i>Lab 3 Due</i> <i>Assignment 1 Due</i>	Review Proposals (<i>in class</i>)	Lab 4 Water Use

6	2/12 <i>Assignment 2 Due</i>	Bathymetry (<i>lecture</i>) Willamette Harbor Bathymetry (<i>Assignment 3</i>)	Lab 5 Bathymetry
7	2/19 <i>Lab 4 Due</i>	Interpolation (<i>lecture</i>) Rainfall (<i>example</i>)	Lab 6 Rainfall
8	2/26 <i>Annotated Bibl. Due</i> <i>Assignment 3 Due</i> <i>Lab 5 Due</i>	Wetlands (<i>lecture</i>) Lidar Visualization (<i>example</i>)	Lab 7 Riparian
9	3/5 <i>Lab 6 Due</i>	Remote Sensing & Fluvial Geomorphology (<i>lecture</i>)	Open Lab
10	3/12 <i>Presentations Due</i> <i>Lab 7 due</i>	<i>Student presentations</i>	
Finals	3/19 <i>Project Report Due</i>	<i>Student presentations</i> (<i>if necessary</i>)	

As an instructor, one of my responsibilities is to help create a safe learning environment for my students and for the campus as a whole. Please be aware that as a faculty member, I have the responsibility to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination. If you would rather share information about sexual harassment, sexual violence or discrimination to a confidential employee who does not have this reporting responsibility, you can find [a list](#) of those individuals. For more information about Title IX please complete the required student module [Creating a Safe Campus](#) in your D2L.