Syllabus: ENVS 332, Hydrology & Water Resources

Dr. Kaye Savage, Black Science Annex. Office Hours: M, F 2:30 – 3:30 and by appointment

Course Description

Hydrology is the study of flowing water on and through the Earth's surface. As Earth's fresh water resources are limited and unevenly distributed, understanding hydrology is critically important for water supply and management issues.

During the semester, you will learn how properties of rocks and sediments affect fresh water flow and transportation of contaminants, and how these properties affect the availability of surface and ground water for various uses. Some of the time we will meet jointly with ECON 338 – Water: Law, Economics and Policy to provide context for our quantitative studies. Together with students from ECON 338, you will become experts on water in a particular region of the world and lead part of a class period on that topic. The final exam will be a take-home problem analysis and essay. There will be no in-class exams.

Class and lab time

Many concepts in the science of hydrology are expressed mathematically. We will spend some of our class time developing representations of flow that form the basis for practical application of ground water and contaminant transport models. You will learn the most by formulating questions and making sure you understand the concepts, so I encourage you to ask plenty of questions! To that end, I will also ask you questions. Don't be afraid to offer up an answer even if you are not sure. The more you participate, the more you will learn.

This is a four-credit course. On Tuesdays, class and lab are contiguous and we will often use this block of time to work off-campus. Transportation will be provided. Because we will be traveling together, you must arrive on time.

Grade Basis

40% Problem sets (4)
15% Preparation and participation (includes occasional reading responses and lab participation)
10% Student-led class: Presentation and quality of class discussion, abstract, and key points handout
15% Research paper on one aspect of your region of interest
20% Final exam (take-home)

Assigned Texts

Anisfeld, Shimon. *Water Resources*, 2010. Island Press

Harter & Rollins. *Watersheds, Groundwater & Drinking Water*, 2008. ANR Publications

Ball, Phillip. *Life's Matrix: Biography of Water*, 2001. University of California Press

Additional readings will be assigned from time to time. These will be posted on our moodle site.

Honor Code

As in all courses at Wofford College, you are expected to adhere to the honor code. You may find it in its entirety online: 2009-2010 Honor Code

Attendance Policy

You are expected to attend all class and lab meetings unless prevented by illness, emergency, or athletic commitment. Please contact Dr. Savage as soon as you know you will be absent on a particular day.

Schedule: ENVS 332, Hydrology & Water Resources

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Week	Tuesday + lab	Thursday
1	Watershed tour and introduction to project site	Joint with ECON 338 (Surface Water overview)
2	Joint with ECON 338 (Values & Perpsectives); Water budget problems	Joint (Tragedy of the Commons)
3	South Mountains State Park: Work of streams	SW problem analysis [transport; JELs rock]
4	Lockhart dam: Hydroelectric power	SW problem analysis [chemistry I]
5	Drinking water & wastewater treatment plants	SW problem analysis [chemistry II]
6	Chemical sampling & alkalinity	Joint with ECON 338 (Ground Water overview)
7	North Side Project (discharge; water quality)	Aquifer properties
8	Sustainability panel 2:30 - 3:30 Darcy's Law	Flow equations
9	*Spring break*	*Spring break*
10	Kayak on Tyger River: hydraulic features	Joint with ECON 338 (China; SE Asia)
11	Wells; North Side Project (discharge; water quality)	Joint (Ogalalla & Edwards; western US)
12	Joint (SE US; Bangladesh); NS Project (maps)	Pump tests
13	Joint (Amazon; Middle East); GW problem analysis	Joint - Sub-saharan Africa
14	Kayak on Pacolet River: human impacts	Joint - Parting thoughts & discussion