

CEE 599L: Snow Hydrology
 SLN: 18236
 Professor Jessica Lundquist
 jdlund@u.washington.edu

Spring 2007
 Room: Wilcox 264
 Office: Wilcox 165

3 units
 Time: T Th 1:30-2:50
 Office Hours: TBA

Course Overview:

The purpose of this course is to familiarize students with snow hydrology research, with an emphasis on current research methods and results. This is a graduate-level class designed for students with an interest in the impact of snow on hydrology and water resources.

Learning Objectives:

At the end of the quarter, students should be able to:

- 1) Attend a research conference session on snow (or read a recent paper in the field of snow hydrology) and summarize the most important points, evaluate the speaker's/writer's methodology, determine potential sources of errors, and ask intelligent questions.
- 2) Locate, acquire, and quality-control ("clean-up") snow data relevant to basin hydrology.
- 3) Run a snowmelt model for a location over a melt season.
- 4) Interpret satellite-based maps of snow cover and combine spatial maps of snow-covered area with model-based estimates of melt rates to determine how snow accumulation varies over a basin.

Schedule:

Note: This schedule is tentative and may change based on the interests of the class.

	Tuesday	Thursday
Week 1 March 27/29	Introduction/Overview	Basic Properties of Snow/Energy Balance
Week 2 Apr 3/5	Geography/Climate of Snow (North America) and the relative importance of snow to hydrology	Measuring snow (on the ground techniques)
Saturday Field Trip (Apr 7)	To make up for week 4	
Week 3 Apr 10/12	Remote sensing of snow/Project proposal due	Spatial snow distribution (different scales)
Week 4 Apr 17/19	<i>Gone to Snow Conference</i>	<i>Gone to Snow Conference</i>
Week 5 Apr 24/26	Learning about snow from streamflow	Meltwater flow through snow
Week 6 May 1/3	Learning about snow from water chemistry	Rain versus snow/Project update due
Week 7 May 8/10	Snow and Ecology	Snowmelt Modeling
Week 8 May 15/17	Watershed Modeling: Snow and Scale	Long-term hydro-forecasts and snow
Week 9 May 22/24	Project Presentations	Project Presentations
Week 10 May 29/31	Project Presentations	Presentations/wrap-up

Approach:

The design of this course is based on the following key aspects of learning, “To develop competence in an area of inquiry, students must: (a) have a deep foundation of factual knowledge, (b) understand facts and ideas in the context of a conceptual framework, and (c) organize knowledge in ways that facilitate retrieval and application” (How People Learn: Bridging Research and Practice. National Research Council, (1999) p. 10.)

Through readings and participation in discussions students will build their foundations of knowledge and conceptual frameworks. Those frameworks will then be reinforced by applying knowledge to individual projects.

Grading:

40% of your grade will be based on in-class discussions. 60% of your grade will be based on your term project, which will be broken up into parts.

Format:

This is a graduate-level, primarily discussion-based class that meets Tuesdays and Thursdays from 1:30 to 2:50. Your grade will be based on in-class discussions (based on reading) and on a term project combining observations and modeling. The term project will be broken into steps (with pieces due along the way) and will culminate in a short report and presentation at the end of the quarter.

You will be assigned one journal article or book chapter (no more than 10 pages) to read for each class meeting. The class will consist of different reading groups, which will read different but complimentary articles. I will lecture for the first 20-30 minutes of each class period and will present the most important questions/concepts for the day. You will then meet for 10 minutes with the people from your specific reading group, to discuss what your article has to say about the subject. You will then recombine into groups with 1 person from each reading group and will compare how the articles differ and what are the most important points between all of the articles (for about 20 minutes). We will then reconvene the class as a whole, with a different recombined group leading the discussion each week (about 20 minutes). We also use this time to discuss progress and questions on the term project.

Term Project:

Each person will choose a term project related to his/her individual research interests (hopefully somehow related to his/her thesis project). You will write a short 1-2 page proposal of the work to be accomplished, which will be reviewed by fellow students and the instructor (like a mini-NSF review). Students may negotiate to work in groups or alone. More information will be handed out and discussed in class.