Spring 2014 Syllabus
WR616: Hillslope Hydrology and Runoff Processes

Class times: Monday 11:00-11:50 am; Wednesday 11:00-12:40 pm in NESB A302

Instructor: Stephanie Kampf
Office: Natural and Environmental Sciences Building (NESB), B248
Office Hours: Monday 2:00-3:30 pm; Tuesday 3:30-5:00 pm or by appointment
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Course overview and objectives: This is a reading and discussion-based course on runoff processes at hillslope to catchment scale. The objectives are to (1) develop in-depth understanding of runoff processes, (2) gain familiarity with some of the seminal papers in hillslope hydrology, (3) develop skills in peer review of journal articles, and (4) develop skills in synthesizing information from peer-reviewed literature.

Prerequisites: At least one prior course in hydrology (WR416 or equivalent), familiarity with basic concepts and equations in subsurface flow, and familiarity with field measurement techniques in hydrology.

Text: All course readings will be from journal articles provided electronically through RamCT.

Course requirements: During the first half of class, we will read and discuss papers that cover the major concepts and themes in hillslope hydrology and runoff processes. On a rotating basis, each student will be responsible for leading paper discussions and writing paper reviews. During the second half of class, each student will select a focus topic, prepare an annotated bibliography and develop a research proposal on the topic, present a brief overview of the topic to class, and lead a class discussion related to the focus topic.
**Grading and expectations:** You should be fully prepared for each class discussion, which means careful reading of the papers in advance of the class. You are also responsible for active, constructive, and positive participation in the class discussions. At graduate level, you should demonstrate self-motivation and direction, and you should be actively challenging and questioning ideas to make every class meeting as engaging and thought-provoking as possible. Your grade will be based on:

- 10%  Active and constructive participation in class discussions
- 10%  Effective leadership of class discussions
- 30%  Reviews (3 reviews, 10% each)
- 15%  Annotated bibliography
- 10%  Presentation on focus topic
- 25%  Research proposal

Late assignments will not be accepted, but you will have the opportunity to revise and resubmit your assignments based on comments from the class and instructor.

**Academic integrity:** You are responsible for adhering to all university policies on academic integrity ([http://learning.colostate.edu/integrity/index.cfm](http://learning.colostate.edu/integrity/index.cfm)) and student conduct ([http://www.conflictresolution.colostate.edu/conduct-code#conduct](http://www.conflictresolution.colostate.edu/conduct-code#conduct)).
Course outline:

Jan 22: Introduction and course overview

Jan 27: Infiltration excess overland flow

- Horton RE, 1933. The role of infiltration in the hydrologic cycle. Transactions of the American Geophysical Union 14: 446-460.

Jan 29: Subsurface flow


Feb 3: Subsurface flow


Feb 5: Saturation excess overland flow


Feb 10: Channel initiation


Feb 12: Old water and new water


Feb 17: Mobile and immobile water

Feb 19: **Macropores**

Feb 24: **Thresholds**

Feb 26: **Bedrock**

Mar 3: **Soil moisture preferred states**

Mar 5: **Runoff in semi-arid environments**

Mar 10: **Runoff in the humid tropics**
Mar 12:  *Snowmelt runoff*


Mar 24:  No class:  Hydrology Days

Mar 26:  No class:  Hydrology Days

Mar 28:  Possible field trip to ARS hydrology research site

Mar 31 – May 7:  *Student focus topics*