

## Syllabus for Physical Hydrology (GEOL 376S) UT-Austin, Fall 2012

**Instructor:** Bayani Cardenas, [cardenas@jsg.utexas.edu](mailto:cardenas@jsg.utexas.edu), 471-6897, EPS 3.160

**Teaching Assistant:** Peter Zamora, [pbzamora@utexas.edu](mailto:pbzamora@utexas.edu), EPS 3.124C

The **goals** of this course are:

- to provide a quantitative process-based understanding of hydrologic processes
- to provide experience with different methods in hydrology
- to develop learning, problem-solving, and communication skills

**Course Philosophy:** *Learning by doing!*

**Course expectation:** Everyone is to have a positive, fun and mature attitude towards learning and applying hydrologic concepts. Students should demand a lot from us (instructors and teaching assistants) and we will strive to meet these expectations. But in return, we expect the same from the students.

**Other skills to be developed:** Students will use MS Excel (or MATLAB) throughout the class. Other computational software that may be used, such as COMSOL Multiphysics, will be provided by the instructor.

**Lecture hours:** T-Th, 9:30-11 AM in EPS 2.104

**Office hours:** Cardenas: Wednesday 9-10 AM

Zamora: Monday 9-10 AM, Wednesday 10-11 AM, EPS 3.156

**Computer room hours:** TBD

### Required Reading:

The primary textbook is by Dingman, S.L., Physical Hydrology (2008). We will complement the material in Dingman with Hornberger, G. M., J. P. Raffensperger, P. L. Wiberg, and K. N. Eshleman, Elements of Physical Hydrology (1999), JHU Press and possibly with Brutsaert, W., Hydrology: An Introduction (2006). All books will be on reserve in the Geology library.

### Grading:

Two in-class exams	= 20%	(10/23 and 11/27)
Weekly (or bi-weekly) homework	= 50%	(one HW=one letter grade!)
Term paper and presentation	= 20%	
Participation and attitude	= 10%	
<b>Total</b>	<b>= 100%</b>	

This is a lecture-style course, and attendance is important. Interaction during the lecture meetings is encouraged and expected, and a significant percentage of your grade is based on your level of preparation and participation at each class meeting.

There will be no final exam. The philosophy behind this is that if you did most of the homework and studied hard for the two in-class exams, you have learned the material and there is no need for a final assessment.

### **Homework and Exams:**

Homework problems are assigned on Thursdays and are typically due on the following Friday at noon. Turn them in to the TA or to Bayani. Late homework loses 50% after the first day, but will still be worth 50% up until the due date for the next homework. You can hand late homework to the TA any time up until that date. **All work (i.e. calculations and sketches) should be submitted to get full credit.** This will also allow us to give you appropriate credit even if you messed up some calculations.

There are two exams during the regular semester. Each of the midterm exams is worth 10%. Each of the exams is 75 minutes long, and is scheduled on a regular class period.

### **Extra Credit:**

Extra credit homework problems will be offered on a regular basis. This is an excellent opportunity to improve your homework grade and to explore some of the more advanced concepts of the subject.

### **Blackboard:**

All course documents, e.g., homework exercises, powerpoint files of lectures, etc., will be posted on Blackboard. Class-related announcements and communication will also be done through Blackboard.

### **All students, staff and faculty are bound by the honor code of the University of Texas:**

*"The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community."*

Loosely translated: *If you do anything you know you are not supposed to do, there will be consequences.*

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-6441 TTY.

### Tentative Schedule

<b>Week of</b>	<b>Topic</b>	<b>Chapter(s)</b>
8/27	Introduction to Hydrology, Climate	2, 3
9/3	Climate, Rainfall Processes	3, 4
9/10	Rainfall Processes and Measurement	4
9/17	Snow and snowmelt	5
<b>9/25</b>	<b><i>Deadline for choosing term paper topic</i></b>	
9/24	Unsaturated zone and infiltration processes	6
10/1	Unsaturated zone and infiltration processes	6
10/8	Evaporation and transpiration	7
10/15	Evaporation and transpiration	7
<b>10/23</b>	<b><i>First exam</i></b>	
10/22	Runoff processes and stream flow	9
10/29	Watershed and stream network properties	9
11/6	Outline for projects due	
11/5	Flood routing and stream flow analysis	9
11/12	Groundwater hydraulics	8
11/19	Groundwater hydraulics	8
<b>11/27</b>	<b><i>Second exam</i></b>	
11/26	Term project presentations	
12/3	Term project reports due (5 pm)	

Holidays

9/3 Labor Day

Travel dates for the instructor (make-up classes may be scheduled if I can't find a 'sub')

9/6, 11/6