

NRES 853 & CIVE 353/853
Hydrology
Spring 2012
Revised 01-09-2012

Schedule: Lecture: 4:00-5:15 pm Tuesday/Thursday. Room: Hardin Hall 163 (East Campus)

INSTRUCTORS:

Faculty Instructor:

Diego Riveros-Iregui
519 Hardin Hall
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OBJECTIVES:

Following this course, students will:

- Be competent in discussing and applying the basic concepts of watershed hydrology and hydrologic processes, and will have a basic understanding of the earth's hydrologic cycle and its components.
- Be proficient in analyzing hydrologic data using many of the standard methods used within the discipline of hydrology.
- Be literate in preparing reports of hydrologic studies.
- Be knowledgeable in applying fundamental hydrologic principles in water resources management.

METHOD:

The course is taught in a lecture format with several home assignments.

TEXT:

Physical Hydrology, S. Lawrence Dingman, 2002, Waveland Press (2nd Edition)

LECTURES/NOTES/ASSIGNMENTS:

Lectures will be presented as PowerPoint presentations. These presentations along with all other notes and assignments will be posted on Blackboard (typically prior to each series of lectures). The instructor reserves the right to make last minute updates or additions to the notes.

HOMEWORK:

Homework assignments will be given to provide students with experience solving practical problems in hydrology and as preparation for problems on the exams.

GRADING:

	Percent of grade	In general, the following grading system will apply:
Graded Homework	25	A+ 97-100%
Examinations (3)	<u>75</u>	A 93-96
	100	A- 90-92
* Graduate students in the class will have an additional assignment to be computed as a homework		B+ 87-89
		B 83-86
		B- 80-82
		C+ 77-79
		C 73-76
		C- 70-72
		D+ 67-69
		D 63-66
		D- 60-62
		F <60

Class participation is expected. The instructor will especially call upon those who do not actively participate in class in efforts to promote participation from every student in class.

Missed examinations must be cleared with the instructor ahead of time. No make-up exams will be given to students that have not notified the instructor ahead of the absence.

Due dates will be given on homework and reports. **NO LATE HOMEWORK WILL BE ALLOWED.** Special circumstances regarding homework deadlines must be arranged with the instructor in advance when possible. All work should be well organized and neat. Poorly written reports will not be accepted. Spelling and grammar will be considered in grading reports. Since a significant portion of the course grade is based on class participation and graded homework and reports, students should place priority on timely preparation of high quality homework and be active participants in class.

Turn off your cell phone during class.

ATTENDANCE POLICY:

The attendance policy as listed in the schedule of classes for UNL will be adhered to. Students

are responsible for the material presented in lecture or laboratory periods. It is your responsibility to acquire lecture notes, handouts or exercises for missed class periods.

CHEATING/PLAGIARISM:

Please review Section 4 of UNL's Student Code of Conduct for definitions and warnings against cheating and plagiarism. UNL's policy on Academic Dishonesty states that a student may receive a sanction as severe as removal from a course with a failing grade for any type of Academic Dishonesty. I will not tolerate cheating or plagiarism. If you are caught cheating or plagiarizing you will be removed from the course and receive a failing grade. Remember that plagiarism goes beyond copying someone else's work "word-for-word". It includes using ideas without proper citation. It is essential, therefore, that you acknowledge the ideas of other scientists (including your classmates) in all of your written work and reports. Failing to properly cite ideas is as serious as copying your friend's homework.

FIFTEENTH WEEK POLICY:

This course adheres to UNL's policy, previously referred to as "Dead Week Policy". The policy states:

"Final examinations for full semester classes are to be given ONLY at the regularly scheduled time as published in the Official Schedule of Classes or at another time DURING FINALS WEEK mutually agreeable to all concerned.

"The only examinations that may be given during the last week (15th week) of classes are: laboratory practical examinations, make-up or repeat examinations, and self-paced examinations. However, the following must be applied:

"Projects, papers, and speeches scheduled for completion during the last week (15th week) of classes must have been assigned in writing by the end of the eighth week. This stipulation refers to the project and its scope, but not the topic. Moreover, ALL requirements, except for the final exam, must be completed no later than Wednesday of the fifteenth week. However, if the instructor has assigned a project, paper, or speech by the eighth week to replace the final, then the project, paper, or speech may be completed any time in the 15th week or finals. The exception to this is a class meeting one day a week on a Thursday or Friday for which all policies/requirements are shifted to either a Thursday or Friday, respectively."

TENTATIVE COURSE OUTLINE FOR 2012:

DATE	TOPIC	READING	ASSIGNMENTS
1/10	Introduction to the class		
1/12	Introduction to the Water Cycle & Water Balance Equation	Chapter 1, Appendix A & B	
1/17	The Watershed	Chapter 2, Appendix D & E	
1/19	Hydrologic Systems and Watersheds	Chapter 2, Appendix D & E	
1/24	Hydrologic variability & Precipitation	Chapters 2, & 4	Homework 1 – Precipitation & Snow Assigned
1/26	Precipitation – Point/Areal Measurement	Chapter 4	
1/31	Snow and Snowmelt – Material Characteristics, Formation, Metamorphism	Chapter 5	
2/2	Snow and Snowmelt – Melt Processes, Water movement within the snow pack.	Chapter 5	Homework 1 Due
2/7	EXAM 1 – Material From 1/10 to 2/2	Chapters 1, 2, 4, & 5	
2/9	Evapotranspiration – Evaporation and Turbulent energy exchange, ET processes	Chapter 7 Read - D’Odorico et al., 2010, Bioscience 60: 898-907.	Homework 2 – ET Assigned
2/14	Evapotranspiration – measurement methods, transpiration, PET vs AET	Chapter 7	

DATE	TOPIC	READING	ASSIGNMENTS
2/16	Principles of Ecohydrology – Water-Ecosystem interactions, water use efficiency, carbon fluxes	Chapter 7	
2/21	Soil Hydrology – Properties, hydraulic conductivity, storage, porosity	Chapter 6	Homework 2 Due Homework 3 – Water in Soils Assigned
2/23	Soil Hydrology – water flow in unsaturated zone	Chapter 6	
2/28	Soil Hydrology – Infiltration, percolation, recharge and flow modeling	Chapter 6	Homework 3 Due
3/1	Ground Water – aquifer types & storativity	Chapter 8	Homework 4 – Groundwater Assigned
3/6	EXAM 2 – Material From 2/9 to 3/1	Chapters 6 & 7	
3/8	Ground Water – Darcy's equation, head, hydraulic conductivity, water table	Chapter 8	Lecture by Dr. Liyin Liang
3/13	Ground Water – flow nets and Topodrive program.	Chapter 8	
3/15	Ground Water – ground water-surface water interaction & wells.	Chapter 8	
3/20	Spring Break		
3/22	Spring Break		
3/27	Ground Water – groundwater flow in confined & unconfined aquifers	Chapter 8	

DATE	TOPIC	READING	ASSIGNMENTS
3/29	Surface Water – basic aspects, channel properties, hydrograph separation	Chapter 9, (Appendix C)	Homework 4 Due Homework 5 – Surface Water Assigned
4/3	Surface Water - Stream channels, riparian zones, and geomorphology	Chapter 9 Read - Montgomery & Dietrich, 1988, Nature 336:232-234.	
4/5	Surface Water – determining stream discharge: flow velocity, stream gaging, staff gages, rating curves, weirs, & flumes	Chapter 9, Appendix F	
4/10	Surface Water – overland flow, event-response mechanisms	Chapter 9	
4/12	Surface Water – The Rational Method		
4/17	Surface Water – open channel flow, routing, Manning’s equation for roughness	Chapter 9	Homework 5 Due
4/19	Grad student presentations		
4/24	Grad student presentations		
4/26	Grad student presentations		
Finals Week	Exam 3 – Material From 3/8 to 4/26 Monday, April 30 1:00-3:00 PM		