

**Oregon State university**  
**School of Civil and Construction Engineering**  
**CE 412/512 HYDROLOGY (4 Credits) Spring 2013**

**Instructor:** Dr. Arturo Leon, Office: 213 Owen (**2nd floor Owen Lobby**),  
Email: [arturo.leon@oregonstate.edu](mailto:arturo.leon@oregonstate.edu)

**Meeting time for Lectures:** Tuesday/Thursday 4:00-5:50pm (216 Covell)

**Instructor Office hours:** Tuesday/Thursday 2:30-4:00pm (**213 Owen, 2nd floor Owen Lobby**).

**Teaching Assistant (TA):**

**Kelli Walters** ([waltersk@onid.orst.edu](mailto:waltersk@onid.orst.edu), **Kearney 211**) [Quizzes, In-class assignments and Exams]  
**Hyoungsu Park** ([parkhyo@onid.orst.edu](mailto:parkhyo@onid.orst.edu), **Graf 304**) [Homeworks]

**TA Office hours:**

**Kelli Walters** (Wednesday and Friday 10-12 pm)  
**Hyoungsu Park** (Monday 10-11 am, Tuesday 10-12 pm)

**Textbook:** Bedient, P.B., W.C. Huber and B.E. Vieux, Hydrology and Floodplain Analysis, Prentice-Hall, Fifth Edition, 2012.

**Textbook webpage:** <http://doctorflood.rice.edu/bedient/handouts.html>

**Catalog Description:** CE 412/512 HYDROLOGY (4). Fundamentals of hydrology, the hydrologic cycle, precipitation, streamflow, hydrograph analysis and hydrologic measurements.

**Course Information:**

All course emails and web postings will be made using the Blackboard course management software. You will need to regularly login ([my.oregonstate.edu](http://my.oregonstate.edu)) to check course announcements, download in-class example solutions, and access posted homework solutions. Please read your campus email daily.

At the end of the term, all course materials will be posted at the course webpage: [http://web.engr.oregonstate.edu/~leon/Teaching\\_hydrology.html](http://web.engr.oregonstate.edu/~leon/Teaching_hydrology.html).

**Student Learning Outcomes:**

1. Apply principles of mass conservation to the hydrologic cycle.
2. Interpret measurements and estimates of components of the hydrologic cycle.
3. Relate rainfall and runoff and apply methods for estimation of runoff and downstream flow.
4. Perform flood frequency analysis and related applications of statistics and probability to hydrology.
5. Estimate parameters and obtain data for problem solving in hydrologic engineering.

**Professionalism:** Professional behavior is expected from all students in this class. Examples of *un-professional* behavior include arriving late for class; talking while someone else is talking; eating, drinking, or sleeping in class; inappropriate cell phone or notebook computer use; or any behavior that interferes with other students ability to learn or that shows disrespect for others.

**Academic Dishonesty:** At Oregon State University academic dishonesty is defined by the Oregon Administrative Rules 576-015-0020.1.a-c as: *An intentional act of deception in which a student seeks to claim credit for the work or effort of another person or uses unauthorized materials or fabricated information in any academic work.* Academic dishonesty includes:

**CHEATING** - use or attempted use of unauthorized materials, information or study aids or an act of deceit by which a student attempts to misrepresent mastery of academic effort or information. This includes unauthorized copying or collaboration on a test or assignment or using prohibited materials and texts.

**FABRICATION** - falsification or invention of any information (including falsifying research, inventing or exaggerating data and listing incorrect or fictitious references).

**ASSISTING** - helping another commit an act of academic dishonesty. This includes paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, or taking a test/doing an assignment for someone else (or allowing someone to do these things for you). It is a violation of Oregon state law to create and offer to sell part or all of an education assignment to another person (ORS 165.114).

**TAMPERING** - altering or interfering with evaluation instruments and documents.

**PLAGIARISM** - representing the word or ideas of another person as one's own OR presenting someone else's words, ideas, artistry or data as one's own. This includes copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project, then submitting it as one's own.

For more information about the University's policies and procedures in this area see the Student Conduct web site at: <http://oregonstate.edu/admin/stucon/achon.htm>.

**Special Assistance:** Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should immediately contact the Students with Disabilities Office, Room A200, Kerr Admin. Building, 737-4098 or T.D.D. 737-3666, e-mail [Disability.services@orst.edu](mailto:Disability.services@orst.edu).

### **Calculator Requirement for CE and CEM students**

The School of Civil and Construction Engineering has adopted a School-wide policy that mirrors the list of calculators allowed on NCEES (National Council of Examiners for Engineering and Surveying) exams including the Engineer in Training (EIT) taken by most engineering students near graduation. Only the below calculators will be allowed in CE, CCE and CEM courses.

**Casio:** All fx-115 models. Any Casio calculator must contain fx-115 in its model name. Examples of acceptable Casio fx-115 models include (but are not limited to)

- fx-115 MS
- fx-115 MS Plus
- fx-115 MS SR
- fx-115 ES

**Hewlett Packard:** The HP 33s and HP 35s models, but no others.

**Texas Instruments:** All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name. Examples of acceptable TI-30X and TI-36X models include (but are not limited to)

- TI-30Xa
- TI-30Xa SOLAR
- TI-30Xa SE
- TI-30XS Multiview
- TI-30X IIB
- TI-30X IIS
- TI-36X II
- TI-36X SOLAR

**LECTURES:** Theory and practice will be presented mostly from the textbook, however additional material will be used from various sources. Example problems will be solved in class. Students are responsible for all lecture and recitation material. There is no attendance policy, however, there will be a significant amount of information that will be covered in class that is not found in the textbook.

**READINGS:** Readings are assigned from the textbook and handouts that will be provided (see Table 1).

### IN-CLASS PARTICIPATION

Please bring your textbook, a calculator, and scrap paper to each class. You will periodically be participating in the solution and discussion of in-class example problems. You will work in small groups while solving these problems. Each group will hand in their attempt to solve the problem with each member's name on the paper. Simply attempting the solution will result in full participation credit for the day. However, just writing your name and the problem on a piece of paper is insufficient and will not receive credit. These in-class exercises will require that you **complete the assigned readings** prior to the beginning of each class.

### QUIZZES

Bi-weekly quizzes will be used to assess your understanding of the course material. **Quizzes will be closed-book and closed-notes. Make up quizzes will not be given.** In the event of an excused absence (documented illness, family emergency, etc.), a missing quiz grade will be replaced by the average of your grades on the remaining quizzes. These situations must be brought to my attention immediately (before the quiz, and not after the quiz). In the event of an unexcused absence, no accommodation can be made. The quiz will include questions based on the reading material (Bedient) and the in-class lecture discussions.

**HOMEWORKS:** Bi-weekly homework problems will be assigned mostly from textbook. Homework is due at the **beginning of class** on the due date. Late homework **will not** be accepted. If you will be out

of town, make arrangements to have a friend turn in your homework for you, or turn it in early directly to the TA or me. Feel free to discuss your homework with your classmates. However, **you need to submit an individual homework! Group submissions will not be accepted.**

Each assignment requires:

1. Your name on each page of stapled solutions
2. A legible and well organized step-by-step presentation (in pencil) of the solutions (include problem diagrams)
3. Boxed answers presented with proper units (when applicable)

Assignments not meeting these standards will not be accepted. Solutions will be made available after your assignments have been collected.

**EXAMS:** One mid-term and a final exam will be given as indicated in Table 1. **The mid-term and final exam will be open-book and open-notes.** No electronic devices other than NCEES calculators may be used in the tests (see calculator policy).

<b>Grading:</b>	In-class Participation .....	10%
	Quizzes .....	30%
	Homework .....	20%
	Mid-Term .....	20%
	Final Exam .....	<u>20%</u>
		100%

Curved grading **MAY** be used if necessary.

Letter grades will be based on the weighted average specified above and assigned as follows:

<b>A</b>	>= 95%	<b>B-</b>	75-79.99%	<b>D</b>	52-59.99%
<b>A-</b>	90-94.99%	<b>C+</b>	70-74.99%	<b>F</b>	< 51.99%
<b>B+</b>	85-89.99%	<b>C</b>	65-69.99%		
<b>B</b>	80-84.99%	<b>C-</b>	60-64.99%		

**Table 1: Course Schedule Spring 2013**

Wk	Date	Day	Lecture	Topic/Reading	Quiz	HW
1	April 2	T	1	<b>Initial assessment.</b> Introduction to hydrology, weather systems, hydrologic cycle (pp. 1-23)		HW1 out (Lec 1-3)
1	April 4	Th	2	Water balance (pp. 37-43). Precipitation measurement, descriptive statistics, analysis, analyzed data, IDF curves, averaging. Thiessen and isohyetal methods, missing data. (pp. 23-37)		
2	April 9	T	3	Continuation on Precipitation measurement, descriptive statistics, analysis, analyzed data, IDF curves, averaging. Thiessen and isohyetal methods, missing data. (pp. 23-37)		
2	April 11	Th	4	Evaporation and Transpiration. Infiltration, Horton method, $\phi$ -index (pp. 57-58, 112-128).		HW1 due HW2 out (Lec 4-5)
3	April 16	T	5	Green-Ampt infiltration (pp. 128-138)	Quiz 1 (Lec 1-3)	
3	April 18	Th	6	Hydrographs, baseflow separation, unit hydrograph (UH), UH derivations, S-curves, instantaneous UH, synthetic unit hydrographs, SCS methods, applications. (pp. 44-56, 74-108, 138-146).		
4	April 23	T	7			HW2 due HW3 out (Lec 6-10)
4	April 25	Th	8		Quiz 2 (Lec 4-5)	
5	April 30	T	9	Flood routing, hydrologic and hydraulic routing, Storage concepts. (pp. 229-245).		
5	May 2	Th	10	Storage-indication method, volume-depth-area relationships (pp. 245-251).		
6	May 7	T	11	Governing equations for hydraulic river routing, movement of a flood wave, Kinematic wave routing, hydraulic river routing (pp. 253-280)		HW3 due HW4 out (Lec 11, 14, 15)
6	May 9	Th	12	<b>Mid-term Review</b> (Lec 1-10)	Quiz 3 (Lec 6-10)	
7	May 14	T	13	<b>Mid-term (Lec 1-10)</b>		
7	May 16	Th	14	Rational method, examples, Urban problems, major-minor drainage (pp. 359-367, 396-398, 549-551)		
8	May 21	T	15	Concepts of flood frequency analysis, time series, moments, return period, annual and exceedance series, flow-duration curve (pp. 160-182).		
8	May 23	Th	16	Binomial, risk/reliability Normal distribution, flood frequency, lognormal, Gamma, Log-Pearson 3. Graphs, plotting, distribution comparisons, misc. flood frequency, Flood frequency examples (pp. 183-211).		HW4 due HW5 out (Lec 16-18)
9	May 28	T	17		Quiz 4 (Lec 11, 14, 15)	
9	May 30	Th	18			
10	June 4	T	19	Video "Mystery of Missoula Floods"		HW5 due
10	June 6	Th	20	<b>Final Exam Review</b>	Quiz 5 (Lec 16-19)	
11				<b>Final Exam</b>		