

Spring 2005

Course Number	CE 364
Title	Water Resources Engineering
Section	001
CRN(s)	60407
Credits	4
Design Credits	2
Prerequisite(s)	Hydraulics, CEE 362, or equivalent
Days/Time	MW 2:00 – 3:50 pm
Location	SB2 155
Final Exam Day/Time	Wednesday, June 8 th 12:30 – 2:20 pm

Course Website	http://www.ce.pdx.edu/~gwynn/WRE.html
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Instructor	Gwynn R. Johnson
Office	432 Science Building 2
Phone	503-725-8710
E-mail	gjohnson@pdx.edu
Office Hours	Tuesdays 12:30 – 4:00 pm and by appointment
Mailbox Location	CEE Office, Science Building 2, Room 128

Required Text:
Hydrology and Hydraulic Systems, 2nd ed., R.S. Gupta, Waveland Press, 2001. Required.

Catalog Course Description:

Principles of hydrology and hydraulic engineering applied to water supply systems design. Collection and distribution, pump stations, water quality and treatment, economic considerations.

The main objective of this course is to develop technical competence in water resources engineering analysis of water demand, supply, storage, transport, distribution, and stormwater management. The course develops teamwork and communication skills. It provides experiences in realistic water resources engineering problems and issues.

Course Requirements:

Attendance is not mandatory in this course. Students are strongly advised to attend class as there tends to be a direct link to student performance with attendance. Furthermore, please keep in mind the students are **solely** responsible for the lecture material, homework assignments as announced, as well as any other announcements delivered in class.

Students are responsible for the material in the text as it follows the lecture material. It is in your best interest to stay abreast of the required reading material. For your convenience, a course schedule with lecture subjects and associated reading assignments is attached to this syllabus.

All written responses in this course shall be in your own words. ***As per PSU policy, acts of academic dishonesty will result in a failing grade on the exam or assignment for which the dishonesty occurred, disciplinary probation, suspension or dismissal from the University.***

Course Grading

Assignment	% of Total Grade
HOMEWORK (See note below)	40 (students have the option to drop a low grade on any one assignment)
MIDTERM Attendance is mandatory	30
COMPREHENSIVE FINAL EXAM Attendance is mandatory	30

Please note: No make-up exams will be given. You must be in attendance for all exams to receive credit.

Please note: Weekly homework will be assigned. Each assignment will be due one week after it is posted or assigned in class unless otherwise noted by the instructor. Each assignment is due at the beginning of class. **No Late Homework** will be accepted.

All assignments should be completed by hand (unless otherwise noted) on green grid "Engineer's Computation Pad" paper. All assignments (as well as class participation) should be presented in a professional manner. Attention to detail on class assignments and communication is an important part of the learning experience in this course.

In the event an assignment requires submission of graphics, **hand-drawn graphics will not be accepted.** The students are advised to select and employ their favorite spreadsheet program accordingly.

Incompletes: A grade of "I" is granted by the instructor *only* with prior approval and consent. Criteria are outlined in the PSU Bulletin.

Program requirements: {for UG courses} The CEE Department requires that junior and senior engineering courses must be completed with a minimum grade of C-, and a student's cumulative PSU GPA must be 2.25 or higher to graduate from the BSCE program.

Course Objectives and Goals

After completing this course, students should demonstrate the ability to:

1. Recognize and define the terminology associated with components of the hydrologic cycle relevant to water resources (supply and management).
2. Interpret data associated with those measured components of the hydrologic cycle including precipitation, runoff, and evaporation/transpiration.
3. Recognize the major characteristics of water bearing formations including ranges of porosity and hydraulic conductivity.
4. Describe major concepts associated with pumping wells including overall well hydraulics, the cone of depression and radius of influence.
5. Interpret data from aquifer pump tests to discern properties of an aquifer system.
6. Recognize stream gaging (hydrometry) and the application of stage discharge relationships to quantify runoff/overland flow.
7. Estimate storm conditions from the characteristic shapes of hydrographs as well as the use of the unit hydrographs for estimating relevant components of the hydrologic cycle.
8. Discern the storage requirements and the design of storage reservoirs to address fluctuating needs for water supply.
9. Describe pipe flow including critical flow and partially filled pipes (open-channel flow) including the use of Manning's equation in partially filled pipes.
10. Analyze pipe flow in distribution systems employing the equivalent pipes approach as well as network pipe analysis.

<u>Date</u>	<u>Topic</u>	<u>Reading Assignment</u>
March 28 - 30	Syllabus; Introduction and Course Overview Water Management Laws and Hydrologic Cycle Population Forecasting, Irrigation Demand	Ch. 1
April 4 - 6	Water Use and Supply, Precipitation, Evapotranspiration, Infiltration Theory	Ch. 2
April 11 - 13	Theory and Applications of Groundwater Flow	Ch. 3 and 4
April 18 - 20	Continued. Surface Water Supply	Ch. 6 and 7
April 25 - 27	Continued.	
May 2	Open (Possible exam review)	
May 4	Midterm Exam	
May 9 - 16	Storage: Requirements and Design.	Ch 9
	Review of Open Channel Water Distribution, Pressure Conduits and Pumping Design of Water Distribution Systems	Ch. 10 and 11
May 18	Design of Sanitary Sewer Systems	Ch. 13
May 23 - 25	Continued. Design of Storm Drainage Systems	
May 30	Memorial Day – Class Canceled	
June 1	Continued. Last day of class.	
June 8 Wednesday	Comprehensive Final Exam	12:30 – 2:20 pm

Suggested Reading Sections to Support Class Material:

<u>Chapter in Course Textbook</u>	<u>Sections</u>
1	1 through 12
2	1 through 7, 10, 11, 13
3	4 through 11
4	2 through 5
6	1 through 5, 9 through 13, 16 through 18
7	1 through 10, 12
9	1 through 4
10	1 through 9, 13

11	1 through 10
13	1 through 11

Ethics and Professionalism

As future professional engineers you should plan to take the FE Exam (see the Oregon State Board of Examiners for Engineering and Land Surveying at www.osbeels.org), and you should be familiar with the ASCE Code of Ethics (www.asce.org/inside/codeofethics.cfm), which includes the following:

Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the engineering profession.

The PSU Student Conduct Code prohibits all forms of academic cheating, fraud, and dishonesty. Further details can be found in the PSU Bulletin. Allegations of academic dishonesty may be addressed by the instructor, and/or may be referred to the Office of Student Affairs for action. Acts of academic dishonesty may result in a failing grade on the exam or assignment for which the dishonesty occurred, disciplinary probation, suspension or dismissal from the University. The students and the instructor will work together to establish optimal conditions for honorable academic work. Questions about academic honesty may be directed to the Office of Student Affairs (<http://www.ess.pdx.edu/osa/>).

Resources

As a PSU student, you have numerous resources at your disposal. Please take advantage of them while you are here. A small sample is listed below:

- CE Website (includes program info, job listings, etc.): <http://www.cee.pdx.edu/>
- Career Center: <http://www.career.pdx.edu/>
- Center for Student Health & Counseling: <http://www.shac.pdx.edu/>
- The Writing Center: <http://www.writingcenter.pdx.edu/>
- PSU Disability Resource Center: 435 Smith Memorial Union

Note: The PSU Disability Resource Center is available to help students with academic accommodations. If you are a student who has need for test-taking, note-taking or other assistance, please visit the DRC and notify the instructor at the beginning of the term.

Campus Safety

The University considers student safety paramount. The Campus Public Safety Office is open 24 hours a day to assist with personal safety, crime prevention and security escort services. Call 503-725-4407 for more information. For Campus emergencies call 503-725-4404.