

Colorado State University
Department of Civil and Environmental Engineering
Fall 2007
CE 531 - Groundwater Hydrology (3-0-0)

Course Description: CE531 is a survey of the geologic and hydrologic factors controlling the occurrence, movement, and development of subsurface water. Applications to groundwater resource development, management, and groundwater contamination are presented.

Course Objectives: (1) Introduce the fundamentals of subsurface fluid flow and chemical transport, (2) develop an understanding for solving basic hydrogeologic problems, (3) provide an overview of current issues in the field of hydrogeology, and (4) provide a basis for further, applied groundwater coursework.

Instructor: Dr. Domenico Baù, Room B206 Engineering Building, phone: 491-6060, email: domenico.bau@colostate.edu, office hours: Tue.-Thu., 1:00-2:00 pm, or by appointment.

Textbook: F.W. Schwartz and H. Zhang: Fundamentals of Groundwater. John Wiley and Sons, New York. ISBN 0-471-13785-5, 2003, 583 pages.

Class website: <http://ramct.colostate.edu>

Class Schedule and Location: lectures will be given 11:00 am-12:15 pm, Tuesday and Thursday, in room ENGRG B3.

Organization

- Reading will be assigned for each lecture. The reading assignments will not necessarily duplicate the lecture material and students are responsible for knowing both the lecture and reading material.
- Problem assignments will be given out each week and will be due the following week by 2 pm, unless differently specified. Homework solutions will be posted on the class website after the homework assignments are handed back.
- Two midterm exams and a final exam will be given. The exams will cover material from the lectures, reading, and homework assignments. Midterm exams will be held during class time, whereas the final exam will be given according to the time scheduled by the University (see Course Schedule).

Grading

The grading breakdown is as follows.

- Homework 40% (*)
- Midterm Exams (2) 20% each
- Final Exam 20%

*Twenty percent of the total possible points will be deducted for each workday that a homework or laboratory assignment is late. Late homework will not be accepted after the homework assignments are handed back. Homework grading will not be discussed beyond one week after the homework due date.

Guidelines for the Submission of Homework

Homework assignments turned in by students must follow a format similar to that used by professional engineers. A portion of the homework grade will be allotted to formatting. Assignments should be written clearly on one side of either blank or engineering paper. The solution should be developed in logical steps, with immediate and final answers highlighted (e.g. by underlining or boxing). Diagrams or graphs should be given when necessary. The diagrams and graphs should be clearly labeled and contain enough information so that they can stand alone. When information from reference materials (e.g. textbooks or handouts) is drawn upon, the reference should be properly cited. Cover sheets for the problem assignments are not necessary.

Students can work in groups on homework and laboratory assignments; however each student must write his/her own homework. Copying or using scoop will not be tolerated.

Course Schedule

Week	Lectures/ Exams	Lecture Topic	Reading *
1	Aug. 21 Aug. 23	Introduction, Hydrologic Cycle Hydrologic Cycle, Water Balance	Chap. 1 Chap. 1
2	Aug. 28 Aug. 30	Aquifer Properties and Types Hydraulic Conductivity, Darcy's Law	Chap. 3 Chap. 3
3	Sept. 4 Sept. 6	Hydraulic Head, Permeameters Storage	Chap. 3 4.1-4.2
4	Sept. 11 Sept. 13	Homogeneity and Isotropy, Compressibility and Effective Stress Groundwater Flow in Saturated Media	Handout Chap.5
5	Sept. 18 Sept. 20	Analytical Solutions, Flow Nets Flow Nets	Chap. 5 Chap. 5
6	Sept. 25 Sept. 27	Review Midterm 1	
7	Oct. 2 Oct. 4	Groundwater Flow in Unsaturated Media	6.1-6.5 Handout
8	Oct. 9 Oct. 11	Well Hydraulics, Confined Aquifers, Analytical Solutions, Aquifer Testing	Chap. 9
9	Oct. 16 Oct. 18	Well Hydraulics, Leaky Aquifers, Analytical Solutions, Aquifer Testing	Chap. 10
10	Oct. 23 Oct. 25	Well Hydraulics, Unconfined Aquifers, Analytical Solutions, Aquifer Testing	Chap. 11
11	Oct. 30 Nov. 1	Slug Tests Superposition and Bounded Aquifers	Chap. 12 Handout
12	Nov. 6 Nov. 8	Review Midterm 2	
13	Nov. 13	Water Quality	Handout

	Nov. 15	Groundwater Contamination	Handout
14	Nov. 27 Nov. 29	Theory of Groundwater Transport, Analytical Solutions	Chap. 19 Handout
15	Dec. 4 Dec. 6	Groundwater Flow and Transport Modeling	Handout
16	Dec. 10 3.40-5.40pm	Final Exam	