

SYLLABUS

GEO-SCI 587

Spring 2008

Instructor: David Boutt
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545-2724, 138B Morrill II
Office Hours: M 1:10-3:00
or by appointment

Class hours:
MWF: 10:10-11:00 161 Morrill IV
Lab hours:
Wednesdays 2:30-5:30 161 Morrill IV

Text: *Fundamentals of Groundwater,*
Schwartz and Zhang (2003)

Class Website: <http://www.geo.umass.edu/courses/587/index.html>

General:

This course serves as an introduction to hydrogeology with extensive homework sets, laboratory exercises, and a field trip or two. We will explore the origin and distribution of groundwater, including the physical mechanisms responsible for these distributions. This will be an intensely quantitative course that will draw on your mathematical skills. Knowledge of differential and integral calculus will better help you understand certain concepts, but is not crucial. The last portion of the course will explore aspects of numerical modeling of groundwater flow as well as basic components of contaminant transport. Upon completing this course you should be well equipped to analyze various hydrogeological datasets as well understand the foundations upon which the analyses have been built. We will have two exams that test topics covered in class that will encourage you to pull ideas and concepts from various parts of the course to solve challenging problems. In addition, we will have occasional paper discussions which I expect each student to lead the class through the important aspects and concepts. More information will follow on this. I expect you to attend each class and contribute in class discussions.

Labs:

We will have approximately 12-14 labs. Labs will meet on Wednesdays and we will take field trips, have labs at Amherst College, and in the computer labs as necessary. These locations will be announced in class with ample warning. Labs will emphasize concepts introduced in class and bring a physical hands-on experience to hydrogeology. The first 8 or so labs will held indoors while the remaining labs will be in the field. See the additional information sheets for lab details.

Course grading:

Midterm = 20 %, Final = 20 %, Homework = 30 %, Laboratory = 25 %, Paper Discussion = 5%

Late homework and lab reports will not be tolerated. My policy is to deduct 10 pts (on a 100 point scale) for every day a homework or laboratory report is late.

<u>Approximate Date</u>	<u>Topic</u>	<u>S&Z chapter</u>
(M) January 28 th	Hydrogeology and the Water Cycle	1
(W) January 20 th	Surface water hydrology	2
(F) February 1 st	Darcy's Law/ Hydraulic Head	3
(M) February 4 th	Darcy's Law/ Hydraulic Head	3
(W) February 6 th	Porosity/ Hydraulic Conductivity	3
(F) February 8 th	Hydraulic Conductivity	3
(M) February 11 th	Storage Coefficient	4.1-4.2

****Last Day to Add/Drop with no record****

(W) February 13 th	Storage Coefficient	4.1-4.2
(F) February 15 th	Groundwater in Sediments	4.3-4.5
Note: Monday February 18 th is Presidents Day, Tuesday the 19 th will follow Monday Schedule		
(Tu) February 19 th	Groundwater in Sediments	4.3-4.5
(W) February 20 th	Groundwater in Crystalline and Fractured Rocks	4.3-4.5
(F) February 22 nd	Groundwater in Crystalline and Fractured Rocks	4.3-4.5
(M) February 25 th	Continuity Equation /Laplace's Equation	5.1-5.5
(W) February 27 th	Laplace' Equation / Flow Nets	5.4-5.5
(F) February 29 th	Flow Nets	5.4-5.5
(M) March 3 rd	Steady-State Well Hydraulics	9.1-9.2
(W) March 5 th	Steady-State Well Hydraulics	9.1-9.2
(F) March 7 th	Transient Well Hydraulics	9.3-9.8
(M) March 10 th	Transient Well Hydraulics	9.3-9.8
(W) March 12 th	Transient Well Hydraulics	9.3-9.8
(F) March 14 th	Midterm Exam	
(M) March 17 th	NO CLASS – SPRING BREAK!!	
(W) March 19 th	NO CLASS – SPRING BREAK!!	
(F) March 21 st	NO CLASS – SPRING BREAK!!	
(M) March 24 th	Superposition, Image Well Theory	13
(W) March 26 th	Drawdown Hydrographs	4.3-4.5
(F) March 28 th	Groundwater Exploitation	15.1-15.2
(M) March 31 st	Water-Level Fluctuations	
(W) April 2 nd	Well Drilling	
(F) April 4 th	Unsaturated Flow	6.1-6.5
(M) April 7 th	Unsaturated Flow / Infiltration	6.1-6.5
(W) April 9 th	Infiltration	
(F) April 11 th	Regional Groundwater Flow	8.1-8.5
(M) April 14 th	Regional Groundwater Flow	8.1-8.5
(W) April 16 th	Aqueous Geochemistry	16.1-16.5, 17.1
(F) April 18 th	Aqueous Geochemistry	16.1-16.5, 17.1
Note: April 21 st is Patriot's Day and is a Holiday – No Class, Wednesday follows Monday schedule		
(M) April 21 st	NO CLASS	
(W) April 23 rd	Groundwater Contamination	19.1-19.6
(F) April 25 th	Groundwater Contamination	19.1-19.6
(M) April 28 th	Groundwater Contamination	19.1-19.6
(W) April 30 th	Salt Water Intrusion	8.7
(F) May 2 nd	Simulation Methods	15.3-15.6
(M) May 5 th	Simulation Methods	15.3-15.6
(W) May 7 th	Simulation Methods	15.3-15.6
(F) May 9 th	Isotopes in GW	20.1-20.6
(M) May 12 th	Isotopes in GW	20.1-20.6
(W) May 14 th	READING DAY	
(Th) May 15 th	FINAL EXAMS BEGIN	