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.

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

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