Lock Haven University
GEOS 360 – Hydrogeology
Fall 2011

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Homepage: http://www.lhup.edu/mkhalequ (study guides and other useful tips will be posted periodically on the website)
Lecture: M-W-F: 9:05-9:55 am (Ulmer 101) **Lab**: Wed: 2:30-5:20 pm (Ulmer 106)
Textbook: C. W. Fetter, Applied Hydrogeology, 4th edition, 2001, Prentice Hall.

Labs Manual: All labs are developed by me for this class and you will get copies of lab exercises before each lab.

Objective: To gain insight into various components of hydrologic cycle, interdependence of surface water and groundwater, and their interrelation with earth materials. Environmental aspects of hydrology, such as flood analysis, groundwater pollution and remediation will be emphasized. Hands-on exercises and problem solving will be an integral part of the course.

Assignments and Homework: The lecture and lab will be closely tied to each other. Many of the lectures and lab materials will come from sources other than your textbook and lab manual (which will be kept in my office and will be available to you upon request). If you want to do well in this course you will have to attend all classes and labs. The attendance in lecture, labs, and field trips is mandatory. There will be a fair amount of reading and problem-solving exercises assigned each week. The homework for each week will be due on the following week (unless otherwise instructed). You will be expected to read materials for both lecture and lab before coming to class. You *may expect some changes* in the syllabus.
Note: There will be a penalty for late lab assignments at 5% per day and no lab will be accepted after the graded labs are returned to the class.

Keeping Current via Participation: In addition to the lab exercises and exams, each student will be required to explore other resources pertaining to hydrogeologic research via surfing the Internet, reading professional journal articles, and participating in classroom discussions. Please bear in mind that 10% of your grade will come from such active participations. You will be required to submit at least two summaries (each one-page long) of journal articles and/or Internet search on hydrogeologic topics.

Mid-terms and the final exam: You will be responsible for the topics in the textbook that relate to the lecture/lab assignments and the materials presented in the class.

Grading: Three hour exams: 50% (15 % + 15% + 20%)
Lab assignments/field reports: 30%
Written assignments, attendance & participation: 10%
Term Paper (on a pre-approved topic): 10%

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Lecture and Lab Schedule (GEOS 360 – Hydrogeology): Fall'11

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Lecture: M-W-F: 9:05-9:55 am **Lab**: Wed: 2:30-5:20 pm

Week of	Lecture topic	Textbook chap.	Lab Exercise
Aug. 29	Introduction/hydrologic cycle	1	Bells Spring FT*
Sep. 5	**No Classes on 9/5/11 (Labor Day)**		Water Budget*
	Precipitation & Runoff	2	Water Budget
12	Streamflow	2	
	(modified schedule on 10/14/11)		
19	Flood analysis	On reserve	Hydrograph+*
	(alternative assignment for 9/19/11)		
26	Flood control	On reserve	Streamflow FT*
	Hour Exam #1 (9/30/11)		
Oct. 3	Introduction to groundwater (aquifer)	3	Flood Analysis
10	Groundwater flow – Darcy's Law	4	Lecture +Porosity
17	Flow nets	4	Lec+ Permeability
24	Introduction to well theory	5	Hyd. Cond., T, S.
31	Analysis of pumping test data	5	Flownets*
	Hour Exam#2 (11/4/11)		
Nov. 7	Pumping test data (cont'd)	5	Well Theory
14	Field methods and tests	12	Pumping Test**
21	Groundwater quality	9/10	**No Labs**
	No classes on 11/23-11/25/11 (Thanksgiving)		
28	Solute transport	10	Water quality
Dec. 5	Remediation techniques	10	GMS ++
	Groundwater modeling	13	
	Final Exam#3 (12/16/11 at 10:00-11:50 am)		

*Parts of the Water Budget, Watershed labs and the whole of the Stream flow lab will be out in the field and you will need to wear appropriate outfit.
**Part of the labs on Nov. 16 on Pumping Test (AQTESOLV) and Contaminant Transport (CONMIG) software will be in Ulmer 311 (computer lab). Depending on availability of the field facility, part of this lab will meet on following Saturday the 19th of November out in the field (I will let you know the details).
++ We will explore various aspects of the GMS and other software in the computer lab in Ulmer 311.