Meeting times: Monday, Wednesday, Friday, 11:00 - 11:50 111 Bretske Hall

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Text: Fetter, C. W., 2001, *Applied Hydrogeology*, 4th ed. Prentice-Hall, Inc., 598p.
ISBN: 0-13-088239-9

Textbook web page: http://www.appliedhydrogeology.info/

Prerequisites: GEOL 111

Recommended: Mathematics (algebra, trigonometry, concepts of calculus) and introductory physics (concepts of mass, acceleration, force, pressure, etc.)

Hours: 3 credit hours / 3 contact hours

Description: GEOL 445 is a course in hydrology that emphasizes surface drainage systems, causes and controls of flooding, ground-water flow, aquifer tests, and the geologic occurrence of ground water.

TENTATIVE LECTURE SCHEDULE

Date	M	W	F	Topic	Chapter (pages)
Aug	20			Intro. to Geology 445	
		22		Matter, energy, dimesions, S.I. units, etc.	1 (18-21), 3 (66-69)
			24	Water, hydrologic cycle, hydrologic equation	1 (1-11), 2 (24-42)
	27			Hydro. eq., infiltration, runoff, streamflow	2
		29		Streamflow, base-flow recession	2
Sep			31	Base-flow recession (cont'd)	2
	3			**Labor Day, no class**	
		5		Rainfall-runoff relationships	2
			7	Porosity, specific yield, specific retention	3
	10			Darcy's law, hydraulic conductivity, permeability	3
		12		Conductivity and permeability (cont'd)	3
			14	Aquifers, potentiometric surfaces, water table	3
	17			Aquifer compress., characteristics (T, Ss, S, etc.)	3
		19		Aquifer characteristics (cont'd), review	3
			21	**EXAM 1**	**1, 2, 3**
	24			Energy and head	4
		26		Energy and head (cont'd), and Darcy's law	4
			28	Equations of ground- water flow	4
Oct	1			Equations of ground- water flow (cont'd)	4
		3		Gradient of hydraulic head, fluid flow, flow nets	4
			5	Flow nets (cont'd), flow lines in anisotropic media	4
	8			Flow lines (cont'd), flow in an unconfined aquifer	4
		10		Steady flow in an unconfined aquifer (cont'd)	4
			12	Flow in an unconf. aquifer (cont'd)	4
	15			Groundwater flow to wells	5
		17		Computing drawdown	5
			19	Computing drawdown (cont'd)	5
	22			**Fall Break, no class**	
		24		Computing drawdown (cont'd)	5
			26	Computing drawdown (cont'd), review	5
	29			**EXAM 2**	**4, 5 [1-3]**
Nov		31		Determining aquifer param. by pump tests	5
			2	Determining aquifer param. by pump tests (cont'd)	5
	5			Determining aquifer param. by pump tests (cont'd)	5

TENTATIVE LECTURE SCHEDULE (CONT'D)

Date	M	W	F	Topic	Chapter(s)
Nov		7		Determining aquifer param. by pump tests (cont'd)	5
			9	Determining aquifer param. by pump tests (cont'd)	5
	12			Pump tests (cont'd), slug tests	5
		14		Determining aquifer param. by slug tests (cont'd)	5
			16	Regional g-w flow or geol. of ground water) (TBA)	7 (or 8)
	19			Regional g-w flow or geol. of ground water) (TBA)	7 (or 8)
		21		**Thanksgiving holiday, no class**	
			23	**Thanksgiving holiday, no class**	
	26			Regional g-w flow or geol. of ground water) (TBA)	7 (or 8)
		28		Regional g-w flow or geol. of ground water) (TBA)	7 (or 8)
Dec			30	Regional g-w flow or geol. of ground water) (TBA)	7 (or 8)
	3			Review	
			7	**FINAL EXAM** **Friday, December 7, 11:00 am - 1:00 pm**	**5, 7 (or 8)**, [1 - 5]

GRADES AND RELATED MATTERS

The *final numerical grade* for the class will be computed as follows.

20 %	Exam 1 (September 21)	_____ x 0.20	=	_____.
23 %	Exam 2 (October 29)	_____ x 0.23	=	_____.
27 %	Final Exam (Friday, Dec. 7, 11:00 am - 1:00 pm)	_____ x 0.27	=	_____.
20 %	Avg. of 5 to 7 problem sets	_____ x 0.20	=	_____.
10 %	**Attendance** and participation	_____ x 0.10	=	_____.
		TOTAL (Final numerical grade)	=	_____.

The *final letter-grade* for this class will conform to the following scale, based upon the computed *final numerical grade*.

F≤59.9, D=60-69.9, C=70-79.9, B=80-89.9, A=90-100

PROBLEM SETS

Students will be required to complete several problem sets, which will be graded. The average of problem set scores will be considered in the final grade for the class, as described above.

Students are required to show their work for all computations on problem sets.

EXAMS

Exams will be comprehensive, meaning that each exam will cover all material that precedes it. The second and third (final) exams will emphasize the material covered since the previous exam. For example, the second exam will emphasize chapter 4 and the first half of chapter 5, but will also include questions related to chapters 1 through 3.

Exams will require computations similar to those made for the problem sets and may include questions of other formats, including matching, fill in the blank, multiple choice, and short answer (several well-composed sentences, plus diagrams). Students are required to show their work for all computations on exams.

EXAMS (CONT'D)

Make-up exams will be provided in only the most adverse circumstances (e.g. serious illness). Documentation of the circumstance (e.g. doctor's note) may be required.

Arrangements for a make-up exam must be made with the instructor prior to the scheduled time of the regular exam.

In the event that a student is provided with a make-up exam, he or she should anticipate that it is likely to be different from the regular exam.

GRADUATE STUDENTS

Students taking this 400-level class for graduate credit should be registered for GEOL 501, Section 001, Hydrology.

Alternatively, students taking this 400-level class for graduate credit must complete the necessary paperwork with the graduate school at the beginning of the semester.

In this course, graduate students are held to higher standards and greater expectations than undergraduate students and are expected to more perfectly master the content. Hence, there will be two additional means of assessment for graduate students:

1. Each exam will include at least one additional question that requires an essay response and will be valued no less than 15% of the exam grade. An in-depth understanding of important concepts and relationships among them will be required to perform well on these essay questions.

2. Graduate students are expected to research a topic of their choice in the area of physical hydrology and to produce an 8 to 10 page paper. This project will provide graduate students an opportunity to explore and develop their interests in hydrology and will require them to further study applications of course content. This research paper will contribute 10% of a graduate student's final grade in this class; other componants of the final grade will be scaled to total 90%.

BLACKBOARD

Some aspects of this course are available through UTC's online course delivery system (Blackboard), which can be accessed at:

http://utconline.utc.edu

Your user name for logging on to the system is your UTCID (mix of letters and numbers). Your password for Blackboard is the same as your password for your UTC e-mail (Onenet) and for your access to the Lupton Library databases. If you change your password in Blackboard, you also change your password on both of these other systems. If you forget your password, follow the "Forgot Password" links from either the Onenet (http://onenet.utc.edu/) or Blackboard (http://bb2.utc.edu/webapps/login) login pages.

Documentation on student use of Blackboard is available at:

http://utconline.utc.edu/BB6Students.html

EMAIL (firstname-lastname@utc.edu)

To enhance student services, the University will use your UTC email address (firstname-lastname@utc.edu) for communications. (See http://onenet.utc.edu for your exact address.) Please check your UTC email on a regular basis. If you have problems with accessing your email account, contact the Help Desk at 423-425-2676.

OTHER POLICIES

Students are expected to attend class regularly. Attendance and participation will be considered in the final grade. (See *Grades* .)

Students are expected to be punctual, attentive and prepared for class.

Students that arrive late for an exam may not be permitted to take the exam.

Assignments are expected to be turned in on time. Late assignments will be accepted in only the most adverse circumstances (e.g. serious illness or accident). Documentation of the circumstance (e.g. doctor's note) may be required.

All students are expected to follow the UTC honor code.

This syllabus is subject to minor changes.

ATTENTION: If you are a student with a disability and think that you might need special assistance or special accommodation(s) in this class or any other class, call the Office for Students with Disabilities/College Access Program at 425-4006 or come by the office, 110 Frist Hall.