

GEO 346C: Introduction to physical and chemical hydrogeology (26870)

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Class room: JGB 3.116
Class time: Tu/Th 11:00 – 12:30

Class goals:

Introduce students to key physical and chemical concepts of hydrogeology and enable them to quantitatively solve applied problems.

Pre-requisites:

Introductory geology, calculus and inorganic chemistry

Grading

40% homeworks + 25% mid-term exam + 30% final exam + 5% class participation

Required reading:

Applied Hydrogeology, C. W. Fetter, 4th-ed., Prentice-Hall

Week	Date	Topic	Main Topic(s)	Reading in Fetter	Problem Sets
1	Th – 26/08	I 1	Introduction History of Hydrogeology	relax	
2	Tu – 31/08	I 2	Water properties	settle in	hw 1
	Th – 02/09	C 1	Hydrologic cycle	2.1 to 2.8	
3	Tu – 07/09	C 2	Hydrologic cycle		HW1 due
	Th – 09/09	C 3	Stream hydrographs	2.9 to 2.14	hw 2
4	Tu – 14/09	P 1	Porous Media: rock types &	3.1 to 3.3	

			porosity		
	Th – 16/09	P 2	Darcy's experiment: conductivity, permeability	3.4 to 3.5	HW2 due
5	Tu – 21/09	P 3	Heterogeneity & anisotropy	3.11	hw3
	Th – 23/09	P 4	Types of aquifer, compressibility	3.7, 3.9, and 3.10	
6	Tu – 28/09	P 5	Water-table, potenziometric surface maps, gradients	3.8 and 3.12	HW3 due
	Th – 30/09	F 1	Energy & head	4.1 – 4.3	hw4
7	Tu – 05/10	F 2	Force potential & Darcy's law	4.4 – 4.6.3	
	Th – 07/10	F 3	Equations of flow	4.7 – 4.10	HW4 due
8	Tu – 12/10	F 4	Flow lines flow nets	4.11 – 4.12	
	Th – 14/10	F 5	Steady unconfined flow	4.14	
9	Tu – 19/10	E 1	Mid-term exam		
	Th – 21/10	W 1	Well in confined aquifer	5.1 – 5.4.1	hw5
10	Tu – 26/10	W 2	Well in unconfined aquifer	5.4.3	
	Th – 28/10	W 3	Determining aquifer parameters from well tests	5.5 – 5.5.3.2	HW 5 due
11	Tu – 02/11	W 4	More on Wells	5.5.6, 5.9, 5.10	hw 6
	Th – 04/11	Ch 1	Intro aqueous chemistry units, reactions, law of mass action	9.1-9.4	
12	Tu – 09/11	Ch 2	Ionic strength, activity models	9.5 – 9.7	
	Th – 11/11		Carbonate equilibria	9.8 – 9.9	HW 6 due
13	Tu – 16/11	Ch 3	Redox	9.10	hw7
	Th – 18/11	Ch 4	Ion exchange – Piper diagrams		
14	Tu – 23/11	T 1	Solute transport, dispersion	10.6	HW 7 due
	Th – 25/11		Thanks giving holiday		
	Tu – 30/11	T 2	Retardation	10.6.6	
15	Th – 02/12		Final Revision		
16	Fr 10/12 2:00-5:00		Final exam		