Ground Water Geology – GEO 360
Class 8:00 to 8:50 MWF in FSA 438

Instructor: Dr. Eric Peterson
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Office Hours: 9:00 – 9:50 AM MW or by appointment
Course Webpage: ReggieNet and http://geo.illinoisstate.edu/ewpeter/geo360.htm

Purpose of the Course:
1. I want students to be able to understand the concept of hydraulic conductivity and hydraulic head sufficiently in order to construct a water table map and interpret the basic physics of groundwater flow based on a water table map. (BS outcomes 4, 7, 8; MS outcomes 1, 4, 6)
2. I want students to be able to identify, compile, and interpret the necessary hydrogeologic data and apply appropriate hydrogeologic tools and methods (analytical solutions, etc.) to solve an unfamiliar (new) hydrogeologic problem. (BS outcomes 4, 7, 8; MS outcomes 1, 4, 5, 6)
3. I want students to be able to solve problems in hydrogeology and make decisions about hydrogeologic issues that involve uncertainty in data, scant/incomplete data, and the variability of natural materials. (BS outcomes 7, 8, 9; MS outcomes 1, 4, 6, 7, 8)
4. I want students to be able, given a hydrogeologic problem/issue to determine what data are necessary to address the issue, how to acquire and interpret the data, how to recognize likely errors in data collection and interpretation, and how to quantify the uncertainty in the "answer." (BS outcomes 7, 8; MS outcomes 1, 4, 6, 7)

Textbook: Groundwater Science 2nd Ed. by Fitts

Reference Texts: See additional handout for other reference texts.

COURSE POLICIES

Academic Honesty: Any form of academic dishonesty will result in a zero for that exam or assignment, as well as possible disciplinary action. See your student handbook for University guidelines

Participation in Lecture: Students are responsible for all material covered in class, and thus your attendance is expected at all lecture sessions. Repeated unexcused absences will affect your Participation score. Students that have prior knowledge of absences on lecture, exam, or field trip dates owing to religious, athletic, band, or other legitimate ISU sponsored activities should give Dr. Peterson at least one-week prior notice of the absence.
GRADING:

There are three grading mechanisms in this class: examinations (which reflect an individual’s ability to understand the conceptual, mathematical, and practical material), projects (which reflect your ability to work as a team and to integrate concepts from lectures and homework), and homework (which reflects an individual’s ability to handle practical and theoretical calculations and interpret and summarize hydrogeologic data).

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<th>Percentage</th>
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<tbody>
<tr>
<td>Examinations (2)</td>
<td>15%</td>
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<tr>
<td>Final Examination (comprehensive)</td>
<td>20%</td>
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<tr>
<td>Homework &amp; Participation</td>
<td>30%</td>
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<tr>
<td>Projects (2)</td>
<td>35%</td>
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Grading is done via a broken curve. That is, instead of following a normal curve with predetermined grade cut-offs, I look for natural breaks in the final grade distribution. These breaks become the dividing lines between letter grades, but shall under no circumstances result in grade cut-offs higher than the classical 90-80-70-60 levels.

Homework assignments, including problem sets, lab reports, and readings will be given regularly. You will need to stay current in your reading as I will expect that you have read the text. You will have at least one week to complete the assignment. Reading assignments from the text and from journal articles will also be made throughout the semester. In class assignments and/or quizzes over the material will be included in the participation score.

You will be working in groups on the projects. I expect well-written and carefully prepared reports. Your written reports are to be typewritten. Your figures and maps are to be properly labeled and presented appropriately. When the projects are assigned, more detailed information will be provided.

The first exam will be scheduled for late September (maybe early October) and the second exam will be in November. You will want to keep up with the material; what is learned early in the semester will carry forward. You must ask questions as they arise. You must attend class; otherwise, you may miss important announcements. If you are late to an exam, you will NOT be allowed extra time. If you are VERY LATE and another student has already handed in an exam and left the room, you will have to take a make-up exam.

A make-up examination will be given for those people who have missed a mid-term examination for which you have an EXCUSED absence.

**DEADLINES ARE TAKEN SERIOUSLY IN THIS CLASS.** Think of it this way, in the environmental consulting field, companies are penalized (they pay fines) for missing deadlines. You could cost your company thousands of dollars by missing a deadline and may even lose your job. Think of this class as practice. PLAN AHEAD. **Late assignments will be penalized 10% per day the assignment is late.** The date your assignments are due will be given either in the upper right-hand-corner of the assignment or posted clearly on the board. READ IT and HEED IT.
Tentative Schedule:

Week 1: Background and Hydrologic cycle (Chapter 1)
Week 2: Hydrologic Cycle and Water Chemistry (Chapter 2.1 & 2.2 and Chapter 10)
Week 3: Water Chemistry (Chapter 10) and Properties of Porous Media (Section 2.4)
Week 4: Porous Media and Head (Section 2.5)
Week 5: Darcy’s Law (Chapter 3)
Week 6: Hydraulic Conductivity (Chapter 3) & Exam 1 (?? Take Home to replace GSA time)
Week 7: Unsaturated Zone (Chapter 3)
Week 8: Groundwater Flow (Section 5.1)
Week 9: Hydrology/Geology (Chapter 5)
Week 10: Storage (Chapter 6 up to 6.8)
Week 11: Groundwater Flow equation (Section 6.9)
Week 12: GSA and Flow (Chapter 7)
Week 13: Well Hydraulics (Chapter 8)
Week 14: Well Hydraulics and Exam 2 (Tentative)
Week 15: Thanksgiving Break
Week 16: Groundwater Contamination (Chapter 11)