CoSM Class Syllabus / Policy

2020 / Spring
GOL 449.001 & GOL 449.011
Ground Water & Ground Water Lab

Name: Dr. Kevin W. Stafford
Department: Geology
Email: staffordk@sfasu.edu
Phone: 936-468-2429
Office: E.L. Miller Science 315A
Office Hours: MW (8:00-11:00) or by appointment

Class meeting time and place: MW 13:00 – 13:50 : Miller Science 333
Lab meeting time and place: M 14:00 - 16:30 : E.L. Miller Science 333

Text and Materials:

Course Description:
Ground Water (GOL 449) – Three semester hours, two hours lecture, three hours laboratory per week. Principles of occurrence and movement of water beneath the earth's surface and the influence of various geologic situations upon its behavior, depletion, recharge and contamination of ground water supplies.

Program Learning Outcomes:
There are no specific program learning outcomes for this major addressed in this course. It is a general education core curriculum course and / or a service course.

General Education Core Curriculum Objectives/Outcomes:
The objective of Groundwater is to gain an understanding of the physical mechanisms that transport fluids below the surface and the contaminants that influence the integrity of groundwater resources.

Student Learning Outcomes:
The student is expected to understand and apply the following concepts of groundwater:

1. Review the basic principles of the hydrologic cycle and ground and surface water flow.
2. Understand ground water quality, basic water chemistry, solute transport and attenuation.
3. Define and characterize saturated and vadose zone flow systems.
4. Discuss the hydraulic properties of fluids and earth materials.
5. Understand groundwater contaminant transport and geochemistry.

Course Requirements:
Ground Water (GOL 449) is designed to provide an overview of the principles of occurrence and movement of water beneath the earth's surface and the influence of various geologic situations upon its behavior, depletion, recharge and contamination of ground water supplies. The course is divided into a lecture section and a lab section. See section on Grading Policy below.

Student learning in the lecture section will be evaluated through three examinations, laboratory exercises and student projects (Aquifer Project):
- **Midterm** (Wednesday, 04 Mar 20) – Exam focuses on general characteristics and quantification of groundwater, including all lecture material covered in class since beginning of semester. Midterm will count 20% of semester grade.
• **Final** (TBA) – Exam focuses on aqueous geochemistry and geologic occurrences of groundwater, including all lecture material covered throughout the semester. Final will count 20% semester grade.

• **Reading Quizzes** (Weekly) – Students will complete weekly reading assignments related to classroom lecture materials and be assessed during a weekly quiz to ensure comprehension of topics. Reading quizzes will be averaged for 10% of the total semester grade.

• **Laboratory Exercises** (Weekly) – Students will complete a weekly lab assignment related to the laboratory exercise conducted that week. Assignments may vary from mathematical calculations to figure construction to complete lab reports. Some labs will be multi-week and grade for lab assignment will correlate with the number of weeks for those specific labs. Lab portion of grade will be averaged for 40% of semester grade.

• **Aquifer Project** (Monday, 27 April 20) – Each individual student will prepare and deliver a 15 minute presentation that provides an overview of one of the major aquifer systems in Texas. Individual aquifers will be assigned to students early in the semester. Grades will be calculated on detail of subject and presentation style. Project will count 10% of semester grade.

**Lecture Course Calendar:**
Tentative schedule of topics to be covered in GOL 449 lecture include:

*Note: associated reading for each lecture is in parentheses*

- 15 Jan 20 – Introduction to Course (read Ch. 1)
- 20 Jan 20 – MLK Holiday – No Class
- 22 Jan 20 – Water Cycle
- 27 Jan 20 – Water Flux (read Ch. 2)
- 29 Jan 20 – Properties of Water
- 03 Feb 20 – Properties of Porous Media (read Ch. 3.1 to 3.6)
- 05 Feb 20 – Darcy’s Law
- 10 Feb 20 – Limitations of Darcy’s Law (read Ch. 3.7 to 3.12)
- 12 Feb 20 – Transmissivity
- 17 Feb 20 – Variable Density Fluid (read Ch. 4, 5.1)
- 19 Feb 20 – Wells
- 24 Feb 20 – Patterns of Groundwater Flow (read Ch. 5.2 to 5.7)
- 26 Feb 20 – Surface Hydrogeology
- 02 Mar 20 – Hydrogeology and Geology (prepare for Midterm Exam)
- 04 Mar 20 – **Midterm Exam** (read Ch. 6)
- 09 Mar 20 – Spring Break
- 11 Mar 20 – Spring Break
- 16 Mar 20 – Graduate Fieldwork – Class Cancelled
- 18 Mar 20 – Graduate Fieldwork – Class Cancelled
- 23Mar 20 – Effective Stress and Pressure
- 25 Mar 20 – Consolidation and Elastic Storage (read Ch. 7)
- 30 Mar 20 – Isotropic Flow Nets
- 01 Apr 20 – Anisotropic Flow Nets (read Ch. 8)
- 06 Apr 20 – Slug Tests
- 08 Apr 20 – Pump Tests (read Ch. 11)
- 13 Apr 20 – Contamination Sources
- 15 Apr 20 – Solute Transport (read Ch. 12)
- 20 Apr 20 – Heat Flow
- 22 Apr 20 – Geothermal Gradients
- 27 Apr 20 – Project Presentations
- 29 Apr 20 – Review for Final Exam
- TBA – **Final Exam**
Lab Course Calendar:
Tentative schedule of topics to be covered in GOL 449 lab include:

Note: No specific reading assignments for lab

- 20 Jan 20 – MLK Holiday – No Class
- 27 Jan 20 – Phase Transitions (classroom activity)
- 03 Feb 20 – Porosity / Permeability (classroom activity)
- 10 Feb 20 – Darcy Experiment (classroom activity)
- 17 Feb 20 – Well Characterization (off campus / outdoor activity)
- 24 Feb 20 – Water Table Map (classroom activity)
- 02 Mar 20 – Surface Flow Quantification (classroom activity)
- 09 Mar 20 – Spring Break
- 16 Mar 20 – Graduate Fieldwork – Class Cancelled
- 23Mar 20 – Pore Pressure Quantification (classroom activity)
- 30 Mar 20 – Flow Nets (classroom activity)
- 06 Apr 20 – Slug Testing (off campus / outdoor activity)
- 13 Apr 20 – Well Site Assessment (off campus / outdoor activity)
- 20 Apr 20 – Well Testing Data Analyses (classroom activity)
- 27 Apr 20 – Project Presentations

Grading Policy:

- Lecture exams will count 40% (20% for each individual exam) of total semester grade.
- Weekly quizzes will count 10% of total semester grade.
- Lab Assignments will count 40% of total semester grade.
- Aquifer project presentation will count 10% of total semester grade.
- Total points: 40% (Lecture Exams) + Weekly Quizzes (10%) + 40% (Lab Assignments) + 10% (Aquifer Project) = 100%
- Grade Scale: >90% = A ; 80-89.9% = B ; 70-79.9% = C ; 60-69.9% = D ; <60% = F

Exams may include any of the following types of questions: 1) multiple choice questions; 2) true / false questions; 3) fill in the blank questions; 4) short answer questions; 5) figure illustration; 6) short essay questions; 7) mathematical calculations. All exams will take place in room 332 unless otherwise stated in class.

Cell phones, calculators, and other electronic devices are NOT permitted during exams. If you are using them in an exam, it will be assumed that you are cheating and you will receive a grade of “0” on that exam.

Exam scheduling conflicts for officially sanctioned university reason will be accommodated at a different time or date. In the event of such conflicts, you must inform me at least one week prior to the exam to reschedule your exam. Make-up exams are only given in documented cases of official university activities, illnesses or deaths in the family. If the final is missed for a legitimate excuse, an “Incomplete” will be given at the final and a make-up exam can be taken at the beginning of the next semester. Make-up exams will be different than the regular class exam and may be entirely essay format.

Attendance Policy:

- Daily attendance will be taken for university accounting purposes. Success in this course will reflect the level effort you put into the course.
- Be prepared for lectures by reading the material to be covered in lecture prior to attending class. Questions are encouraged and welcome – do not hesitate to ask questions in class.
- No electronic devices are needed during lectures for this class, including cell phones and calculators. Please turn them off and do not use them in class. Ringing phones and beeping electronics disturb others in the class and interrupt lectures. If you interrupt class with your personal electronic devices, you will be asked to leave for the day.
• If you are late to class, please seat yourself quietly. Try not to be late because it interrupts others in the class. If you need to use the restroom or become ill, please excuse yourself from the lecture quietly.

• If you need to study for another class, do it elsewhere. The classroom is not the place to sleep either. Basically, refrain from activities in lectures that will distract or disturb the other students in the room, because you are all paying for the class and most people want to get what they are paying for.

Academic Integrity (A-9.1)
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

Withheld Grades Semester Grades Policy (A-54)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

Students with Disabilities
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.