GEO 325 Groundwater Hydrology

Summer 2023

Course Credits: 4
Contact Hours: 55 hours
Instructor: TBA
Email:TBA

COURSE OBJECTIVES

The course delves into the principles and concepts of groundwater science. Students will gain a thorough understanding of the dynamics of subsurface water flow and the transport of substances within aquifers. Emphasis is placed on the crucial role of groundwater in the overall hydrologic cycle, as well as its interactions with geological structures. Additionally, the course explores the management strategies employed to address the challenges associated with contaminated groundwater. Throughout the course, students will engage in theoretical discussions, assignments, and labs to develop a comprehensive understanding of hydrogeology and its applications in real-world scenarios.

Upon Completion of this Course, students will be able to:

1. Understand the role of groundwater within the hydrological cycle and its significance as a natural resource
2. Gain knowledge about the physical processes and mechanisms governing water movement in geological materials
3. Explore the factors that affect drinking water quality and the potential sources of contamination
4. Study various methods and techniques used for remediating contaminated groundwater
5. Learn about the importance of groundwater monitoring in ensuring the safety and sustainability of water supplies

PREREQUISITES

N/A

GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS
Labs	40 Points
Quizzes	10 Points
Midterm	20 Points
Final Exam	30 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

A ≥ 90 > B ≥ 80 > C ≥ 70 > D ≥ 60 > F.

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

C. W. Fetter; David Kreamer, ***Applied Hydrogeology***, 5th Edition, Waveland Press, 2022.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS

Module 1	**Topics:** Topic 1: Course Overview Topic 2: Hydrology and Hydrogeology Topic 3: Elements of the Hydrologic Cycle Topic 4: Properties of Aquifers **Assessments:** Quiz#1
Module 2	**Topics:** Topic 5: Principles of Groundwater Flow Topic 6: Mechanical Energy & Hydraulic Head Topic 7: Force Potential and Hydraulic Head Topic 8: Groundwater Flow to Wells **Assessments:** Lab#1: Permeability Experiment Midterm
Module 3	**Topics:** Topic 9: Soil Moisture and Groundwater Recharge Topic 10: Regional Groundwater Flow Topic 11: Geology of Groundwater Occurrence Topic 12: Water Chemistry **Assessments:** Lab#2: Groundwater Flow Simulation Experiment Quiz#2
Module 4	**Topics:** Topic 13: Water Quality & Groundwater Contamination Topic 14: Water Quality & Groundwater Contamination (Cont.) Topic 15: Groundwater Development and Management Topic 16: Ground Water Monitoring **Assessments:** Lab#3: Contaminant Transport Experiment
Module 5	**Topics:** Topic 17: Ground Water: Resource mapping and exploitation Topic 18: Field Methods Topic 19: Groundwater Models Topic 20: Final Exam Reviews **Assessments:** Lab#4: Groundwater Remediation Experiment Final Exam

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

1) Late assignments are not acceptable and are subjected to grade deductions.
2) Assignments submitted in the wrong format will be counted as not submitted.
3) Failure to submit or fulfill any required course component results in failure of the class.
4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACEDEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.