



蘇州大學
Soochow University

GEO 450 Physical Hydrogeology

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course provides a comprehensive introduction of physical hydrogeology which combines a qualitative, conceptual understanding of hydrologic processes. Topics include basic concepts of hydrogeology, principles and process of hydrologic cycle, ground-water, soil-water, flow equations, water balance, the streamflow, water-resource management, physical quantities and etc. Students are expected to gain knowledge to analyze the process and mechanism of water movement after studying in this course.

Upon completion of this course, students will be able to:

1. Acquire a basic understanding of physical hydrological processes;
2. Describe and represent major components of the hydrologic cycle and discuss how these components interact;
3. Describe characteristics of groundwater flow including groundwater and soil water;
4. Answer scientific and water-resources-management questions;
5. Gain basic skills for labs of physical hydrogeology and illustrate the principles and applications.

PREREQUISITES

ERTH 401 Introduction to Planet Earth; MATH 263 Calculus for Life Science II

GRADING

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

ITEM

POINTS



2 Labs	30 Points
2 Assignments	20 Points
Midterm Exam	25 Points
Final Exam	25 Points
Total	100 Points

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

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

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

COURSE MATERIALS

Required Texts:

1. Physical Hydrology by S. Lawrence Dingman, 3rd Edition, Waveland Press, Inc., 2014.
2. Hydrogeology by Bernward Hölting Wilhelm G. Coldewey, 8th Edition, Springer, 2019.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	<p>Topics: Topic 1: Introduction Topic 2: Hydrology: Basic Concepts and Challenges Topic 3: The Global Context: Climate, Hydrology, and the Critical Zone Topic 4: Principles and Processes</p> <p>Assessments: Assignment # 1</p>
Module 2	<p>Topics: Topic 5: Pressure-Temperature-Density Relations Topic 6: Water Vapor Topic 7: The Evaporation Process Topic 8: The Precipitation Process</p> <p>Assessments:</p>



	Lab # 1 Subsurface Flow
Module 3	Topics: Topic 9: Turbulent Exchange of Momentum, Mass, and Energy Topic 10: Precipitation Topic 11: Snow and Snowmelt Topic 12: Evapotranspiration Assessments: Midterm Exam
Module 4	Topics: Topic 13: Principles of Subsurface Flow Topic 14: Water Conditions in Soils Topic 15: The Infiltration Process Topic 16: Quantitative Modeling of Infiltration at a Point Assessments: Assignment # 2
Module 5	Topics: Topic 17: Redistribution of Soil Water Topic 18: Ground Water in the Hydrologic Cycle Topic 19: Ground Water in the Regional Water Balance Topic 20: Runoff Generation and Streamflow Assessments: Lab # 2 Infiltration 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 (e.g., note taking, reading course documents).

ACADEMIC 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:



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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.