

Introduction to Hydrology
PGEOG 33200 / 70152
Spring 2022 Syllabus V2

Note – this syllabus is subject to change

Instructor: Allan Frei, afrei@hunter.cuny.edu

Office Hours: by appointment

Course Times: Monday, Wednesday 4:10-5:25

Mode of Instruction: in person,

Meeting room (Note 2 different rooms): 1090B1 North Bldg. (Mondays) and 1022 North Bldg. (Wednesdays)

Course Overview

One definition of hydrology reads: a branch of earth sciences focused the movement, distribution, chemistry, biology, and quality of water on Earth; can be applied to problems of water resources management and/or environmental sustainability (adapted from Wikipedia, https://en.wikipedia.org/wiki/Outline_of_hydrology). Hydrological processes are critical for our natural environment, and provide water for people. In this course we learn the basics of hydrology from a geographic, as opposed to engineering, perspective. This means that we consider the explanation of processes, and broader interdisciplinary issues, as important as the technological approach to solving problems.

The course includes four sections. While each section focuses on a different aspect of hydrology, there is considerable overlap as well.

1. **Physical Hydrology:** The basic underpinning of all the other sections, physical hydrology addresses the movement and distribution of water across our planet. Approximately half the course is devoted to physical hydrology.
2. **Quantitative Hydrology:** This section focuses on the quantitative techniques widely employed to understand our planet's hydrology. (Approximately two weeks).
3. **Water Quality:** This section focuses on key chemical and biological processes and indicators associated with water quality. (Approximately two weeks).
4. **Water Management / Human Impact:** In the final section of this course, we consider how humans have purposely as well as inadvertently affected hydrological processes across our planet, and we consider the great challenges for hydrological sciences during the twenty first century associated with human impacts. (Approximately two weeks).

Prerequisites

The prerequisite for this course are PGEOG13000 (Weather and Climate), or permission of the instructor. However, for undergraduates any introductory level earth science course will be accepted. For graduate students, a reasonable interest is the main prerequisite.

Expected Learning Outcomes: After completing this course, you should be able to:

1. Describe the processes associated with the major components of the water cycle, and with water quality, at different spatial scales.
2. Describe some of the basic techniques in measuring and/or estimating components of the water cycle.
3. Describe and implement some of the common quantitative techniques for analyzing hydrological variations.
4. Describe the major ways that humans affect hydrological processes at different spatial scales, and how these relate to the challenges facing hydrological sciences in the twenty first century.

Mode of Instruction

This course will be taught **in person**. A variety of in-person modes of instruction will be implemented, including traditional lectures by the professor, presentations by students, and in-class exercises. **We meet in the Department of Geography and Environmental Science computer lab on Mondays, and a lecture room on Wednesdays.**

Textbook. There is no required cost for text books for this course. We are using the second edition of Davie's Fundamentals of Hydrology which is currently out of print. Instructions of obtaining, at no charge, the pdf version of the text book are provided on blackboard. If a student wants hard copy, it is available on line for under \$25. Other resources will be made available to the student through either blackboard or the Hunter College library.

Davie, T. (2008). *Fundamentals of Hydrology* (2nd ed.). Routledge.
<https://doi.org/10.4324/9780203933664> (out of print)

Software. There is no required cost for software for this course.

It is expected that students have familiarity with EXCEL. Other publicly available on-line software will be used. Instruction will be provided for all activities.

Evaluation. *The details of number of assignments, exams, and presentations, as well as their weight in the final grade, are subject to minor changes.*

Final grades are based on the following:

- Six assignments (60%)
- Two exams (20%)
- Two in-class presentations (20%)

No extra credit assignments are given, and late assignments are not accepted. All assignments are weighted in proportion to the work required. Graduate students will have additional assignments and presentations.

Communication between the student and professor. The major mode of communication outside of the classroom is email. The professor will use *only the email associated with the student's blackboard account.*

To communicate with the professor: All email messages about this course should go to afrei@hunter.cuny.edu, and should be signed with your full name as it appears on blackboard or CUNYFirst. I try to respond promptly, but please do not hesitate to contact me again if I do not respond to your email within two days, or sooner if you need more urgent attention!

Blackboard

Most material provided to students, and material submitted by students, will be through Blackboard. You will access homework assignments, check grades, and upload your assignments, through Blackboard. Other material may be available on line.

Grading Policy

All grading for this course will follow the CUNY grading policy, which can be found: <http://catalog.hunter.cuny.edu/content.php?catoid=15&navoid=1433>.

Pass/No Credit Option for *undergraduates only*:

You have the option to request a grade of Pass/No Credit for this course. To receive this grade, you must submit the request for a Pass/No Credit grade by completing the form linked to the registrar's website (<https://hunter.cuny.edu/students/registration/register-for-classes/credit-no-credit/#instructions>). The form must be submitted by 11:59 pm the day before the last day of classes. The decision is irrevocable. In order to qualify for a Pass/No Credit grade, you must complete all the requirements for the course, including attendance, assignments, exams, and the final exam/project. To Pass, you must earn at least a D. If you stop attending, stop submitting assignments, and/or do not take the final exam, you receive a grade of WU (Unofficial Withdrawal), which cannot be converted to Pass/No Credit, and may affect your financial aid status.

Class Environment

To ensure that all class members feel welcomed and equally able to contribute to class discussions, we will all endeavor to be respectful in our language, our examples, and the manner in which we conduct our discussions and group work. If you have any concerns about the environment of the class, please contact the professor.

Syllabus Changes

This syllabus and schedule are guides for the course and are subject to change without advance notice. All changes will be announced on Blackboard, by email, and/or in class.

Hunter College Policy on Academic Integrity:

Hunter College regards acts of academic dishonesty (e.g. plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

Hunter College's Policy on Sexual Harassment:

In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

- a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline ([646-610-7272](tel:646-610-7272)) or their local police precinct, or contacting the College's Public Safety Office ([212-772-4444](tel:212-772-4444)).
- b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or [212-650-3262](tel:212-650-3262)) or Colleen Barry (colleen.barry@hunter.cuny.edu or [212-772-4534](tel:212-772-4534)) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

Hunter College's Policy on Students with Disabilities:

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/ or Learning) consult the Office of AccessABILITY located in Room E1124 to secure necessary academic accommodations. For further information and assistance please call (212-772-4857)/TTY (212-650-3230).

Tentative Schedule (This Schedule is Subject to Change)

Mondays meet in room 1090B1 North Building

Wednesdays meet in room 1022 North Building

Class number	Section of course	Date	Day	Topic	Assignment due dates, exams, presentations
1	Physical Hydrology	1/31	M	Introduction to hydrology, water, and the hydrologic cycle (Ch. 1)	
2		2/2	W		Read Ch. 1
3		2/7	M	Precipitation (Ch. 2)	Read Ch. 2 Assignment 1. Ch. 1
4		2/9	W		
5		2/14	M	In-class exercise	Assignment 2. Ch. 2
6		2/16	W	Evaporation (Ch. 3)	Read Ch. 3
		2/21	M	NO CLASS, COLLEGE CLOSED	
7		2/23	W		
8		2/28	M	In-class exercise	
9		3/2	W	Storage and Groundwater (Ch. 4)	Read Ch. 4
10		3/7	M	Runoff (Ch. 5)	Read Ch. 5
11		3/9	W		Assignment 3 (Ch. 3 & 4)
12		3/14	M	Urban Hydrology	Grad student presentation
13		3/16	W	<ul style="list-style-type: none"> • Drought (not in text) • Review for midterm 	
14		3/21	M	In-class exercise	Assignment 4. Ch. 5
15		3/23	W	Exam 1. Chapters 1-5	

Class number	Section of course	Date	Day	Topic	Assignment due dates, exams, presentations
16	Quantitative Hydrology	3/28	M	Streamflow analysis and modeling (Ch. 6) In-class exercise	Read Ch. 6
17		3/30	W	Computer modeling in Hydrology	
18		4/4	M	In-class exercise	
19		4/6	W	Article discussion	Read assigned article, undergrad presentations
20		4/11	M	In-class exercise	
21	Water Quality	4/13	W	Water Quality (Ch. 7)	<ul style="list-style-type: none"> • Assignment 5. Ch. 6 • Proposals for presentation topics
22		4/18	M		Read Ch. 7
		4/20	W	NO CLASS, COLLEGE CLOSED	
		4/25	M	NO CLASS, COLLEGE CLOSED	
23		4/27	W		
24	Water Management / Human Impact	5/2	M	Water Management, Urban Hydrology and water quality (Ch. 8)	Read Ch. 8 Grad student presentation
25		5/4	W		Assignment 6. Ch. 7
26		5/9	M		
27	Student Presentations	5/11	W		Student presentations
28		5/16	M		Student presentations
Finals Week					