

GGR 206 H1F Introduction to Hydrology, 2014 summer

Course Syllabus

Department of Geography, University of Toronto

Instructor: Rong Wang (wangr@geog.utoronto.ca)

Lectures: 6pm-8pm, Tuesdays and Thursday, SS 2127

Office hours: 3pm-5pm, Mondays & Fridays, SS 5060 or by appointment

TA: David Richardson (dave.b.richardson@gmail.com)

Tutorials: 1 hour, Thursdays. You may choose to attend one of the following sessions:

3:00pm (SS 1080)

4:00pm (SS 1080)

5:00pm (SS 2128)

Description

Water is one of the most precious resources to human beings. Hydrology is the study of the occurrence, distribution and circulation of the waters on the planet. Hydrology also deals with the chemical and physical properties of water and its interactions with the environment. We will examine major hydrological processes, including precipitation, evapotranspiration, rainfall interception, soil water, ground water and runoff. Concepts and underlying physics will be introduced in lectures. Assignments will be focused on hydrological analysis in order to help students understand concepts learnt in class. After the class, the students are expected to gain an understanding of global hydrological cycle, to be able to explain fundamental mechanisms behind it and to conduct basic hydrological analysis.

Recommended preparation

It is recommended for students to have previously completed GGR101 and MAT135. Understanding of basic physics such as gravity and Newton's laws will help to understand hydrological processes. Since hydrology is a quantitative science, basic math such as algebra and unit conversions will be required for hydrological analyses. The ability to think in terms of rates of change is essential. Logarithmic functions will be the most complex functions used in this course. Calculus is not required. A handout will be provided in the first class for your self-assessment. After reviewing that, you may have an idea of what you need to work on to achieve the learning goals in this course.

Textbook

- Ward, R.C. and M. Robinson, 2000, Principles of Hydrology. 4th edition. McGraw-Hill, ISBN 0077095022.
- A small number of copies will be available in a couple of days at U of T bookstore. The textbook and other relevant reference books will be reserved in Robarts Library.
- Davie, T., 2008, Fundamentals of hydrology, New York: Routledge, 2008. The electronic link of this book in U of T libraries: <http://go.utlib.ca/cat/8766840>

Evaluation

- Four assignments: $10\% \times 4 = 40\%$
- Midterm test: 20%
- Final exam: 40%

Assignments and Tutorials

- You will need to finish **four** assignments in this course. The assignments are designed to acquaint you with hydrological data analysis and calculation. The topics are:
 - Assignment 1, Precipitation
 - Assignment 2, Evapotranspiration
 - Assignment 3, Rainfall interception and soil water
 - Assignment 4, Runoff
- For each assignment, a **1-hour tutorial** will be conducted by your TA to help you to finish the problem sets, starting on the second week of the class. Attendance is not mandatory. But if you choose to come, it is strongly recommended that you have reviewed the assignment questions in advance. Your TA will not answer point-blank questions on specific questions in assignments.
- Assignment 1, 2 and 3 are **due at the beginning of each tutorial** and should be submitted to your TA in hard copies, and marked assignments will be returned in tutorials. No assignments through email will be accepted. No cover is needed. In addition to your final answers, please also include your intermediate calculation processes in your responses in your assignments. Instructions for submitting Assignment 4 are provided on below the class schedule.
- There will be 5% of **late penalty** per day, excluding weekends and holidays. No assignments will be accepted more than 7 days after the due day. Late assignments can be submitted directly to the TA/instructor or to SS5047, the main office of Department of Geography. Note the drop box for assignment submission is available only during regular business hours (and the main office closes at 5pm sharp!)

In case of illness or injury

To request for assignment deadline extensions or rewriting the test, you need to have licensed practitioner fill out the official university form “Verification of student illness or injury” (The form can be downloaded in the following link: <http://www.healthservice.utoronto.ca/Forms.htm>). Please consult your college registrar if you have difficulties that prevent you from completing your course work.

Getting help

- All the office hours and emails will be handled by your instructor, not your TA. You may make an appointment if you cannot make any of the time slots.
- TA will only help you with your assignments in tutorials.
- Emails are preferred through your utoronto mailbox and use the heading GGR206. They will be answered within 2 business days. Please state your questions with clear and concise words so that you can get appropriate responses in the shortest time.

Blackboard

- Important course announcements
- Key documents such as course syllabus and selected lecture slides
- Marks

Accessibility

U of T provides services on academic accommodations and any accessibility concerns. You may visit the Accessibility Services website: <http://www.accessibility.utoronto.ca/Home/About-Us.htm> for more information. Please feel free to approach me and I will be happy to work with them to help you.

Academic integrity

Plagiarism, cheating on tests and exams, providing false medical documentation and improper collaboration on marked work are serious academic offences and will not be tolerated. More detailed information on U of T Code of Behaviour on Academic Matters can be found here:

<http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun011995.pdf>

Before the start of the class

This is a summer course with very tight schedule. We will cover all the fundamental elements in hydrology and a large number of concepts need to be understood in only six weeks, leaving very limited time for you to “digest”. So please:

- Preview the course materials before the class.
- Attend the lectures.
- Complete the assignments and understand the physical mechanisms behind the questions.
- And most importantly, ASK questions whenever you are stuck.

I hope every one of you enjoy the course, enjoy the summer!

Lecture Schedule

Week	Date	Topic	Readings	Assignment*	Due
1	May 13	The hydrological cycle and system (1)	WR 1.1-1.3		
	15	The hydrological cycle and system (2) Precipitation processes	WR 1.1-1.3 WR 2.1-2.1.1		
2	20	Precipitation-clouds Precipitation measurements	WR 2.1.2-2.2.3		
	22	Precipitation analysis Evaporation processes	WR 2.6 WR 4.1-4.2	1	
3	27	Transpiration processes Evaporations estimation and measurements	WR 4.4.3-4.4.4 WR 4.6.1-4.6.2		
	29	Mid-term test Interception processes and estimation	WR 3.1-3.4, 3.6	2	1
4	June 03	Soil water (soil properties) Soil water movement (1)	WR 6.1-6.3.2 WR 6.3.3-6.3.5		
	05	Soil water movement (2) Soil water measurement	WR 6.4 WR 6.3.6	3	2
5	June 10	Ground water (storage) Ground water movement (1)	WR 5.1-5.4.1 WR 5.5-5.5.2		
	12	Ground water movement (2) Runoff (sources and processes)	WR 5.5.3 WR 7.1-7.3.4	4	3
6	17	Runoff (event-based) Runoff (temporal variations)	WR 7.4.1-7.4.2 WR 7.4.4-7.7		
	19	Runoff(spatial variations) Conclusion and review			
7	23-27	Final Exam (one day in this week)			

* Note: Assignment 1, 2 and 3 are due at the beginning of your tutorial section. Assignment 4 is due by 5pm on Friday, June 20. It should be handed in to the drop box in SS5047, Geography main office. The main office is open regular business hours, Monday-Friday. It closes at 5pm sharp so do not wait until the last minute to arrive.

Two important dates:

- *May 19, last day to add and change courses.*
- *June 9, last day to drop courses.*