

GGR206 H1S – INTRODUCTION TO HYDROLOGY

Winter, 2015

Department of Geography, University of Toronto

CONTACT INFORMATION

Instructor: Ting Zheng (zhengt@geog.utoronto.ca)

Lectures: Tuesday, 1 PM - 3 PM. ES B149

Office hour:

Wednesday: 3 PM – 5 PM.

Office location: SS 5060

TAs:

Rong Wang (wangr@geog.utoronto.ca)

Arnab Chakraborty (arnab.chakraborty@mail.utoronto.ca)

Remi Luo (xiangzhong.luo@mail.utoronto.ca)

Tutorials: 1 hour.

Choose one of the following sessions in ROSI:

Tuesday 3PM, SS 620

Wednesday 2PM, RW142

Wednesday 5PM, SS 620

COURSE INFORMATION

What

What is hydrology? The word ‘hydrology’ comes from Greek where ‘hydro’ means water and ‘logy’ means study. 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.

Who

Should I take this course? If you are interested in this subject, have some background in basic math and physics, the answer is a big YES! If you have previously completed **GGR100** and **MAT135**, then congratulations! You will find the course easy to comprehend. If you haven't, the checklist below will help you identify if this is the right course for you.

You need to have knowledge in:

- ✓ Mass, pressure, force, and Newton's laws (You may want to review what you learned in high school. Supporting materials will be posted on BlackBoard, please make good use of them to help refreshing your memory.)
- ✓ Algebra (Logarithmic functions will be the most complex functions in this course)
- ✓ Unit conversions

How

There is no easy way to get a good mark. Please be responsible for your own learning. Achieving the following will help:

- ✓ 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. Don't be shy!

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>

COURSE ASSIGNMENTS

Assignment 1	Precipitation	10%
Assignment 2	Evapotranspiration	10%
Mid-term		15%
Assignment 3	Rainfall interception and soil water	10%
Assignment 4	Hydrology Report	15%
Final Exam		40%

Tutorial

For each assignment, a 1-hour tutorial will be conducted by your TA to help you to finish the problem sets, starting on the third week of the class. Attendance is not mandatory but strongly recommended. If you choose to come, please make sure you have reviewed the assignment questions in advance. Your TA will not answer point-blank questions on specific questions in assignments.

Hand in

Assignment 1, 2 and 3 are due **at the beginning** of each tutorial and should be submitted to your TA in hard copies. Marked assignments will be returned in tutorials. Assignment 4 is due by 2pm on Thursday, April 02. . It can be submitted to me in lecture on March 31 if completed, or otherwise handed in to the drop box in SS5047, Geography main office. The main office will stamp assignments received before the early closing time that day. Assignments through emails will **NOT** be accepted. In addition to your final answers, please also include your intermediate calculation processes in your responses in your assignments.

Late penalty

There will be 10% of late penalty per day, excluding weekends and holidays. No assignments will be accepted more than 5 business 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 that assignments submitted to the drop box are time stamped at the end of the day (normally 5pm, except the day before long weekends), so you should plan to get anything late in before that time.

OTHER POLICIES

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.

Blackboard

Important course announcements, key documents such as course syllabus and selected lecture slides, and marks will be posted on Blackboard. Make sure to check this site regularly.

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>

COURSE OUTLINE

Date	Lecture Subject	Assignments	Readings
Jan 06	Administration and Introduction Hydrological cycle and system (1)		WR 1.1-1.3
Jan 13	Hydrological cycle and system (2) Precipitation processes		WR 1.1-1.3 WR 2.1-2.1.1
Jan 20	Precipitation-clouds Precipitation measurements		WR 2.1.2-2.2.3
Jan 20/21	Assignment #1 tutorial	A#1,10%	
Jan 27	Precipitation analysis Evaporation processes		WR 2.6 WR 4.1-4.2
Feb 03	Transpiration processes Evaporation estimation Evaporation measurements		WR 4.4.3-4.4.4 WR 4.6.1-4.6.2
Feb 03/04	Assignment #2 tutorial	A#2, 10%. A#1 DUE	
Feb 10	Interception processes Interception estimation Soil water (soil properties)		WR 3.1-3.4 WR 3.6 WR 6.1-6.3.2
Feb 17-20	Reading Week		
Feb 24	Mid-term test Soil water movement (I)	Mid-term, 15%	WR 6.3.3-6.3.5
Mar 03	Soil water movement (II) Soil water measurement		WR 6.4 (up to Eq. 6.3) WR 6.3.6
Mar 03/04	Assignment #3 tutorial	A#3, 10%. A#2 DUE	
Mar 10	Runoff (sources and processes) Runoff (event-based)		WR 7.1-7.3.4 WR 7.4.1-7.4.2
Mar 17	Runoff (temporal variations) Ground water (storage)		WR 7.4.4-7.7 WR 5.1-5.4.1
Mar 17/18	Assignment #4 tutorial	A#4, 15%. A#3 DUE	
Mar 24	Ground water movement (I) Ground water movement (II)		WR 5.5-5.5.2 WR 5.5.3
Mar 31	Runoff (spatial variations) Conclusion and review		WR 7.4.4-7.7
April 02		A#4 DUE	
		Final exam, 40%	