

GGR 206Introduction to Hydrology

Instructor:Jing M. Chen
Office:SS5058, 100 St. George Street
Telephone:416-978-7085
E-Mail:chenj@geog.utoronto.ca

Teaching Assistant Larissa Sage
Office: ES2025
E-Mail: Larissa.sage@mail.utoronto.ca

Lectures

Tuesday 1-3 pm, SS2106

Four tutorials are given on Wednesday 12-2 pm, or Wednesday 3-5 pm, SS620, on 30 September, 14 October, 28 October and 25 November. The pre-exam tutorial will be held at 5-7 pm on 11 December in SS620.

Consultations

Jing Chen: 1-3 pm, Wednesday, SS5058, 100 St. George Street,
Larissa Sage: 4-5 pm, Thursday, ES2025, 33 Willcocks Street.

Recommended Preparation

GGR101Y or JGF150Y or JGG150Y; MAT135Y

(Preparation can be discussed with instructor individually.)

Outline

“Hydrology is the science dealing with the waters of the earth, their occurrence, distribution and circulation, their chemical and physical properties and their interaction with the environment”. This course encompasses major hydrological processes, including precipitation, evaporation, transpiration, rainfall interception, soil water, ground water, and runoff. The emphasis of this course will be on the basic principles of these physical processes forming the complete hydrological cycle at global, regional and watershed scales. A series of 4 assignments are given for students to gain practical skills in hydrological analysis.

Evaluation

4 assignments _____ 40%

Mid-term exam _____ 20%

Final exam _____ 40%

Late assignment reports will be penalized at 10% of the portion of the lab for each day of delay, i.e., a multiplying factor of 0.9 will be used for 1-day delay, and 0.8 for 2-day delay, etc.

Text Book

Ward, R. C. Ward and M. Robinson, 2000, *Principles of Hydrology*. 4th Edition. McGraw-Hill. ISBN 0077095022. (Available in the U of T bookstore)

Other References

Jones, J. A. A., 1997. *Global Hydrology: Processes, Resources and Environmental Management*. Longman. (A copy of relevant chapters is available at departmental office. Contact Donna Jeynes)

Lecture, Assignment and Tutorial Schedule

Date	Lecture Subject	Assignments	Readings
Sep 15	Administration and Introduction Global hydrological cycle (1)		WR 1.1-1.3
Sep 22	Global hydrological cycle (2) Precipitation processes		WR 1.1-1.3 WR 2.1-2.1.1
Sep 29	Precipitation-clouds Precipitation measurements		WR 2.1.2-2.2.3 Jones 5.2
Sep 30	Assignment #1 tutorial	#1 due Oct 13, 10%	
Oct 06	Precipitation analysis Evaporation processes		WR 2.6; Jones 4.2 WR 4.1-4.2
Oct 13	Transpiration processes Evaporation estimation Evaporation measurements		WR 4.4.3-4.4.4 WR 4.6.1-4.6.2 Jones 5.3
Oct 14	Assignment #2 tutorial	#2 due Oct 27, 10%	
Oct 20	Mid-term test Interception processes Interception estimation	Mid-term, 20%	WR 3.1-3.4 WR 3.6
Oct 27	Soil water (soil properties) Soil water movement (I)		WR 6.1-6.3.2 WR 6.3.3-6.3.5
Oct 28	Assignment #3 tutorial	#3 due Nov 17, 10%	
Nov 03	Soil water movement (II) Soil water measurement		WR 6.4 (up to Eq. 6.3) WR 6.3.6; Jones 5.5
Nov 10	Fall Break		
Nov 17	Ground water (storage) Ground water movement (I)		WR 5.1-5.4.1 WR 5.5-5.5.2
Nov 24	Ground water movement (II) Runoff (sources and processes)		WR 5.5.3 WR 7.1-7.3.4
Nov 25	Assignment #4 tutorial	#4 due Dec 08, 10%	
Dec 01	Runoff (event-based) Runoff (temporal variations)		WR 7.4.1-7.4.2 WR 7.4.4-7.7
Dec 08	Runoff (spatial variations) Conclusion and review		Jones 4.2.1 and 6.1.1
Dec 11 (tentative)	Pre-exam tutorial		
		Final exam, 40%	

WR: Ward and Robinson (2000) – textbook

Jones: Jones (1997) – reference book

Note: Any additional readings are to be provided in class in advance.

The assignment reports are normally given to the instructor on the Monday class, but they can be put in an envelope on the instructor's office door (PGB Room 305) before 5 pm of the due date.

Students also need to review materials in GGR101 or review Chapters 2, 7, and 9 in R. W. Christopherson (2000), *Geosystems: An Introduction to Physical Geography*, 4th Edition, Prentice Hall, New Jersey.

Hydrological analyses require some basic mathematical skills from simple summations to logarithmic functions. Students who are incapable of logarithmic operations are not encouraged to take this course. Logarithmic functions would be the most complex functions used in this course. Calculus is not required.

Geography Math Help Centre

Another resource for this course is the department's new Math Help Centre. Geography TAs will be available to help refresh and explain mathematical concepts and techniques that may come up in your GGR courses. This

includes working with formulas, graphing data, completing calculations, and so forth. It does not matter how basic your questions are! No appointment is required, just drop by. There will also be table space available in the room, allowing students to get math help as they work through assignments. Details on location and TA times posted here: <http://geography.utoronto.ca/undergraduate/math-help/>