



CIVE 340 – Sustainable Water Resources

Term – FALL 2017

Instructor: Tom Gleeson (250) 853 -3934 tgleeson@uvic.ca

Office hours: Wednesday 9-10 in ECS 316

Please come to see me during office hours only. Please place “CIVE 340” in the email subject for all email correspondence. I will try to return emails within 24 hours of being sent during a work week but will not respond to emails sent within 24 hours of a test or assignment due date.

Teaching Assistants: Thomas Boerman tboerman@uvic.ca and Vahid Moradi vmoradi@uvic.ca

Office hours: 11:00-12:00 on Wednesday in ELW B220

Course Description

Design and environmental integration of a water resource system using simulation and geomatics software. Introduction to hydrology; hydraulic engineering, and water resources planning; environment and management of watersheds and ecosystems; risk and uncertainty; urban water systems and water quality; economic demand and supply principles, externalities.

Learning Outcomes

- Discuss and appreciate the complexity of global water resource problems and solutions
- Derive and quantify relevant environmental processes across space-time scales for water resource problems
- Analyze observations to derive predictions and design solutions
- Apply understanding of hydrologic and hydraulic processes to water resource problems such as drinking water supply, river routing and flooding
- Creatively solve problems individually and in small groups

Active engaged classroom: Coming to class and participating is important and will lead to a better grade. Numerous activities in class will encourage active, engaged learning – we’re here to learn together. Studies show that distractions impair learning so computers are only to be used for note-taking. **Web-browsing, texting or social media are not allowed during class time** because this can distract other students and impact the classroom atmosphere.

Schedule

A01 (lecture) Monday and Thursday 8:30 – 9:50 ECS 124	B01 Monday 1:30 pm - 4:20 pm ELW B220	B02 Tuesday 11:30 pm - 2:20 pm ELW B220
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Text books:

The required text for this class is:

- Mays, L.W. *Water resources engineering*. Wiley, 2011. Can be purchased at the bookstore or Amazon for ~\$190 or the e-book can be purchased from Wiley for ~\$62.00. On reserve at library.

Other useful books:

- Mays, L.W. *Ground and surface water hydrology*. Wiley, 2012. On reserve at library.
- Hoekstra, et al (2011). *The water footprint assessment manual: setting the global standard*. Earthscan, London, 203 pp. Available for download.

Assessment:

25% Assignments

20% Midterm

10% Final Project

40% Final Exam

5% Participation in classroom activities

- This course is designed to emphasize both quantitative and qualitative learning of water resource concepts, theory and practice, both in pairs and individually.
- All assignments and projects should be completed and handed in with a partner and will be graded together.
- All assignments and projects should be uploaded through the CourseSpaces to reduce paper use (and may be analyzed Turnitin, a digital plagiarism program). All assignments and projects are due at 12 noon on the date shown on CourseSpaces or modified by the instructor or TA.
- The late penalty is 20% per day, starting at 12:05 on the due date (i.e. 20% will be deducted from an assignment handed in 12:06 on the due day).
- Participation marks will be based on i>clickers. Starting after the **add-drop date** (to give you time to purchase an i>clicker), participation will be quantified through the use of clickers. Full marks will be given for participating in most of the activities for 80% of classes as shown by clicker use. Partial marks will be given for participating in <80% of classes.

Bonus marks

- 0.5% per week for being ‘water news editor’ – deciding the top two most interesting and relevant of the posted news stories and introducing them to the class on Thursday
- 1% for posting and announcing a recent and chosen ‘water news story’ to class to a max of 3%

Note: The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Undergraduate Calendar. **There will be no supplemental examination for this course. Alternative dates for the midterm or final will not be available unless students have sufficient documentation demonstrating a need for absence due to a death in the family or illness.**

Syllabus See the tentative schedule on Coursespaces.

Topic (Units are numbered)	Reading
1. <u>Introduction and water footprints</u> Why hydrology and water resources? global water uses and problems; water footprint and scarcity; water uses spatially and by sector	CH 1 and CH 11.1 -11.4
2. <u>Review: Hydraulic process, hydrologic budgets, and statistics in hydrology</u> Principles of hydraulic flow; control volume and hydrologic budgets across spatial and temporal scales; global water distribution and residence times; watershed characteristics; Probability and frequency analysis; non-stationarity	CH 3 CH 7.1 CH10
3. <u>Hydrologic processes</u> Weather and the atmosphere; precipitation; evaporation and transpiration; infiltration	CH 7
4. <u>Groundwater processes</u> Occurrence and movement of groundwater; hydraulic head; groundwater; surface water interactions and conjunctive use	CH 6
5. <u>Runoff and stream processes</u> Runoff processes and flow measurement; rainfall-runoff analysis and modelling; stream processes and characteristics	CH8
6. <u>Water distribution systems</u>	CH12
7. <u>Reservoir and river routing and floodplain analysis</u>	CH9 and CH14
8. <u>Sustainable water resource management</u> Goals, perspectives, and role of engineers/scientists; integrated water resource management; virtual water, water footprints, sustainability and ethics	

Note to Students: Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Secretary to set up an appointment.

Accommodation of Religious Observance See entry in current Undergraduate Calendar

Policy on Inclusivity and Diversity See entry in current Undergraduate Calendar

Standards of Professional Behaviour You are advised to read the Faculty of Engineering document Standards for Professional Behaviour in current Undergraduate Calendar, which contains important information regarding conduct in courses, labs, and in the general use of facilities. Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult entry in current Undergraduate Calendar for the UVic policy on academic integrity.

Course Lecture Notes Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.

Equality: This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to

successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Resource Centre for Students with a Disability located in the Campus Services Building. The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.