



Faculty of Engineering
Department of Civil Engineering
COURSE OUTLINE

CIVE340 – Sustainable Water Resources - Fall 2020 (202009/CRN 10594)

Instructor	Office Hours
Tom Gleeson tgleeson@uvic.ca 250-853-3934	By contact

List all prerequisites and co-requisites: CIVE210 and CIVE345

SYNCHRONOUS LECTURE TIMES

Section: A01	Days: Monday & Thursday	Time: 8:30-9:50 PST	Location: Zoom
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LAB SECTIONS

B01	Tuesday	9:30 - 12:20 PST	Location: Zoom
Lab #2: B02	Friday	2:30 – 5:20 PST	Location: Zoom

Lab times and locations are also available from the [timetable](#).

TA Name	E-mail	Office Hours
Thomas Boerman	tboerman@uvic.ca	1-2 pm Monday
Kelsey Shaw	kelsey.alexandra.shaw@gmail.com	Location: Zoom
Sreekumari Raghavan	sreekumariraghavan@uvic.ca	

Recommended Text
Title: Water Resources Engineering, 2 nd Edition
Author: Mays, Larry W
Publisher/Year: Wiley/2011

COURSE OBJECTIVES:

Covers fundamental aspects of hydrology, hydraulics, and water resources engineering. Topics include human water use and water footprints; calculating water budgets for control volumes and watersheds; understanding and quantifying hydrological fluxes such as precipitation, evaporation, and ground/surface water flow; human management of hydrologic systems including reservoir, water distribution, and flood control systems. Aspects of water sustainability such as integrated water resource management and environmental ethics will be woven through all topics covered in the course. Builds on and complements other courses such as CIVE210 (Sustainability in Civil Engineering) and CIVE345 (Fluid Mechanics).

LEARNING OUTCOMES: At the end of this course, students will be able to:

- Discuss and critique the complexity of global water resource problems and solutions
- Identify and quantify environmental processes related to water resource problems
- Analyze observations to derive predictions and design solutions
- Apply understanding of hydrologic and hydraulic processes to investigate water resource problems such as drinking water supply, river routing and flooding
- Creatively solve problems individually and in pairs

ASSESSMENT

Assessment	Weight	Date
Assignments: 6	30%	See brightspace
Mid-term	30%	Date: 2020-10-29
Final Exam	40%	Date: TBA

Failure to pass the final exam will result in a failing grade for the course. 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.

Bonus marks to encourage engagement during and outside of class time

- **Water in the news:** 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 Monday; 1% for posting and announcing a recent and chosen ‘water news story’ to class to a max of 3%
- **Water-related songs and movies:** 1% each for the for most highly-rated song and movie in the respective discussion forums by the midterm as well as on the last day of class
- **Interactive content:** for each topic I will highlight online webtools, games, articles, podcasts or videos to RELATE COURSE CONTENT TO YOUR LIFE. You will receive 0.5% (for total of 3% for the term) for each time you answer all the discussion question about this interactive content.
- **New interactive content:** 2% each for the for most highly rated NEW online webtools, games, articles, podcasts or videos to relate course content to your life by the midterm as well as on the last day of class

ASSIGNMENTS and LABORATORIES

Six problem sets will be distributed and submitted in brightspace. The assignment problems will involve the acquisition and synthesis of data from online sources, performing calculations and analysis by hand and/or with software (e.g. Excel), plotting results, and more. Assignments are to be completed in teams of 2 students.

Students are required to work with a different partner on each assignment. **Assignments are due one week after they are handed out at the beginning of the next lab period.** Late penalty is 20% per day.

The laboratory sessions will be used to complete instruction and provide support related to the assignments, and possibly perform additional instructional activities such as the use of groundwater flow tanks.

Topic (Units are numbered)	Reading
<u>1. 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
<u>2. Water budgets and where we find water:</u> Principles of hydraulic flow; control volume and hydrologic budgets across spatial and temporal scales; global water distribution and residence times; intro to watersheds, lakes, glaciers and groundwater	CH 3 CH 7.1 CH10
<u>3. Atmospheric and land surface 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>Surface water processes</u> : Runoff processes and flow measurement; rainfall-runoff analysis and modelling; stream processes and characteristics	CH8
6. <u>Probability and statistics in hydrology</u> : Probability and frequency analysis; non-stationarity	
7. <u>Water distribution systems</u>	CH12
8. <u>Reservoir and river routing and floodplain analysis</u>	CH9 and CH14
9. <u>Sustainable water resource management</u> : Goals, perspectives, and role of engineers/scientists; integrated water resource management; virtual water, water footprints, sustainability and ethics; water economics	

GENERAL INFORMATION

An encouragement to take care of yourself

A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone.

Counselling Services - *Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students.* <https://www.uvic.ca/services/counselling/>

Health Services - *University Health Services (UHS) provides a full service primary health clinic for students, and coordinates healthy student and campus initiatives.*

<http://www.uvic.ca/services/health/>

Centre for Accessible Learning - *The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations*

<https://www.uvic.ca/services/cal/>. *The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.*

Elders' Voices - *The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty and administration in Indigenous ways of knowing and being.*

<https://www.uvic.ca/services/indigenous/students/programming/elders/index.php>

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.

Concerns:

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.

Attendance

Students are expected to attend all classes in which they are enrolled. An academic unit may require a student to withdraw from a course if the student is registered in another course that occurs at the same time. An instructor may refuse a student admission to a lecture, laboratory, online course discussion or learning activity, tutorial or other learning activity set out in the course outline because of lateness, misconduct, inattention or failure to meet the responsibilities of the course set out in the course outline. Students who neglect their academic work may be assigned a final grade of N or debarred from final examinations.

Accommodation of Religious Observance

The University recognizes its obligation to make reasonable

accommodation for students whose observance of holy days might conflict with the academic requirements of a course or program. Students are permitted to absent themselves from classes, seminars or workshops for the purposes of religious or spiritual observance. In the case of compulsory classes or course events, students will normally be required to provide reasonable notice to their instructors of their intended absence from the class or event for reasons of religious or spiritual observance. In consultation with the student, the instructor will determine an appropriate means of accommodation. The instructor may choose to reschedule classes or provide individual assistance. Where a student's participation in a class event is subject to grading, every reasonable effort will be made to allow the student to make up for the missed class through alternative assignments or in subsequent classes. Students who require a rescheduled examination must give reasonable notice to their instructors. If a final exam cannot be rescheduled within the regular exam period, students may request an academic concession.

To avoid scheduling conflicts, instructors are encouraged to consider the timing of holy days when scheduling class events. For further information, including a list of days of religious observances, please contact the Equity and Human Rights Office or visit their website: web.uvic.ca/eqhr

Discrimination and Harassment Policy (GV0205)
<http://web.uvic.ca/calendar/general/policies.html>

Standards for Professional Behaviour

"It is the responsibility of all members of the Faculty of Engineering, students, staff and faculty, to adhere to and promote standards of professional behaviour that support an effective learning environment that prepares graduates for careers as professionals...."

You are advised to read the Faculty of Engineering Document [Standards for Professional Behaviour](https://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf) which contains important information regarding conduct in courses, labs, and in the general use of facilities.

<https://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf>

Policy on Academic Integrity

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the Undergraduate Calendar <http://web.uvic.ca/calendar/undergrad/info/regulations/academic-integrity.html> for the UVic policy on academic integrity.

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."