
CIVE 410 – Solid Waste, Air, and Water Pollution**Term – Summer 2020 (202005)**

We acknowledge with respect the Lekwungen peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.

Time and Location

Lectures: Tuesdays 12:30 to 3:20 PM, Online/Remote (30113 A01)

Tutorials: Wednesdays 3:30 to 6:20 PM, Online/Remote (30108 B01 and 30110 B02)

Instructors

Lecturer:

Claire Remington, MASc

No office

No office hour

cremington@uvic.ca

778-535-4249

Teaching Assistant(s):

1. Kelsey Shaw

No office

No office hour

kelsey.alexandra.shaw@gmail.com

2. TBD

List all prerequisites and co-requisites: CIVE 310 Environmental Engineering

Course Objectives

Urban sources of air and water pollution, acute and chronic health effects of pollution taught through case studies; environmental quality standards and compliance criteria in BC and Canada; air and water quality modelling for prediction, introduction to software; integrated waste management and design, reduce, reuse, recycle, resource recovery and utilization, composting, fundamentals of waste degradation and disposal, geo-environmental aspects of landfill design, leachate and gas management at landfills.

Learning Outcomes: At the end of this course, students will be able to:

- Solid Waste:
 - Describe key components and objectives of solid waste management
 - Integrate principles of the pollution prevention hierarchy into solid waste management
 - Calculate dry and wet weight generation rates for specific components from available data
 - Determine appropriate C/N ration for composting
 - Calculate oxygen requirements and methane generation rates using stoichiometry and mass composition
 - Explain concerns of landfill leachate
 - Calculate area of landfills based on daily cell construction

- Identify key public policy consultation methods and their strengths and weaknesses
- Estimate costs for different-sized landfills, using economy-of-scales factors
- Air:
 - Describe how the urban, regional, and global scale of different air pollutant problems influence chemical reaction, transport, and impact
 - Understand and apply the IPAT equation to automotive emissions
 - Describe the important features of the air pollutants of the troposphere and the stratosphere
 - Describe the formation of CO₂ during combustion
 - Write and explain the chemical reactions that describe the formation of ground-level and stratospheric ozone
 - Differentiate between point, area, and mobile sources of air emissions
 - Describe and differentiate between different emission control strategies
 - Explain meteorological and ground-level features influence atmospheric stability and the vertical and horizontal movement of air parcels
 - Apply Gaussian dispersion models to estimate downward wind concentrations of pollutants.
- Water:
 - Describe the sources of water pollution
 - Understand the impacts of water pollution on public and environmental health
 - Describe, in words and mathematically, the different types of reactors – batch, CSTR, and plug-flow
 - Calculate the hydraulic retention time for the different types of reactors

Syllabus

Week	Module	Dates	Topic
1	Solid Waste	May 4 - May 8	Introduction to solid waste pollution
2		May 11 - May 15	Recycling & reuse
3		May 18 - May 22	Landfills Pt. 1: Design and operation
4		May 25 - May 29	Landfills Pt. 2: Gas and leachate management
5	Air	June 1 - June 5	Introduction to air pollution
6		June 8 - June 12	Modeling and understanding pollution and its sources
7		June 15 - June 19	Monitoring emissions and compliance with applicable regulations
8		June 22 - June 26	Designing and implementing air quality improvement solutions
9		June 29 - July 3	Reading Week - No Lecture
10	Water	July 6 - July 10	Introduction to water pollution
11		July 13 - July 17	Fate and transport of pollutants in water
12		July 20 - July 24	Analysis and modeling of water quality
13		July 27 - July 31	Designing and implementing water quality improvement solutions

Required Text

There is no required text for this course. All readings will be available electronically through the UVic library (i.e. accessible on-campus or through a proxy server off-campus).

Assessment

I expect that UVic students, on average, will perform at a B level. The following are the components of how students will be assessed along with their respective weighing and due dates (when applicable).

Evaluation	%	Breakdown		Date ⁴
Participation ¹	5%			Ongoing
Assignments	30%	6% 8% 8% 8%	A1: Behavioral Insights A2: Solid Waste A3: Air A4: Water	May 15 (B01) and May 22 (B02) May 29 (B01) and June 5 (B02) June 19 (B01) and June 26 (B02) June 24 (B01) and July 31 (B02)
Tests ²	30%	10% 10% 10%	Test 1 Test 2 Test 3	June 3 July 7 July 29
Final Report ³	35%	1% 4% 10% 19% 1%	Proposal Updated Proposal Draft Report Final Report Peer & Self-Assessment	May 8 May 29 June 26 August 7 August 7

¹ Includes short assignments submitted online and participation in the discussion forum in CourseSpaces.

² You must pass all tests to pass the course.

³ You must complete your share of the writing of the report to pass the course.

⁴ Unless otherwise noted, all assignments and submissions are due on Friday before midnight (PDT) in CourseSpaces.

Assignments:

Assignments for the course include module assignments, participation in discussions, and short assignments. All assignments will be discussed in class and posted to the CIVE 410 CourseSpaces site. **Electronic submission via CourseSpaces are required.** Late submissions have a penalty of 20% per day and are not longer accepted after 5 days. Assignments are to be completed individually.

Assignment	Modules	Start	Due
Behavioral Insights	Solid Waste	May 4 th	May 15 th (B01) or May 22 nd (B02)
Solid Waste	Solid Waste	May 18 th	May 29 th (B01) or June 5 th (B02)
Air	Air	June 8 th	June 19 th (B01) or June 26 th (B02)
Water	Water	July 13 th	July 24 th (B01) or July 31 st (B02)
Various	Short Assignments	To be discussed in class	

Project:

- A research report on a topic of your choosing related to the topics of the course (solid waste, air, or water pollution) is to be completed.
- Students are to work in groups of 4.
- The topic of your research should be unique. A draft proposal should be submitted by **individuals** by May 8th. The remainder of the research project will be done in groups, but the first draft proposal should be completed and submitted as individual work.
- Additional information regarding grading rubrics and project expectations will be shared on CourseSpaces.
- All components of the project report (see below) should be submitted **electronically via CourseSpaces** according to the schedule below. Late submissions have a penalty of 20% per day and are not longer accepted after 5 days.

Assignment	Modules	Start	Due
Draft Proposal	Research Project	May 4 th	May 8 th
Updated Proposal	Research Project	May 11 th	May 29 th
Draft Report	Research Project	June 1 st	June 26 th
Final Report	Research Project	July 6 th	August 7 th
Peer & Self-Assessment	Research Project	May 11 th	August 7 th

NOTE:

- Tests and assignment due dates may need to be slightly altered to accommodate schedule of visiting guest lecturers. Any rescheduling will occur at least one week in advance.
- A 10 to 15-minute break will be provided approximately half-way during class.
- As a courtesy, cell phones should be turned to silent during class.
- All course material will be provided on CourseSpaces.
- All the materials I have provided are intended for use in this course online. Do not recirculate these materials digitally.
- All deadlines and schedules in this course will reference Pacific Daylight Time

Course Withdrawal Deadlines:

- May 16: Withdrawal with 100% reduction of tuition fees
- June 6: Withdrawal with 50% reduction of tuition fees
- July 1: Last day for withdrawal (no fees returned)

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.

Grading: Please see the Grading information in the current calendar at:

<https://www.uvic.ca/calendar2020-05/undergrad/index.php/home#/policies>

Course policies and guidelines

Late Assignments: *No late assignments will be accepted unless prior arrangements have been made with the instructor **at least 48 hours before** the assignment due date.*

Coursework Mark Appeals: *All marks must be appealed **within 7 days** of the mark being posted.*

Attendance: We expect students attend all lectures and labs. It is entirely the students' responsibility to recover any information or announcements presented in lectures from which they were absent.

Electronic devices in labs and lectures: No unauthorized *audio* or *video* recording of lectures is permitted.

Electronic devices in midterms and exams: Calculators are only permitted for examinations and tests if explicitly authorized and the type of calculator permitted may be restricted. No other electronic devices (e.g. cell phones, pagers, PDA, etc.) may be used during examinations or tests *unless explicitly authorized*.

Plagiarism: Submitted work may be checked using plagiarism detection software. Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the link given below for the UVic policy on academic integrity. Note that the university policy includes the statement that "*A largely or fully plagiarized assignment should result in a grade of F for the course.*"

Academic Integrity: You must make yourself aware of the University of Victoria guidelines and policy concerning fraud and academic integrity at this link, <https://www.uvic.ca/current-students/home/academics/academic-integrity/index.php>

Policy on Academic Integrity: <https://www.uvic.ca/calendar2020-05/undergrad/index.php#/policies>

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. Please find the document at this link: <https://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf>

Notes 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.

University of Victoria Privacy Policy: If any student has concerns about their private information being stored or accessed outside of Canada, they are required to inform the course instructor about their concerns before the end of second week of classes.

Accommodation of Religious Observance: See entry in current Undergraduate 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 Centre for Accessible Learning located in the Campus Services Building, <https://www.uvic.ca/services/cal/>.

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.

Sexualized Violence Prevention and Response at UVic: UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting www.uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:

Where: Sexualized violence resource office in EQHR; Sedgewick C119

Phone: 250.721.8021

Email: svpcoordinator@uvic.ca

Web: www.uvic.ca/svp

Policy on Inclusivity and Diversity: See the entry in the current Undergraduate Calendar.

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.

Syllabus statement

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>

The **Office of the Ombudsperson** is an independent and impartial resource to assist with the fair resolution of student issues. A confidential consultation can help you understand your rights and responsibilities. The Ombudsperson can also clarify information, help navigate procedures, assist with problem-solving, facilitate communication, provide feedback on an appeal, investigate and make recommendations.

Phone: 250-721-8357; Email: ombuddy@uvic.ca; Web: uvicombudsperson.ca.