ORIGINAL COURSE IMPLEMENTATION DATE: September 2024

REVISED COURSE IMPLEMENTATION DATE:

COURSE TO BE REVIEWED (six years after UEC approval)**:** January 2030

Course outline form version: 28/10/2022

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ENV 321	**Number of Credits:** 4 Course credit policy (105)
Course Full Title: Science of Waste Management **Course Short Title:** Science of Waste Management	
Faculty: Faculty of Science	**Department:** Planning, Geography, and Environmental Studies

Calendar Description:

Introduces the science behind the management of solid, liquid, and hazardous waste, which is one of the most pressing environmental issues affecting ecosystems and societies alike. Students will learn about methods and processes for integrated waste management, risk assessments, and sustainable waste treatment and disposal options. Includes a local context of waste-to-energy programs within agricultural industries in the Fraser Valley.

Note: Students with credit for **GEOG 300W** cannot take this course for further credit.

Prerequisites (or NONE):	45 university-level credits.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number: **GEOG 300W**

Cross-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	20
Experiential (field trip)	15
Supervised laboratory hours (science lab)	25
Total hours	**60**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**

(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**

(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **Face-to-face only**

Expected frequency: **Every other year**

Maximum enrolment (for information only)**: 28**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See **bctransferguide.ca**.)*

Transfer credit already exists: **No**

Submit outline for (re)articulation: **Yes**

(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	September 2023
Faculty Council approval	**Date of meeting:**	October 6, 2023
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	January 26, 2024

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

Upon successful completion of this course, students will be able to:

1. Describe the scientific concepts that underpin the current generation and management of solid, liquid, and hazardous waste.
2. Utilize field and library research techniques to show the relationship among consumerism, the circular economy, and the generation and management of waste.
3. Assess risk of current waste management strategies in terms of physical, social, economic, and legal criteria.
4. Apply a Two-Eyed Seeing approach to design cross-cultural management of major waste streams.
5. Explain why EDI in general, and gender dynamics in particular, matter in sustainable waste management.
6. Inclusively communicate current waste management practices in the Fraser Valley through technical reports, visualization, and/or presentation.
7. Demonstrate the proof-of-concept of an alternative waste management technology.
8. Reflect on their individual commitment in reducing waste resulting from their personal activities.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Quizzes/tests:	20%	Assignments:	20%	Project:	20%
Field evaluation:	15%	Lab work:	15%	Holistic assessment:	10%

Details:

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Instructional Methods *(Guest lecturers, presentations, online instruction, field trips, etc.)*

The course will consist of lectures from instructor and guests followed by lab and field demonstrations, and field trips to waste management enterprises in the Fraser Valley. The students will develop and demonstrate a proof-of-concept for a waste management idea and write a reflection of their personal commitment to reducing waste.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.	Textbook	Raut, Kokare, Bhanvase, Randive, Dhoble (Editors)	360-Degree Waste Management, Volume 1- Fundamentals, Agricultural and Domestic Waste, and Remediation	2023
2.	Textbook	Tao, Yucai, and Nyankson	Resource Recovery Technology for Municipal and Rural Solid Waste - Classification, Mechanical Separation, Recycling, and Transfer	2023
3.	Online resource	World Economic Forum	Future of the Environment: What can we learn from indigenous people about waste management?	2023
4.	Article	Fan, Khalique, Qalati, Gillal & Gillal	Antecedents of sustainable e-waste disposal behavior: the moderating role of gender	2022
5.	Article	Assuah, Anderson	How Indigenous cultural practices can improve waste management in communities	2023

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

Students should be prepared for outdoor field work and wear appropriate clothing and shoes. Other necessary tools will be supplied.

Course Content and Topics

1. Introduction to science of waste management
2. Municipal solid waste and landfill management
3. Consumerism, waste, and the circular economy
4. Recycling and resource recovery
5. Indigenous waste management perspectives and gender dynamics in waste management
6. Organic waste management: composting, earthworm technology, mycelium technology, and biogas
7. Wastewater treatment: current and alternative technologies
8. Risk assessment and waste regulations
9. Remediation and hazardous and e-waste