

Wastewater Collection Level 1 & 2

Course Outline

Course Description

This 4.5 day (27 hour) course is designed to prepare the participants to write their Environmental Operators Certification Program (EOCP) certification exam for Level 1 or 2 Wastewater Collection.

This course provides a basic knowledge of wastewater collection practices and focuses on the practical aspects of system construction, operation and maintenance.

Course Pre-requisites

There are no specific pre-requisites for this course. However, Grade 12 (or equivalent) math skills are an asset. Math upgrades are available –contact us.

Continuing Education Units (CEUs)

This course is accepted with EOCP for 2.70 CEUs as core for WWC, SWWS and Related for WT, WD, SWS, WWT.

Course Duration

- 4.5 day
- 8:30 am to 4:00 pm each day, except last day from 8:30 am to 12:00 pm
- 1 hour lunch break
- 15 minute breaks morning and afternoon

Course Topics and Learning Outcomes

1: Introduction, Safety and System Hydraulics

By the end of the course, the students will be able to:

- Understand and practice safe procedures in the workplace, including;
 - Safety Programs
 - First Aid
 - Site Safety
 - Excavation Safety
 - Confined Space Entry
 - Traffic Control
 - Personal Protective Equipment
 - Electrical Safety and Lock-out
 - WHMIS
 - Fire Extinguishers
 - Chemical Handling
- Apply basic hydraulic concepts to gravity flow and forced systems

2: Operator Mathematics and Practical Calculations (Math Assignment)

By the end of the course, the students will be able to:

- Convert units of measurement (within the Metric system and Metric to Imperial)
- Apply the principle of “order of operations” to math calculations
- Calculate percentages and apply to chemical concentrations
- Calculate area and volume
- Arranging formulas to solve for different unknown quantities
- Use algebraic formulae to solve Velocity and Flow, Pipeline Elevation and Slopes, Chemical Concentration and Dilution, and Electrical Power problems

3: Wastewater Chemistry

By the end of the course, the students will be able to:

- Recognize and control water and blood borne pathogens
- Identify various types of dangerous sewer gases
- Understand the formation of hydrogen sulfide gas in sewer systems.
- Understand the chemical control of hydrogen sulfide gas.

4: Plan Reading and Pipe Materials

By the end of the course, the students will be able to:

- Recognize basic types of engineering drawings and their purposes
- Identify desirable pipe material characteristics and uses

5: Pipeline Design Concepts and Construction Layout

By the end of the course, the students will be able to:

- Identify design periods
- Understand how to calculate flows and perform actual flow measurements in the field
- Recognize the characteristics of flow variations
- Understand leveling and establish elevations
- Develop cut sheets for mainline construction
- Apply construction controls in the field

6: Sewer Construction, Inspection and Testing

By the end of the course, the students will be able to:

- Recognize safety parameters regarding sewer construction projects.
- Describe phases of construction project
- Understand survey principles and develop pipeline construction cut sheets
- Understand mainline construction and service installations
- Identify inspection points and testing standards
- Describe varieties of trenchless pipe replacement technologies

7: Lift Stations and Pumps

By the end of the course, the students will be able to:

- Describe the usage for lift stations and their configuration
- Recognize various types of pumps, their components and operations.
- Understand pump motor controls
- Understand pump hydraulic theory

8: System Maintenance and Flow Analysis

By the end of the course, the students will be able to:

- Identify hydraulic and mechanical pipeline cleaning techniques
- Recognize inspection and testing techniques on existing systems
- Be able to perform maintenance on sewer systems
- Identify tools and methods of flow studies to measure existing system capacity.

9: Exam Tips and Sample Questions

By the end of the course, the students will be able to:

- Practice techniques for writing multiple-choice exams
- Answer sample multiple-choice questions

Delivery Method/Format

Instructional Method	Percentage of Class Time
Hands-on/Q & A	20%
Examples/Case Study	20%
Presentation/Lecture	10%
Slides	35%
Demonstration (field trip if applicable)	5%
Video/DVD	5%
Tutoring	5%

Material/Handouts (supplied)

- Student Binder: Yukon University. Wastewater Collection Level 1 & 2; a core –EOCP Exam Preparation– course.
- EOCP Course Completion and Evaluation Form.
 - every student needs to complete and return this form for any CEU allocation
- Calculators are provided but students are welcome to use their own.
 - please return

Course Requirements

Attendance and participation in class are required. It is the student’s responsibility to attend all classes.

CEUs will be allocated based on attendance and course completion; Yukon University records will show a pass or fail result. If the participant doesn’t attend the class, Yukon University records will show a “no show” result and no CEUs will be allocated.

Evaluation

There will be a quantifiable evaluation at the end of this course with a passing mark of 70%. If anyone fails this evaluation, arrangements can be made for a re-assessment. Please note that this evaluation is for self-assessment purpose only.

The final evaluation for this course is NOT an EOCP certification exam. To challenge a certification exam, register separately with EOCP at least 3 weeks in advance: crm.eocp.ca or 1-866-552-3627.

Appropriate Language

In all areas of the University environment, students are responsible for showing respect for others. Swearing, or language that is discriminatory or derogatory in relation to race, sex, ethnic background, religious beliefs, age, and physical condition is not appropriate.

Electronic Devices

In order to be successful in classes and minimize distractions for others, cell phones, iPods, and other electronic devices must be turned off while students are in class. In an emergency situation, the instructor may give a student permission to use a cell phone or pager.

Academic and Student Conduct

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/Admissions & Registrations web page.

Plagiarism

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the University.

Academic Accommodation

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon University Academic Regulations (available on the Yukon University website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, they should contact the Learning Assistance Centre (LAC) at LearningAssistanceCentre@yukonu.ca.

Class Outline

*does not include breaks and lunch (6 hour contact time/day)

Day 1	Introduction	0.5 hours
	Safety	4.5 hours
	<ul style="list-style-type: none"> • Safety programs • First aid • Site safety • Excavation Safety • Confined space entry • Traffic control • Personal protective equipment • Electrical safety and lockout • WHMIS • Fire extinguishers • Chemical handling 	<ul style="list-style-type: none"> • 10 mins • 15 mins • 15 mins • 1hour 30mins • 1 hour • 15 mins • 20 mins • 45 mins • 15 mins • 15 mins • 30 mins
	Sewer System Hydraulics	1 hour
	<ul style="list-style-type: none"> • Understand fundamental principles related to pressure, velocity and flow in a collection system 	
Day 2	Operator Mathematics and Practical Calculations	6 hours
	<ul style="list-style-type: none"> • Unit conversion • Math functions and order of operations • Percentages • Area and volume calcs • Arranging formulas to solve for different unknown quantities • Velocity, flow rate, slopes, electrical power, chemical dosages and dilutions calcs 	<ul style="list-style-type: none"> • 30 mins • 30 mins • 30 mins • 1 hour 15 mins • 1 hour 15 mins • 3 hours

Day 3	Review Assignment 1 (math)	30 mins
	Wastewater Chemistry	1 hour
	<ul style="list-style-type: none"> Recognize and control water and blood borne pathogens Identify various types of dangerous sewer gases Understand the formation of hydrogen sulfide gas in sewer systems. Understand the chemical control of hydrogen sulfide gas. 	<ul style="list-style-type: none"> 10 mins 10 mins 10 mins 30 mins
	Intro to Plan Reading	30 mins
	<ul style="list-style-type: none"> Recognize basic types of engineering drawings and their purposes 	
	Pipe Materials	30 mins
	<ul style="list-style-type: none"> Understand pipe material benefits and characteristics 	
	Pipeline Design Concepts and Construction Layout	2 hours
	<ul style="list-style-type: none"> Identify design periods and determine design flows Understand how to calculate flows and perform actual flow measurements in the field Recognize the characteristics of flow variations Understand leveling and establish elevations Develop cut sheets for mainline construction Apply construction controls in the field 	<ul style="list-style-type: none"> 15 mins 30 mins 15 mins 15mins 30 mins 15mins
	Midterm Exam	1.5 hours
Day 4	Review Midterm Exam	30 mins
	Sewer Construction, Inspection, Testing	3.5 hours
	<ul style="list-style-type: none"> Identify precautions related to sewer construction projects. 	<ul style="list-style-type: none"> 30 mins

	<ul style="list-style-type: none"> • Describe phases of construction project • Understand pipeline installations • Identify inspection points and testing standards • Describe varieties of trenchless pipe replacement technologies 	<ul style="list-style-type: none"> • 30 mins • 1 hour • 1 hour • 30 mins
	Lift Stations Pumps and Controls	2 hours
	<ul style="list-style-type: none"> • Describe the usage for lift stations and their configuration • Recognize various types of pumps, their components and operations. • Understand pump motor controls 	<ul style="list-style-type: none"> • 45 mins • 45 mins • 30 mins
Day 5	System Maintenance	2 hours
	<ul style="list-style-type: none"> • Identify hydraulic and mechanical pipeline cleaning techniques • Recognize inspection and testing techniques on existing systems • Be able to perform maintenance on sewer systems 	<ul style="list-style-type: none"> • 45 mins • 30 mins • 45 mins
	System Flow Analysis	1 hour
	<ul style="list-style-type: none"> • Identify tools and methods of flow studies to measure existing system capacity. 	
	Exam Tips and Sample Questions	30 mins
	<ul style="list-style-type: none"> • Practice techniques for writing multiple-choice exams • Answer sample multiple-choice questions 	<ul style="list-style-type: none"> • 10 mins • 20 mins
	Course Wrap up and Evaluations	30 mins
	Final Exam	2 hours