Water Treatment 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) exam for Water Treatment Level 1 or 2 (required by Yukon Government Regulation).

The main objective of the course is to provide knowledge to operators regarding the provision of safe and reliable drinking water through the water treatment process and appropriate water storage practices.

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 for 2.7 CEUs by EOCP as Core for WD, WT, SWS, BWD and Related for WWC, WWT, SWWS.

Course Duration

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

Course Topics and Learning Outcomes

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

Introduction

- Understand the role of the EOCP

Legislation and Safety

- Review Operator Responsibility
- Review Water Purveyor Responsibility
- Comprehend Water Legislation Terms
- Comprehend Canadian Guidelines for Water Quality
- Understand Legislation and Regulations
- Discuss Water Plant Safety
- Review Excavation and Shoring Safety
- Review Equipment Operation Safety

Hydrology

- Introduce Source Water Quality
- Review Hydrological Cycle
- Review Groundwater and Surface water
- Review Types of Aquifers
- Introduce Basic Hydrogeology
- Define the Components of a Groundwater well
- Review Groundwater Well Performance & Operations
- Evaluate Factors that Affect Water Quality

Math and Hydraulics

- Review Calculator Functions
- Review Order of Operations
- Review Metric and Imperial System
- Review Common Units
- Understand Algebra for Operations for Water Operators
- Understanding Ratios and Proportions for Operations for Water Operators
- Review Averaging
- Review Percent
- Review Perimeter and Circumference Calculations
- Review Area Calculations
- Review Volume Calculations
- Understand Dosing Calculations
- Review Hydraulics

Water Treatment Part I

- Introduce Coagulation
- Introduce Flocculation

- Introduce Sedimentation
- Review Jar Testing
- Introduce Dissolved Air Flotation
- Review Oxidation
- Review Water Softening methods
- Review Adsorption and Taste and Odour Control

Water Treatment Part II

- Introduce Filtration
- Review Diatomaceous Earth (Precoat) Filtration
- Review Slow Sand Filtration
- Review Conventional Filtration
- Review Iron Removal Filtration
- Review Membrane Classification and Filtration
- Discuss Backwashing and Operations
- Discuss Corrosion Control and the Langelier Saturation Index
- Introduce Disinfection
- Discuss Chlorine Types
- Discuss Chlorine Residuals
- Discuss Breakpoint Chlorination
- Analyze Chlorine reactions
- Identify Chlorinators and Hypochlorinators
- Introduce Ultra Violet Disinfection
- Introduce Ozone Disinfection
- Discuss Disinfection By-Products
- Discuss Ct Concept
- Discuss Pathogens & Diseases

Water Distribution

- Review Distribution System Water Quality
- Review Regulatory Requirements
- Review Water Pumping & Storage
- Introduce Water Main Maintenance
- Review Water System Recordkeeping
- Review Appurtenances Common to a Distribution System
- Discuss Types of Fire Hydrants, Their Uses, and Maintenance
- Discuss Water Pipe Construction and Materials
- Review Water Main Flushing Practices
- Review Water Main Leak Detection and Repairs
- Introduce Types of Pumps and Their Construction
- Introduce Lake Intakes and Well Screens
- Introduce Cross Connection Control

Support Services

- Review Basic Electricity
- Review Control Systems
- Introduction to SCADA

Water Sampling

- Demonstrate Sampling Techniques
- Discuss Water Quality Sampling
- Discuss Water Characteristics
- Review Physical and Chemical Water Properties & Analysis
- Review Bacteriological Sampling, Quality, and Analysis
- Review Water Quality Guidelines

Delivery Method/Format

Instructional Method	Percentage of Class Time
Hands-on/Q & A	5%
Examples/Case Study	10%
Presentation/Lecture Slides	60%
Demonstration	10%
Video/DVD	10%
Tutoring	5%

Material/Handouts (supplied)

- Student Binder: Yukon University. Water Treatment Level 1 & 2; a core – EOCP Exam Preparation– course. Whitehorse, Yukon.
- Reference Manual: Office of Water Programs, 2017. Water Treatment Plant Operation, Volume I; a field study training program. 7th Edition. Sacramento, California.
- 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%. 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: 1-866-552-3627 or crm.eocp.ca.

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

Day One – Monday

8:30am – 9:30am	Introduction – Expectations
9:30am – 10:30am	Chapter 1 – Roles and Responsibilities
10:30am – 12:00pm	Chapter 2 – Hydrology
12:00pm – 1:00pm	Lunch
1:00pm – 3:30pm	Chapter 3 – Water Operators Math
3:30pm – 4:00pm	Daily Quiz

Day Two – Tuesday

8:30am – 9:30am	Review – Day One
9:30 – 12:00pm	Chapter 4 – Water Treatment; Part One
12:00pm – 1:00pm	Lunch
1:00pm – 3:30pm	Chapter 4 Water Treatment; Part Two
3:30pm – 4:00pm	Daily Quiz

Day Three – Wednesday

8:30am – 9:30am	Review – Day Two
9:30 – 12:00pm	Chapter 5 – Water Distribution; Part One
12:00pm – 1:00pm	Lunch
1:00pm – 3:30pm	Chapter 5 - Distribution; Part Two
3:30pm – 4:00pm	Daily Quiz

Day Four – Thursday

8:30am – 9:30am	Review – Day Three
9:30am – 10:30am	Chapter 6 – Support Systems
10:30am – 12:00pm	**Water Plant Tour**
12:00pm – 1:00pm	Lunch
1:00pm – 2:00pm	**Water Distribution Tour**
2:00pm – 3:30pm	Chapter 7 – Water Quality
3:00pm – 4:00pm	Daily Quiz

Day Five – Friday

8:30am - 10:00am	Exam Practice and Review – Day Four
10:00am – 12:00pm	Course Completion Exam – 2 Hours