Yukon College

Yukon Water & Wastewater Operator Program

Math Review for Small Wastewater Systems
Course Outline

INSTRUCTOR: Graeme Faris
DATE: January 22, 2018 (Monday)
TIME: 8:30 am – 4:00 pm
LOCATION: Mayo

Course Description
This 1 day (6 hour) course is designed to increase the participant's proficiency with the math components involved in small wastewater systems.

The students are provided with a handbook containing solved examples of every formula found in the EOCP / ABC Canadian Certification Examination formula sheets which are provided to students writing an EOCP exam at the end of the course. The student handbook contains two practice exams.

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.

CEU Credit
This course will be submitted to EOCP and will in all likelihood offer 0.6 CEUs.

Course Duration
- 1 day
- 8:30 am to 4:00 pm
- 1 hour lunch break
- morning and afternoon break (15 minutes each)

Learning Outcomes

Upon successful completion of the course, the students will be able to:
- Set up a math problem
- Use conversion factors
- Employ three useful math "short-cuts" that will simplify the most commonly used math formulas.
- Determine which EOCP/ABC formula to use to solve the mathematical problems found in their exam.

Course Topics

Basic mathematical skills
- Addition, subtraction, multiplication and division
- Linear measurements, areas and volumes
- The metric system
- Exponential notation, rounding and significant figures
- Dimensional analysis to set up complex equations.

Practical application of mathematical skills
- On-site systems and trucked waste
  - ➢ Calculation of detention time, removal efficiency, sizing of disposal fields
- Wastewater collection systems
  - ➢ Velocity and flow in sewers, volumes and detention time in lift stations, pumping rate calculations, pressure and head
- Small wastewater treatment systems mechanical and non mechanical
  - ➢ Lagoons – hydraulic and organic loading rates, areas and volumes, detention time
  - ➢ Mechanical treatment plants – solids retention time, organic and hydraulic loading, food to microorganism ratio, clarifier operations

Delivery Method/Format

Instructional Method	Percentage of Class Time
Hands-on/Q & A	15%
Examples/Case Study	5%
Presentation/Lecture	10%
Slides	40%
Demonstration	30%
Video/DVD	0%
Tutoring	0%

Material/Handouts (supplied)

- Student Binder: Yukon College, 2018. Math Review for Small Wastewater Systems; an elective –Workplace Essential Skills– course. Whitehorse, Yukon
- Companion Document: Faris, G., 2018. Metric Math for Wastewater Operators: A Guide to Using the ABC and EOCP Canadian Formulas. 86 p. Comox, BC.
- 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 College records will show a pass or fail result. If the participant doesn't attend the class, Yukon College 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.

Appropriate Language

In all areas of the college 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 College.

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 College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukoncollege.yk.ca.

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<u>Class Outline</u>

Day	Topic	Time Allocation
08:30 – 08:45	Introduction of students and instructor. Statement of learning goals by students	0.25 hour
08:45 – 10:00	Basic math skills + − × ÷, metric system	1.75 hours
10:00 – 10:15	Health Break	0.25 hour
10:15 – 12:00	Area, volumes, exponents, significant figures, dimensional analysis, conversion factors	1.75 hours
12:00 – 13:00	Lunch	1.00 hour
13:00 – 14:00	On-site systems math	1.00 hour
14:00 – 14:45	Non-mechanical systems math	0.75 hour
14:45 – 15:00	Health Break	0.25 hour
15:00 – 16:00	Mechanical systems math	1.00 hour