



COURSE OUTLINE: OEL869 - HYDRAULICS WTR WASTE

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Approved: Lori Crosson, Director, E-Learning and Continuing Education

Course Code: Title	OEL869: APPLIED HYDAULICS WATER WASTEWATER OP	
Program Number: Name		
Department:	DISTANCE EDUCATION	
Semesters/Terms:	20S, 20F, 21W	
Course Description:	This course is intended to provide students with basics of hydraulics as applicable to the operation of water and wastewater systems. The basic concepts in flow, detention time, pressure, energy, head and power are discussed first. Based on this students are introduced to the use of continuity and energy concepts. The application of continuity and energy equation is illustrated by numerical problems from the areas of water and wastewater. The main objective of the course is to lay a sound foundation in hydraulics concepts as required to understand and apply to the operation of water and wastewater systems. This will allow students to get ready for hydraulic component in various levels of operator certification examinations of the Ontario Ministry of Environment.	
Total Credits:	4	
Hours/Week:	4	
Total Hours:	60	
Prerequisites:	There are no pre-requisites for this course.	
Corequisites:	There are no co-requisites for this course.	
General Education Themes:	Science and Technology	
Course Evaluation:		
Course Outcomes and Learning Objectives:	Course Outcome 1	Learning Objectives for Course Outcome 1
	Examine Standards of measurement	-Use and apply standards of measure and units conversions
	Course Outcome 2	Learning Objectives for Course Outcome 2
	Examine Density	-Explain the difference between SI and USC systems of measurement
	Course Outcome 3	Learning Objectives for Course Outcome 3
	Understand Flow velocity and flow rate	-Make flow, velocity and discharge calculations
	Course Outcome 4	Learning Objectives for Course Outcome 4
	Examine Hydraulic loading	-Apply the concept of head to describe various form of energy in water flow systems
	Course Outcome 5	Learning Objectives for Course Outcome 5
	Examine Hydrostatic pressure	-Identify the basic principles of and recognize the importance of disinfection of water.



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	Course Outcome 6	Learning Objectives for Course Outcome 6
	Examine the Continuity equation	-Define detention time, equivalent population, hydraulic grade, hydraulic grade line and energy grade line
	Course Outcome 7	Learning Objectives for Course Outcome 7
	Examine Energy in water	-To work out pump power for given operating conditions
	Course Outcome 8	Learning Objectives for Course Outcome 8
	Examine Power in water	-To calculate the operating efficiency of pump and determine its performance
	Course Outcome 9	Learning Objectives for Course Outcome 9
	Examine Pump performance	-Read the pump performance curves
	Course Outcome 10	Learning Objectives for Course Outcome 10
Examine Flow measurement	-Understand the operating principle of common flow measuring devices	
Evaluation Process and Grading System:	Evaluation Type	Evaluation Weight
	Final test	50%
	Term test 1	25%
	Term test 2	25%
Date:	March 9, 2020	
Addendum:	Please refer to the course outline addendum on the Learning Management System for further information.	

