

I. COURSE DESCRIPTION:

To present basic knowledge and practices, theories, and application relevant to wastewater flows and characteristics, treatment processes, and plant operations. Basic concepts in wastewater treatment as applied to municipal and compatible industrial environmental systems are discussed.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Assess and evaluate wastewater flows and characteristics.
 - List the physical and chemical characteristics of sewage water
 - Compare primary and secondary treatment
 - Calculate BOD and solids removals
 - Manually prepare a composite sample
2. Perform basic design calculations of primary treatment processes.
 - Name of the devices used in preliminary and primary treatment
 - Calculate hydraulic loading on a clarifier
 - Differentiate between the settling characteristics of primary and secondary clarification
 - Estimate the quantity of sludge produced
3. Operate and trouble shoot an activated sludge process
 - Name the components of a biological process
 - Understand the biology of activated sludge process
 - Calculate F/M ratio and SRT sludge age (SRT)
 - Perform process control tests including oxygen uptake and settleability
 - Calculate the oxygen transfer efficiency
4. Operation of stabilization ponds and fixed growth biological systems
 - Describe various types of stabilization ponds
 - Name the main components of a trickling filter system and a RBC
Describe common operating problems
 - Calculate the loading, storage time available and expected removal efficiencies
 - Describe the working principle of household septic units
5. Diagnose the operating problems related to the operation and control of the activated sludge process.
 - Differentiate between cause and system
 - List steps for troubleshooting
 - Describe the various process control tests
 - Describe various situations causing a process upset

III. TOPICS:

1. Wastewater Flow and Characteristics
2. Preliminary and Primary Treatment
3. Activated Sludge Process (ASP)
4. Other Biological Systems
5. Operation of Treatment Plants

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Water and Wastewater - Technology by Mark J. Hammer and Hammer Junior, Prentice Hall, 6th edition, 2008

Course Manual –by S. Verma, Environmental Training Services, April, 2008, PDF file, LMS

V. EVALUATION PROCESS/GRADING SYSTEM:

Final mark in the course will be based on:

Laboratory Work	25%
Home work/Quizzes	25%
Tests	50%

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 - 59%	1.00
F (Fail)	< 50%	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

VI. SPECIAL NOTES:Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. *It is the departmental policy that once the classroom door has enclosed, the learning process has begun. Late arrives will not be granted admission to the room.*