



**I. COURSE DESCRIPTION:**

This course introduces you to the basic principles and procedures for the design and construction of water distribution, sanitary sewer and storm drainage systems. Land development, planning and administrative policies will be discussed, along with waste management, conventional water and wastewater treatment processes. Sound environmental practices and procedures will be emphasized throughout the course.

**II. LEARNING OUTCOME:**

1. *Demonstrate relevant mathematical, computer and technical problem solving skills as it relates to civil engineering / construction projects.*
2. *Demonstrate an understanding of the working roles and inter-relationships required to adhere to the objectives of the project and work in accordance to labour-management principles and practices.*
3. *Apply sound environmental practices and policies in civil engineering and construction projects.*

**III. TOPIC OUTLINE**

<b>Outcome</b>	<b>Topic and Content</b>	<b>Reading</b>	<b>Week</b>
1,2,3	<b>1. Hydraulics</b>  1.1. Real Life Examples of Hydraulics 1.2. Flow Design Parameters 1.3. Total Energy Calculations 1.4. Losses 1.5. Gravity Flow in Pipes 1.6. Pressure flow in Pipes 1.7. Problem Set/Assignment #1	Chapter 2 Handouts	1-2
1,2,3	<b>2. Hydrology</b>  2.1. Real Life Examples of Hydrology 2.2. Water Uses 2.3. Hydrological Cycle 2.4. Hydrographs 2.5. Rainfall 2.6. Erosion Process and Sedimentation Control 2.7. Surface and Groundwater 2.8. Open Channel Flow and Water Surface Profiling 2.9. Problem Set/Assignment #2	Chapter 3 Handouts	3-4

1,2,3	<p><b>3. Water Distribution System &amp; Mid-term Test</b></p> <p>3.1. Real Life Examples of Water Distribution Systems</p> <p>3.2. Design Factors</p> <p>3.3. Applications for pipe flow formulae</p> <p>3.4. Estimate Water Demands</p> <p>3.5. System Design Calculations</p> <p>3.6. Problem Set/Assignment #3</p> <p><b>3.7. Mid-term Test</b></p>	Chapter 7 Handouts	5-6
1,2,3	<p><b>4. Sanitary Sewer Systems</b></p> <p>4.1. Real Life Examples of Sanitary Sewer Systems</p> <p>4.2. Design Factors</p> <p>4.3. Applications for Pipe Flow Formulae</p> <p>4.4. Estimate Design Flows</p> <p>4.5. Sanitary Sewer Design Calculations</p> <p>4.6. Problem Set/Assignment #4</p>	Chapter 8 Handouts	7-8
1,2,3	<p><b>5. Stormwater Management</b></p> <p>5.1. Real Life Examples of Stormwater Management</p> <p>5.2. Rational Method</p> <p>5.3. Rainwater-frequency-intensity-duration Relationship</p> <p>5.4. Design Storm</p> <p>5.5. Storm Sewer Design Calculations</p> <p>5.6. Problem Set/Assignment #5</p>	Chapter 9 Handouts	9-10
1,2,3	<p><b>6. Water and Wastewater Treatment</b></p> <p>6.1. Real Life Examples of Water and Wastewater Treatment</p> <p>6.2. Water Quality and Chemistry</p> <p>6.3. Treatment of Drinking Water</p> <p>6.4. Treatment of Wastewater</p> <p>6.5. Problem Set/Assignment #6</p>	Chapters 4,5,6 & 10 Handouts	11-12
1,2,3	<p><b>7. Solid and Hazardous Waste</b></p> <p>7.1. Real Life Examples of Solid and Hazardous Waste</p> <p>7.2. Quantities and Characteristics</p> <p>7.3. Processing Recovering and Landfilling</p> <p>7.4. Hazardous Waste Management and Transportation</p> <p>7.5. Legislation for Air, Soil and Water Pollution</p> <p>7.6. Problem Set/Assignment #7</p>	Chapters 11&12 Handouts	13
1,2,3	<p><b>8. Planning</b></p> <p>8.1. Real life Examples of Planning</p>	Handouts	14

- 8.2. Land Development
- 8.3. Official Planning and Zoning
- 8.4. Problem Set/Assignment #8

**9. Review and Final Test**

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**REQUIRED  
RESOURCES/TEXTS/MATERIALS:**

**Basics of Environmental Technology**

Jerry A. Nathason

**IV. EVALUATION PROCESS/GRADING SYSTEM:**

You will be assigned a final grade based on successful completion of laboratories, assignments and tests, weighted as follows:

Assignments	40%
Mid Term Test	30%
Final Test	30%
<b>TOTAL</b>	<b>100%</b>

Each assignment carries equal weight. Late submittals receive only a maximum grade of 60%. However, assignments handed in later that one week will receive a grade of 0%.

An average of 50% on laboratories/assignments and 50% on tests is required for successful completion of this course.

The following semester grades will be assigned::

<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)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	

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.

Assignments and Examination Policy:

If a student is unable to write a test or exam at the scheduled time the following procedure shall apply:

- The student shall provide the professor with advance notice (in writing) of the need to miss the test
- The student shall provide documentation as to the reason for the absence and the make-up will be at the discretion of the professor.
- Upon return the student is responsible to make arrangements for the writing of the test. This arrangement shall be made prior to the next schedule class.
- In the event of an emergency, the student shall telephone the professor as soon as possible at 759-2554, to notify of the absence. If the professor is not available, the college has a 24 hour voice mail system.
- In the event of a test missed due to emergency, the student shall provide documentation from a professional such as doctor or lawyer.

All late assignments (without documentation) will receive a maximum grade of C (60%).

**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.

**VII. COURSE OUTLINE ADDENDUM:**

The provisions contained in the addendum located on the portal form part of this course outline.