SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title:	MUNICIPAL ADMINISTRATION AND SERVICES
Code No.:	CIV 110-4
Program:	CIVIL ENGINEERING
Semester:	III
Date:	JUNE 1988
Author:	S. IENCO

New: _____   Revision: X

APPROVED: _____   Aug 16/88
          Chairperson   Date

CALENDAR DESCRIPTION

MUNICIPAL ADMINISTRATION AND SERVICES	CIV 110-4
COURSE NAME	COURSE NUMBER

PHILOSOPHY/GOALS:

The objective of this course is to introduce the student to municipal services. The topics covered will be basic hydraulics and hydrology, which will enable the student to integrate the design and layout of basic water distribution systems, sanitary sewer systems and storm sewers.

METHOD OF ASSESSMENT:

Assignments	10%
Short Quizzes	20%
Mid Term Examination	30%
Final Examination	40%
	100%

A+	90% - 100%	
A	80% - 89%	
B	70% - 79%	
C	55% - 69%	
R	Repeat	
X	A temporary grade, limited to situations with extenuating circumstances, giving a student additional time to complete the requirements of the course.	

1. Minimum acceptable grade is 55%.

2. Each assignment will carry equal weight. Late submissions will be penalized with a loss of 20% for the first day late and an additional 10% for each subsequent late day.

3. The in-class quizzes will cover one or two problems on a specific topic and are worked under examination conditions.
    Each quiz will carry equal weight.

4. If at the end of the semester your overall average of the combined assignments, short quizzes, mid-semester examination and final examination is below 55%, then it will be up to the instructor whether you receive an "R" repeat or a rewrite.
    The criteria employed for arriving at that decision is class attendance, class participation and overall score.

5. In case a rewrite is granted, it will be permitted only once
    and will be subjected to the following conditions:

    a. It covers the entire semester's course outline.
    b. The maximum obtainable grade is 60%.
    c. The rewrite grade weight is 100%.

TEXTBOOK(S):   Water and Wastewater Technology
                Mark J. Hammer
                John Wiley and Sons.

CIVIL ENGINEERING TECHNICIAN
CIV 110

TOPIC NO.	PERIODS	TOPIC DESCRIPTION
1.		**Hydraulics**
		- Hydrostatic pressure
		- Pressure head
		- Continuity of flow
		- Bernoulli's equation
		- Flow in pipes under pressure
		- Hazen - William equations
		- Gravity flow in pipes
		- Manning's formula
2.		**Water Distribution System**
		- Design water demands
		- System pressure
		- System layout
		- Pipe materials
		- Appurtanances
		- Installation
		- Flow in pipe networks
3.		**Sanitary Sewer System**
		- Materials, pipes, manholes
		- Laterals
		- Design sewage flows
		- Minimum depth
		- Size, slope and invert elevations
		- Sewer constructions
		- Pumping stations
		- Sewer appurtanances
4.		**Hydrology**
		- Transpiration cycle
		- Runoff
		- Watersheds
		- Rainfall intensity
		- Storm frequency

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TOPIC NO.	PERIODS	TOPIC DESCRIPTION
5.	9	Storm Sewer Systems
		- Rational formula
		- Drainage area
		- Runoff coefficient
		- Time of concentration
		- Stormwater detention
6.	3	Road and Street Design
		- Location of services
		- Excavation
		- Backfill materials
		- Curb and gutters
		- Sidewalks

COURSE OBJECTIVES

CIV 110-4

Hydraulics

1. Define pressure.
2. Acquire a working knowledge in both imperial and SI units.
3. Define hydrostatic pressure.
4. Define atmospheric pressure.
5. Calculate pressure at various depths.
6. Define pressure head.
7. Identify ways of measuring pressures.
8. Identify the relationship between flow rate, flow velocity, and flow area.
9. Solve problems using the continuity of flow equation.
10. Identify Bernoulli's equation.
11. Solve problems using Bernoulli's equation.
12. Define hydraulic grade line and head loss.
13. Identify the Hazen-William equation.
14. Solve problems using the Hazen-William equation.
15. Identify Manning's formula.
16. Solve problems for open channel flow.
17. Solve problems for pipe flows.

Water Distribution Systems

1. Recognize domestic water demands, commercial water demands and fire demands.
2. Identify the design period.
3. Identify maximum and minimum operating pressures.
4. Have an understanding of the different pipe materials.
5. Design simple waterworks distribution systems.
6. Solve for distribution pipe size.
7. Identify the different installation factors such as depth of cover, bedding materials, thrust blocks, and compaction requirements.
8. Identify the pressure testing procedure and compute the acceptable leakage levels in a pipe network.

Sanitary Sewer Systems

1. Identify materials used in the construction of sanitary sewers.
2. Identify design periods and tributary areas.
3. Identify minimum and maximum velocities in pipes.
4. Identify minimum sewer slopes.
5. Layout a sanitary sewer system appreciating: Minimum sewer size, depth of cover, sewer location and manhole spacing.
6. Perform calculations for a simple sanitary sewer system.

COURSE OBJECTIVES

CIV 110-4

Hydraulics

1. Outline the basic features of the hydrologic cycle.
2. State the factors affecting a site's runoff coefficients.
3. Sketch a series of storm duration curves.
4. Define rainfall intensities.
5. Define storm reoccurrence, interval and storm frequency.
6. For a given watershed, determine the drainage divide line and list the characteristics that affect the runoff volume.

Storm Sewer Design

1. Identify the rational formula.
2. Perform the runoff computations for a small subdivision.
3. Design sewer flows using Manning's equation.
4. Layout a storm sewer system appreciating: minimum pipe size, depth of cover, manhole spacing and catch basin locations.
5. Identify the treatment of roof and foundation drainage.
6. State the needs for stormwater detention/retention ponds.

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