DOC.# 221

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: MUNICIPAL ADMINISTRATION AND SERVICES

CODE NO.: CIV 110-4 **SEMESTER:** IV

PROGRAM: CIVIL ENGINEERING

AUTHOR: JOHN K. THEIL

DATE: DECEMBER 1991 **PREVIOUS OUTLINE DATED:** SEPTEMBER 1990

APPROVED: L P Chrzuth 92-01-10

DEAN DATE

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COURSE NAME | **COURSE NUMBER**

TOTAL CREDIT HOURS: 45

PREREQUISITE(S): HYD 220 HYDRAULICS

I. PHILOSOPHY/GOALS:

To introduce the basic principles and procedures for the design and construction of water distribution, sanitary sewers, and storm drainage systems. Also, conventional water and wastewater treatment processes are covered.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will be able to:

1) Apply the basic principles of hydraulics and hydrology applicable to water distribution, waste water collection, and storm drainage systems.

2) Prepare system layouts and perform basic designs of water and sewer systems.

3) Select appropriate materials for piping and appurtenances.

4) Identify and apply water quality criteria and treatment requirements for drinking water and wastewater.

5) Describe conventional water and wastewater treatment methods.

6) Perform design computations and determine operational parameters for water and wastewater treatment processes.

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III. TOPICS TO BE COVERED:

	TOPICS	HOURS
1.	Hydraulics and Hydrology Water Pressure Pressure-Velocity-Head Relationships Hydrology of Lakes and Reservoirs	5
2.	Water Distribution System Flow In Pipes Under Pressure Head and Friction Losses Hazen Williams Equation Water Demands System Design	8
3.	Sanitary Sewer System Gravity Flow in Circular Pipes Flow Measurement in Pipes Flow Measurement in Open Channels Design Flows System Design	9
4.	Storm Drainage Amount of Storm Runoff Rainfall Intensity-Duration Curves Design Considerations	6
5.	Water and Wastewater Treatment Drinking Water Objectives Surface Water Treatment Groundwater Treatment Wastewater Treatment Industrial Flows Design Flows	10

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IV. LEARNING ACTIVITIES	REQUIRED RESOURCES
1.0 HYDRAULICS AND HYDROLOGY Upon successful completion of this unit the student will be able to:	Text Chapter 1 pp. 1-5 Chapter 4 pp. 100-101
1.1 Identify flow design parameters 1.2 Perform total energy calculations 1.3 Determine head losses in pipes	Lecture Notes
2.0 WATER DISTRIBUTION SYSTEM Upon successful completion of this unit the student will be able to:	Text Chapter 4 pp. 102-107
2.1 Apply common pipe flow formulae 2.2 Estimate water demands for system design 2.3 Perform system design calculations	Lecture Notes
3.0 SANITARY SEWER SYSTEM Upon successful completion of this unit the student will be able to:	Text Chapter 4 pp. 124-132
3.1 Identify appropriate design parameters 3.2 Determine design flows in pipes using common formulae and nomographs 3.3 Apply formulae for determining flows in pips and open channels 3.4 Determine design flows 3.5 Perform sewer design calculations	Lecture Notes

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IV. LEARNING ACTIVITIES		**REQUIRED RESOURCES**
4.0	STORM DRAINAGE	Text Chapter 4 pp. 132-135
	Upon successful completion this unit the student will be able to:	
4.1	Calculate quantity of runoff for storm sewer design	Lecture Notes
4.2	Identify rainfall intensity-durations relationships	
4.3	Perform storm sewer design calculations	
5.0	WATER AND WASTEWATER TREATMENT	Text Chapter 7 pp. 234-246 Chapter 9 pp. 322-333 Chapter 11 pp. 366-373
	Upon successful completion of this unit the student will be able to:	
5.1	Identify drinking water objectives	Lecture Notes
5.2	Select unit treatment processes for surface and groundwater treatment	
5.3	Identify conventional wastewater treatment processes	
5.4	Determine "Equivalent Population" flows	
5.5	Calculate plant design flows	

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V. METHOD OF EVALUATION:

Assignments/Exercises	20%
Interim Test	25%
Final Examination	55%

Grading:

A+ = 90 - 100%
A = 80 - 89%
B = 70 - 79%
C = 60 - 69%

A passing grade will be based on a minimum composite grading of 60%. Students obtaining a composite grading of 55 to 59% may be allowed to complete a supplementary examination.

VI. REQUIRED STUDENT RESOURCES:

TEXTBOOK(S):

Hammer, Mark J.; Water and Wastewater Technology, Second Edition; John Wiley and Sons.

VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY BOOK SECTION:

REFERENCES:

Ministry of the Environment; Guidelines For the Design of Water Storage Facilities, Water Distribution Systems, Sanitary Sewage Systems and Storm Sewers; Government Bookstore, 880 Bay Street, Toronto

VIII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.