SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE:	WATER SUPPLIES & TREATMENT		
CODE NO.	WTR 201-4	SEMESTERS:	IV & VI
PROGRAM:	WATER RESOURCES/PULP & PAPER ENGINEERING TECHNOLOGY		
AUTHOR:	JOHN K. THEIL		
DATE:	NOVEMBER 1989	PREVIOUS OUTLINE DATED:	MAY 1989

APPROVED: CHAIR:PEi^SON DATE May /i//ea

WATER SUPPLIES & TREATMENT WTR 201-4

COURSE NAME CODE NO.

TOTAL CREDIT HOURS 75

PREREwUISITE(S): WTR330

I. PHYLOSOPHY/GOALS:

To present basic knowledge and practices, theories and applications relevant to sources of water supplies, treatment processes, quality parameters and plant operations.

II STUDENT PERFORMANCE OBJECTIVES:

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

1. Evaulate various bacterial and physiochemical characteristics of water as parameters of water quality.

2. Apply drinking water standards.

3. Identify and evaluate various unit operations (physical, chemical and biological) commonly used in the treatment of water.

4. Perform design computations needed and determine operational parameters used in process control.

5. Perform laboratory analyses for turbidity, colour, pH, alkalinity, coagulent effectiveness, chlorine and flouride residual, hardness, iron, manganese, and total dissolved solids.

6. Conduct plant operations including preparation of chemical solutions, determination of dosage rates, selection of points of application, and backwashing.

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III. TOPICS TO BE COVERED:

TOPIC	NO. OF WEEKS
Water quality and standards	
1.1 Bacteriological characteristics	
1.2 Bacteria testing procedure	
1.3 Physical and Chemical characteristics	
1.4 Drinking water standards	
Water Processing	11
2.1 Introduction to water supply systems	
2.2 Sources of water supplies	
2.3 Unit operations of water treatment	
2.4 Surface water and ground water treatment systems	
2.5 Disposal of waste from water treatment processes	
2.6 Mixing and flocculation	
2.7 Chemical feeders	
2.8 Sedimentation, clarifiers	
2.9 Filtration	
2.10 Iron ana manganese removal	
2.11 Hardness removal	
2.12 Chlorination	
2.13 Flouridation	
2.14 Turbidity and odour control	
2.15 Removal of dissolved salts	
2.16 Corrosion control and stabilization	
Operation of water treatment, plant and distribution	
3.1 Groundwater treatment plant	
3.2 River water treatment plant	
3.3 Water quality control	
3.4 Water distribution maintenance and surveillance	
3.5 Water rates	

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IV. METHOD OF ASSESSMENT:

Laboratory Work/Assignments	30%
Interim Examinations (2 @ 20%)	40%
Final Examination	30%

Grading;

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

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

V. REQUIRED STUDENT RESOURCES:

Textbooks:

Hammer, Mark J. Water and Wastewater Technology (SI Version),2nd Edition, John Wiley and Sons, Toronto, 1977.

Ministry of the Environment, Laboratory Skills for Plant Operators, Vol. 2, 135 St. Clair Avenue West, Toronto, Ontario.

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

Fair, Gordon Maskey, Geyer, John C, Elements of Water Supply and Wastewater Disposal, 2nd edition, John Wiley and Sons, Toronto, 1971.

Viessman, W. Jr., Hammer, M. J., Water Supply and Pollution Control, **4th** edition. Harper and Row Publishers, **New** York, 1985.

Tchobanoglous, G., E.D. Schroeder, Water Quality, Addison-Wesley Publishing Company, Don Mills, Ontario, 1985.

Peavy, H.S., D.R. Donald, G. Tchobanogluns, Environmental Engineering, McGraw Hill Book Company, Toronto, 1985.

TAPPI, Water Supply and Treatment, State-of-the-Art, Technical Association of the Pulp and Paper Industry, One Dunwoody Park, Atlanta, GA, 30338, 1978