

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title WATER SUPPLIES & TREATMENT

Code No. : WTR 201-4

Program; WATER RESOURCES/PULP & PAPER ENGINEERING TECHNOLOGY

Semester IV

Date: 86 05 07

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New;

Revision:

APPROVED:

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Date

WATER RESOURCES
WTR 201-4
WATER SUPPLIES & TREATMENT

WATER SUPPLIES & TREATMENT

WTR 201-4

Course Name

Course Number

OBJECTIVES:

1. Understand the need for the production of highest quality of water.
2. Understand the various types of bacterial and physiochemical characteristics of water as parameters of water quality.
3. Appreciate the sources of water for water supply.
4. Know about the various unit operations (physical, chemical and biological) commonly used in the water treatment systems.
5. Know the role of plant operator in maintaining the quality of water under different situations under both normal and abnormal situations.
6. Be familiar with various treatment processes and systems. Design criteria/procedures for flocculation and sedimentation tanks, filters and chemical feeding equipment.
7. Develop skills for making fast and accurate computations needed for design as well as day-to-day operation of the plant.
8. Determine laboratory techniques for the turbidity, colour, pH, alkalinity, coagulant effectiveness, chlorine and flouride residual, hardness, iron, manganese and total dissolved solids.
9. Know the operation of a water treatment plant.
 - a. Prepare chemical solutions for dosage rate selected based on jar test and other studies.
 - b. Calculate feed rate for a selected flow rate and adjust feed pump to yield the required output.
 - c. Observe colour turbidity, pH, chlorine residual and hardness of raw and finished water.
 - d. Operate different controls, including backwashing of the filter.

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

EVALUATION; BASIS OF FINAL MARK

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| Assignment - Problems and Laboratory/Field Exercises | 25% |
| Mid-Term Examination | 25% |
| Final Examination | 50% |

- NOTE:
1. Late submissions will be penalized.
 2. The above distribution of marks is subjected to change.
 3. A passing grade will be based on a composite grading of 60%. Students obtaining a composite grading of 55-60% may be allowed a supplementary examination.

TEXTBOOK;

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

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

REFERENCES;

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.

WATER RESOURCES
WTR 201-4
WATER SUPPLIES & TREATMENT

COURSE OUTLINE:

Water quality and pollution, water processing, sedimentation, filtration, chemical treatments, softening and desalination, chlorination, flouridation, operation of water works.

| TOPIC | NO. OF WEEKS |
|---|--------------|
| 1. Water quality and pollution | 2 |
| 1.1 Bacteriological characteristics | |
| 1.2 Bacteria testing procedure | |
| 1.3 Physical and Chemical characteristics | |
| 1.4 Other chemical considerations | |
| 2. Water Processing | 12 |
| 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 and 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 | |
| 3. Operation of water treatment, plant and distribution | 2 |
| 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 | |