

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title;           HYDRAULICS  
Code Ho. :             HYD 220-5  
Program:               WATER RESOURCES/PULP and PAPER  
Semester:             FALL -1-  
Date:                  SEPTEMBER, 1983  
Author:                S. C. VERMA

New:

Revision:

APPROVED: \_\_\_\_\_  
                  Chairperson

Date

HYDRAULICS  
Course Name

HYP 220-5  
Course Number

PHILOSOPHY/GOALS:

To introduce this basic principles of fluid mechanics and the application of these principles to practical and applied problems. After completing this course the student should have a firm foundation in the field to continue learning. This course will provide the understanding of basic concepts of fluid mechanics and application of these concepts to solve practical problems in the area of specialization. •

METHOD OF ASSESSMENT (GRADING METHOD):

Problem assignment & Laboratory reports	25%
Mid-term examination	25%
Final examination	50%

To pass this course a minimum of 55% is required in the weighted average provided a pass grade is obtained in at least one of the tests.

TEXTBOOK(S):

Mott, Robert, Applied Fluid Mechanics, Second Edition,  
Charles E.Merrill Publishing Company, Toronto

## COURSE OUTLINE

1. Introduction, units and calculations
2. Properties of fluids
3. Fluid pressure and its measurement
  - fluid pressure
  - absolute and gauge pressure
  - relationship between pressure and elevation
  - manometers, barometers and pressure gauges
4. Fundamentals of fluid flow
  - types of flows
  - continuity equation
  - energy and head
  - Bernoulli's equation
  - applications of Bernoulli's equation
  - energy loss and gain
  - general energy equation
  - application of general energy equation
5. Fluid measurements
  - general methods of local velocity measurements
  - orifices, nozzles and tubes
  - - weirs
  - other methods
6. Steady compressible flow in pressure conduits
  - laminar and turbulent flow
  - friction formulas
  - energy gradient and hydraulic gradient
  - minor losses
  - solution of pipe flow problems
7. Pumping systems
  - parameters involved in pump selection
  - types of pumps
  - static head and dynamic head
8. Steady uniform flow in open channels
  - open channel flow defined
  - equations of uniform flow
  - efficient cross-section
  - specific energy and critical flow
  - hydraulic pump