SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: HYDROLOGY
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Code No.: HYD 110-5
_____

Program: WATER RESOURCES
_____

Semester: FALL
_____

Date: SEPTEMBER, 1984
_____

Author: S.C. VERMA
_____

New: _____    Revision: __X_____

APPROVED: _____    _____
          Chairperson                            Date

| HYDROLOGY | HYD 110-5 |
|---|---|
| Course Name | Course Number |

**PREREQUISITE:**  HYD 100

**PHILOSOPHY/GOALS:**

Recognize and identify the processes in the hydrologic cycle which are important for a variety of watersheds and watershed conditions.  Measurement and instruments required for common hydrological problems both from quantity as well as quality point of view.  Basic calculation/computation techniques, including simple deterministic modelling and stochastic analysis for the solution of common hydrological problems.

On the completion of the course, the student should be able to:

- Do measurement and estimation of hydrologic components including precipitation, evaporation, transpiration and infiltration.

- Do the volume balance for simplified hydrologic systems.

- Measure the quantities like stream flow velocity, elevation, precipitation and water levels and operation related hydrological equipment. Maintain a field book, interpret and analyze the data.

- To apply the principles of statistics to the historical data to make forecast about events including floods and droughts.

- Apply principles of hydrology to the prediction of precipitation and the calculation of peak runoff both for urban and rural watersheds.

- To develop unit hydrographs for small watersheds using the observed stream flow data or based on other watershed characteristics.

- Apply the principles of hydraulics and hydology in routing the flood wave and understanding of flood control measures.


**METHOD OF ASSESSMENT AND EVALUATION:**

The final mark will be assigned which is higher of either
a) final examination
b) weighted mark calculated as follows:

| | |
|---|---|
| Laboratory Exercises & Assignment Problems | 25% |
| Midterm Examination | 25% |
| Final Examination | 50% |

METHOD OF ASSESSMENT AND EVALUATION - Continued

- Eighty percent attendance is required for anyone to be considered for supplementary examination.

- Homework assigned is due after one week. Late submissions will be penalized.

- To pass the course, a student at least must secure 55% in one of the tests.

- This is subjected to any changes.


TEXTBOOK(S):

Hammer, Mark J. and K.A. Mackichan (1981). Hydrology and Quality of Water Resources, John Wiley and Sons, Inc., Toronto.


REFERENCES:

Viessman, Warren Jr., J.W. Knapp and G.L. Lewis (1977). Introduction to Hydrology, 2nd Edition, Harper and Row Publishers, New York.

Linsley, R.K. Jr., M.A. Kohler and J.L.H. Paulhus (1982). Hydrology for Engineers, 3rd Edition, McGraw-Hill Book Company, Toronto.

Gray, D.M. (Editor-in-Chief) (1970). Handbook on the Principles of Hydrology, Water Information Center, Inc., Huntington, New York.

1.  Introduction:                                                                                   (2)

    - hydrologic cycle
    - water quantity
    - water quality
    - continuity equation
    - horologic budget equation

2.  Precipitation                                                                                   (2)

    - measurement of rain and snow
    - analytical methods for computing averages
    - areal variation
    - time variability of precipitation at a point
    - maximum mean rain depth area curve
    - rainfall intensity duration frequency curve

3.  Hydrologic Abstractions                                                                         (2)

    - evaporation
    - transpiration, evapotranspiration
    - interception, depression storage
    - infiltration
    - estimation and measurement

4.  Stochastic Hydrology                                                                            (2)

    - probability approach to the analysis of hydrologic problems
    - probability distribution of hydrologic data
    - flood frequency analysis

5.  Stream Flow                                                                                     (2)

    - stream gauging stations
    - measuring stream flow by current metering
    - determining stream flow by indirect methods
    - stream flow records

6.  Rainfall-Runoff Relationships                                                                   (4)

    - factors affecting runoff
    - components of a hydrograph
    - hydrograph analysis
    - peak flow runoff rates
    - unit hydrograph
    - synthetic hydrograph
    - flood routing
    - control of floods

7. Hydrology of Impounded Water                                           (1)

   - construction of reservoirs
   - reservoir yield
   - thermal stratification

8. Water Resources Management                                             (1)

   - water quality management
   - water quantity management