**Course Number: CEng3154**

**Course Title: Engineering Hydrology**

**Degree Program B.Sc. in Civil Engineering**

**Module: Engineering Hydrology & Hydraulics**

**Pre-requisites: CEng2151, Hydraulics II**

**Course Objectives**

* Understand how observations of the hydrologic cycle are made and how they can be appropriately used.
* Understand how to predict risks and reliabilities of flood control systems.

**Course outline**

1. **Introduction**
2. **Rainfall-Runoff Relationships** 
   1. Introduction
   2. Rational Method
   3. SCS Curve Number Method
   4. Time-Area Method
   5. Stream Flow Hydrograph
   6. The Unit Hydrograph (Uh)
3. **Flood Routing**
   1. General
   2. Simple Non-Storage Routing
   3. Storage Routing
   4. Channel Routing
4. **Frequency Analysis** 
   1. General
   2. Flow Frequency
   3. Flood Probability
   4. Regional Frequency Analysis
   5. Low Flow Analysis
   6. Precipitation Probability
   7. Risk, Reliability and Safety Factor
5. **Stochastic Hydrology**
   1. Introduction.
   2. Time Series
   3. Properties of Time Series
   4. Analysis of Hydrologic Time Series
   5. Time Series Synthesis
   6. Some Stochastic Models
   7. The Uses of Stochastic Models
6. **Reservoir Capacity Determination**
   1. Mass Curve (Ripple's) Method:
   2. Reservoirs and Sediments
   3. Sediment Load Prediction
7. **Urban Hydrology**
   1. Catchment Response Modifications
   2. Urban Development Planning
   3. Drainage Design

**Mode of delivery**

* Lectures, tutorials, exercises

**Mode of assessment**

* Continuous Assessment 60%
* Final Examination 40%

**Literature**

* Hydrology principles, analysis and design, by H.M Raghunath, 1995
* Elizabeth M. Shaw (1994), Hydrology in practice, 3rd edition
* Ray K. Linseley, JR etal, (1982), Hydrology for Engineers, 3rd edition
* Stochastic Hydrology, Dr. P. Jayarami Reddy 1997, New Delhi
* Flood frequency analysis, A. Ramachandra Rao, Kaled H. Hamed
* Engineering hydrology, Second edition, K Subramanaya
* Ven Te Chow and Maidment (1988). Engineering Hydrology. McGraw-Hill.