INSTITUTE	**FACULTY OF TECHNOLOGY**
PROGRAM	**BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)**
SEMESTER	**5**
COURSE TITLE	**HYDROLOGY AND WATER RESOURCE MANAGEMENT**
COURSE CODE	**01CI1501**
COURSE CREDITS	**2**

Objective:

1 To impart the methodology for estimation of peak floods
2 To demonstrate the process for measurement of precipitation, infiltration, Evaporation
3 To understand of construction of hydrograph, unit hydrograph and S-Hydrograph
4 To impart the methodology for estimation of peak floods.
5 To introduce flood management techniques.

Course Outcomes: After completion of this course, student will be able to:

1 Calculate average rainfall over a drainage basin using Isohyet method
2 Determine rate of evaporation of the water and rate infiltration of the soil using suitable methods.
3 Obtain the runoff from a catchment using unit hydrograph.
4 Compute the discharge from bore well using Dupuit and Thiem theory
5 Estimate the highest flood flow in the river using flood frequency analysis method

Pre-requisite of course:..

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Hydrology** Precipitation: Forms, type & formation of precipitation, measurement of rainfall, interpretation of rainfall data, estimating missing data, double mass curve, average rainfall over area, Evaporation: Evaporation and its Measurement, Infiltration: factors affecting infiltration and its measurement, Stream flow: its measurement & Data telemetry	7

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Contents : Unit	Topics	Contact Hours
2	**Hyetograph and Hydrograph Analysis** Introduction and construction of hydrograph, Water shed characteristic, factors affecting runoff, Hydrograph perception, its components, Factors affecting hydrograph assumptions and limitation of unit hydrograph, Derivation of unit hydrograph and application of Unit Hydrograph, S-hydrograph and its application, Flow duration curve	7
3	**Ground Water hydrology** Groundwater formation and occurrence, Types of aquifers, aquifer parameter, Ground Water movement –Darcy's Law, Well Hydraulics, Well losses, yield of well, constant level pumping test and Recuperation Test	5
4	**Flood Management** Historical flood in Indian Rivers, Causes of floods, Flood mitigation measure, flood damage analysis	2
5	**Hydrologic Data Analysis** Flood estimation method, Design flood, Flood Frequency Analysis, Flood routing through reservoir and channel routing, Types of Hydrological Simulation model	7
Total Hours		**28**

Textbook :

1 Hydrology and Water Resources Engineering; Vol. I, S. K. Garg, Khanna Publishers, 2020

References:

1 Engineering Hydrology, Engineering Hydrology, K. Subramanya, Tata McGraw Hill Pub. Co. New Delhi, 2019

2 Applied Hydrology, Applied Hydrology, Ven Te Chow, D.R. Maidment and L.W Mays, McGraw Hill International Edition, New York, 2018

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery

Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
10.00	25.00	40.00	15.00	10.00	0.00

Instructional Method:

1 Prerequisite of the course and its pattern shall be discussed on the commencement of the course

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Instructional Method:

2 Lectures shall be conducted in class room using various teaching aids

3 Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation

4 At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work

5 The demonstrate the process of measuring the hydrological parameters that it covers the practical aspects of the course contents. It shall bring the clarity of the theoretical concepts among the students during the academic sessions

Supplementary Resources:

1 https://archive.nptel.ac.in/courses/105/101/105101215/

2 https://onlinecourses.nptel.ac.in/noc22_ce45/preview

3 https://archive.nptel.ac.in/courses/105/105/105105110/

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