

# Engineering Hydrology

<b>Course Code</b> CE-358	<b>Credit Hours</b> 2-1
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## Course Description

This course introduces to the students the principles of hydrology, including the hydrological cycle and its impact on water resources availability, catchment water balance, measurement of catchment rainfall and its analysis, measurement of flow in natural rivers and channels.

## Text Book:

1. Ghuman, A. R. (2006) Engineering Hydrology: An Introduction. Prosperous Pakistan Publishers, Lahore, Pakistan.

## Reference Book:

1. Raghunath, H.M. (1988). Hydrology: Principles, Analysis & Design, Wiley Eastern, India.
2. Punmia, B.C. (1984). Irrigation & Water Power Engineering, Standard Publishers Distributors, New Dehli, India
3. Sharma R.K. A Textbook of Water Power Engineering--Including Dams Engineering, Hydrology and Fluid Power Engineering - S. Chand and Company Ltd, New Delhi
4. Linsley R K, Kohler M A, and Paulhus L H (1988) Hydrology For Engineers, McGraw Hill, Paperback - 1988, ISBN
5. Bedient P B, Huber W C & Vieux B E (2012), Hydrology and Floodplain Analysis (5th Ed.), Pearson, 2007
6. Chow V T, Maidment D R and Mays L W (1988). Applied Hydrology, McGraw-Hill.

## Prerequisites :

Nil.

### ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

### ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assesment/ Viva	20%

### Teaching Plan

Week No	Topics/Learning Outcomes
1	Introduction to Engineering Hydrology and its Significance
2 – 3	Hydrological Cycle and Equation
4 – 6	Precipitation
7	Evapotranspiration
8	Runoff
9	<b>Mid Semester Exam</b>
10	Stream Gauging
11 – 13	Hydrograph
14 – 15	Flood Routing
16	Artificial Intelligence in Engineering Hydrology
17-18	<b>End Semester Exam</b>

### Practical

Experiment No	Description
1-5	Effect of Various Conditions of the Catchment Area and its Slope on the Rainfall-Runoff Relationships: <ol style="list-style-type: none"> <li>a. Long duration storm (<math>t_r &gt; t_c</math>) on dry catchment</li> <li>b. Short duration storm (<math>t_r &lt; t_c</math>) on dry catchment</li> <li>c. Short duration storm (<math>t_r &lt; t_c</math>) on saturated catchment</li> <li>d. Short duration storm (<math>t_r &lt; t_c</math>) on impermeable catchment</li> </ol> Effect of catchment slopes on runoff hydrograph

6	Infiltration Measurement using Single Ring Infiltrometer
7	Infiltration Measurement using Double Ring Infiltrometer
8	OEL: Flood wave arrival time computation in lab flume
9	Measurement of Pan Evaporation
10	Effect of Multiple Storms on the Runoff Hydrograph
11	HEC-HMS: Getting Familiar with the Software