SARDAR RAJA COLLEGES

SARDAR RAJA COLLEGE OF ENGINEERING, ALANGULAM

DEPARTMENT OF CIVIL ENGINEERING

MICRO LESSON PLAN

SUBJECT : HYDROLOGY

CODE : CE2021

CLASS : III Year / VI SEM

STAFF: Prof.V.TAMILARASI,

DEPT. OF CIVIL ENGG

CE 2021 HYDROLOGY L T P C

OBJECTIVE 3 0 0 3

At the end of the semester, the student shall be having a good understanding of all the Components of the hydrological cycle. The mechanics of rainfall, it's spatial and temporal Measurement and their applications will be understood. Simple statistical analysis and application of probability distribution of rainfall and run off shall also be understood. Student will also learn simple methods of flood routing and ground water hydrology.

UNIT I PRECIPITATION 9

Hydrologic cycle – Types of precipitation – Forms of precipitation – Measurement of Rainfall – Spatial measurement methods – Temporal measurement methods – Frequency analysis of point rainfall – Intensity, duration, frequency relationship – Probable maximum precipitation.

UNIT II ABSTRACTION FROM PRECIPITATION 9

Losses from precipitation – Evaporation process – Reservoir evaporation – Infiltration process – Infiltration capacity – Measurement of infiltration – Infiltration indices – Effective rainfall.

UNIT III HYDROGRAPHS 9

Factors affecting Hydrograph – Baseflow separation – Unit hydrograph – Derivation of unit hydrograph – S curve hydrograph – Unit hydrograph of different deviations - Synthetic Unit Hydrograph

UNIT IV FLOODS AND FLOOD ROUTING 9

Flood frequency studies – Recurrence interval – Gumbel's method – Flood routing – Reservoir flood routing – Muskingum's Channel Routing – Flood control

UNIT V GROUND WATER HYDROLOGY 9

Types of aquifers – Darcy's law – Dupuit's assumptions – Confined Aquifer – Unconfined Aquifer – Recuperation test – Transmissibility – Specific capacity – Pumping test – Steady flow analysis only.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Subramanya, K., "Engineering Hydrology", Tata McGraw-Hill Publishing Co., Ltd., 2000
2. Raghunath, H.M., "Hydrology", Wiley Eastern Ltd., 2000

REFERENCES:

1. Chow, V.T. and Maidment, "Hydrology for Engineers", McGraw-Hill Inc., Ltd., 2000
2. Singh, V.P., "Hydrology", McGraw-Hill Inc., Ltd., 2000.

SUBJECT DESCRIPTION

Hydrology provides the disciplinary foundations for working on water resources problems. The course develops the technical skills to quantify all aspects of the hydrological cycle. Each component of the water cycle is covered through lectures and a suite of exercises. An understanding of physical hydrologic processes is provided, including the ability to critically analyze and apply that understanding to new problems. Students completing the course will have a good background for further work on water management, including such topics such as integrated water resources management, urban water management, flood control, managing climate change impacts on the water cycle, water supply, contaminated sites management etc.

OBJECTIVE

A student who has met the objectives of the course will be able to:

- Describe the governing processes of the hydrologic cycle including exchange processes between atmosphere and soil surface, surface water runoff, and groundwater flow
- Be able to formulate hydrological processes in mathematical terms
- Solve problems related to water resources development
  Including groundwater and surface water
- Be able to integrate components of the hydrological cycle in a water resource assessment
- Be able to work with and recognize the limitations of hydrological data.
- To employ physical principles such as conservation of mass, energy or force balances to solve problems.
- To describe and solve problems on transport phenomena and be able to employ mathematical and computational techniques

MICRO LESSON PLAN

NO.OF HOURS	TOPICS	REFERENCES
	UNIT I PRECIPITATION	
1	Hydrologic cycle	T-1
2	Types of precipitation	T-1
3	Forms of precipitation	T-1
4	Measurement of rain fall	T-1
5	Spatial measurement method	T-1
6	Temporal measurement method	T-1
7	Frequency analysis of point rain fall	T-1
8	Intensity, duration, frequency relationship	T-1
9	Probable maximum precipitation	T-1
	UNIT II ABSTRACTION FROM PRECIPITATION	
10	Losses from precipitation	T-1
11	Evaporation process	T-1
12	Reservoir evaporation	T-1
13	Infiltration process	T-1
14	Infiltration capacity	T-1
15	Measurement of Infiltration (Flooding type Infiltration)	T-1
16	Measurement of Infiltration (Double ring type Infiltration)	T-1
17	Infiltration indices	T-1
18	Effective rainfall	T-1
	UNIT III HYDROGRAPHS	
19	Factors affecting hydrograph	T-1
20	Base flow separation	T-1
21	Unit hydrograph	T-1
22	Derivation of unit hydrograph	T-1
23	S Curve hydrograph	T-1
24	Unit hydrograph of different deviations	T-1
25	Synthetic unit hydrograph	T-1
26	Problems	T-1
27	Problems	T-1

UNIT IV FLOODS AND FLOOD ROUTING		
28	Flood routing studies	T-1
29	Recurrence interval	T-1
30	Gumbel's method	T-1
31	Flood routing	T-1
32	Reservoir flood routing	T-1
33	Muskingum's channel routing	T-1
34	Flood routing control	T-1
35	Problems	T-1
36	Problems	T-1
UNIT V GROUND WATER HYDROLOGY		
37	Types of aquifers	T-1
38	Darcy's law	T-1
39	Dupuit's assumption	T-1
40	Confined aquifer, unconfined aquifer	T-1
41	Recuperation test	T-1
42	Transmissibility	T-1
43	Specific capacity	T-1
44	Pumping test	T-1
45	Steady flow analysis	T-1