Devi Ahilya University Indore, India Institute of Engineering & Technology				II B.E. (Civil Engineering) (Full Time)			
Subject Code and Name	Instruction Hours			Credits			
VLR5G3: Water Resources Engineering	L	T	P	L	T	P	Total
Duration of Theory Paper: 3 hours	3	1	-	3	1	-	4

Learning Objectives:

To enhance the knowledge on the subject Water Resources Engineering.

COURSE CONTENTS

Unit – I

Irrigation Water Requirement and Soil-Water-Crop Relationship: Irrigation, definition, necessity, advantages and disadvantages, types and methods, Irrigation development.

Soils - Types and their occurrence, suitability for irrigation purposes, wilting coefficient and field capacity, optimum water supply, consumptive use and its determination. Irrigation methods surface and subsurface, sprinkler and drip irrigation.

Duty of water, factors affecting duty and methods to improve duty, suitability of water for irrigation, crops and crop seasons, principal crops and their water requirement, crop ratio and crop rotation, intensity of irrigation.

Unit – II

Ground Water and Well Irrigation: Confined and unconfined aquifers, aquifer properties, hydraulics of wells under steady flow conditions, infiltration galleries. Ground water recharge, necessity and methods of improving ground water storage.

Water logging- causes, effects and its prevention. Salt efflorescence causes and effects. Reclamation of water logged and salt affected lands.

Type of wells, well construction, yield tests, specific capacity and specific yield, advantages and disadvantages of well irrigation.

Unit-III

Hydrology : Hydrological cycle, precipitation and its measurement, recording and non recording rain gauges, estimating missing rainfall data, rain gauge net works, mean depth of precipitation over a drainage area, mass rainfall curves, intensity-duration curves, depth-area duration curves,

Infiltration and infiltration indices, evaporation stream gauging, run off and its estimation, hydrograph analysis, unit hydrograph and its derivation from isolated and complex storms, S-curve hydrograph, synthetic unit hydrograph.

Unit – IV

Canals and Structures: Types of canals, alignment, design of unlined and lined canals, Kennedy's and Lacey's silt theories, typical canal sections, canal losses, lining-objectives, materials used, economics. Introductions to Hydraulic Structures viz. Dams, Spillways, Weirs, Barrages, Canal Regulation Structures.

Unit-V

Floods : Types of floods and their estimation by different methods, probability and frequency analysis, flood routing through reservoirs and channels, flood control measures, economics of flood control,

Suggested Books:-

1. Irrigation & Water Power Engg. by Punmia & Pandey B.B.Lal
2. Engg. Hydrology by K. Subhramanya - Tata Mc Graw Hills Publ. Co.
3. Engg. Hydrology - J.NEMEC - Prentice Hall
4. Hydrology for Engineers Linsley, Kohler, Paulnus - Tata Mc.Graw Hill.
5. Hydrology & Flood Control by Santosh Kumar - Khanna Publishers
6. Engg. Hydrology by H.M. Raghunath G