GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 1

Water Resources Management

Subject Name Water Resources Engineering

Sr.No	Course content
1	Introduction: The hydrologic cycle, importance of water resources
2	Precipitation**:** Types of precipitation, geographical distribution, time distribution, variability, measurement, average depth over area, depth area duration
3	Evaporation and Transpiration**:** Factor affecting, measurement, evaporation in reservoirs, methods of prevention
4	Infiltration: Introduction, factor affecting, measurement
5	Runoff **:** Runoff process; relation of storm period and rainfall, factors affecting runoff methods of computation; gauging runoff of stream; stage discharge relationships interpretation of stream flow records
6	Hydrograph Analysis**:** Components of the hydrograph; Separation of base flow, components unit hydrographs, S-hydrographs
7	Floods: Causes of floods, methods of estimation of floods. Design floods, damages, flood routing through reservoirs, methods of flood control, flood forecasting and warning
8	Groundwater Hydrology**:** Occurrence and movement of groundwater, surface and subsurface investigation of groundwater, flow through saturated porous medium

List of Tutorials:

1. Water resources and their characteristics
2. Geographical distribution and finding average precipitation
3. Horton's equation on infiltration
4. Example based on unit hydrograph method
5. S-curve hydrograph and synthetic hydrograph
6. Flood routing methods, ground water flow in steady and unsteady condition
7. Explain Darcy's law

Reference Books:

1. Hydrology and Water Resources Engineering by S. K. Garg
2. Watershed Hydrology by Peter E. Black
3. Engineering Hydrology - K. Subramanya
4. Hydrology by H. M. Raghunath
5. Hydrology and Water Resources Engineering by James & Lee