(PEC-CVE462-T) Groundwater Engineering			
Week	**Lecture No.**	**Topic**	**Remarks**
1	1	Introduction to Groundwater Hydrology	
	2	Occurrence and Distribution of Groundwater	
	3	The Hydrologic Cycle and Groundwater's Role	
2	4	Mechanical Energy and Fluid Potential	
	5	Hydraulic Head and its Measurement	
	6	Darcy's Law: Fundamentals and Limitations	
3	7	Heterogeneity and Anisotropy of Aquifers	
	8	Types of Aquifers: Confined, Unconfined, and Leaky	
	9	Aquifer Properties: Porosity, Permeability, Transmissivity	
4	10	Storage Properties: Specific Storage, Storativity	
	11	Groundwater Flow Equation (Governing Equation)	
	12	Analytical Solutions for Steady Groundwater Flow	
5	13	Steady Flow in Confined Aquifers	
	14	Steady Flow in Unconfined Aquifers	
	15	Graphical Methods for Groundwater Flow	
6	16	Flow Nets: Construction and Interpretation	
	17	Refraction of Flow Lines	
	18	Introduction to Well Hydraulics	
7	19	Minor Test	
	20		
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8	22	Drawdown Due to Well Abstraction	
	23	Steady-State Well Abstraction	
	24	Unsteady-State Well Abstraction (Theis Equation)	
9	25	Well Interference and its Effects	
	26	Pumping Test Analysis: Interpretation and Applications	
	27	Infiltration Wells and Galleries	
10	28	Shallow Well Construction Methods	
	29	Deep Well Construction Methods	
	30	Well Logging and Interpretation	
11	31	Well Completion and Development	
	32	Horizontal Wells: Advantages and Applications	
	33	Regional Groundwater Budget	
12	34	Groundwater Resource Assessment	
	35	Estimation of Groundwater Recharge	
	36	Artificial Recharge Techniques	
13	37	Groundwater Quality: Indian and International Standards	
	38	Groundwater Pollution Sources	
	39	Contaminant Transport: Advection, Dispersion, and Sorption	
14	40	Minor Test	
	41		
	42		
15	43	Remedial and Preventive Measures for Groundwater Contamination	
	44	Geophysical Exploration: Electrical Resistivity Method, Seismic Refraction Method and Saline Water Intrusion	
	45	Groundwater levels fluctuation	