

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: I Environmental Management

Subject Name : Groundwater Hydrology and Contamination

Sr.No	Course content
1.	Introduction: Definition of ground water, aquifers, vertical distribution of subsurface water, hydrological properties of water bearing strata, ground water in hydrologic cycle.
2.	Ground water hydraulics: Darcy's law, its range of validity, Dupuit Forchheimer assumptions, Applications of Darcy's law for simple flow systems, Governing differential equations for confined and unconfined aquifers, Steady and unsteady flow solutions for fully penetrating wells, partially penetrating wells, interference of wells, test pumping analysis with steady and unsteady flows, delayed yield, method of images,
3.	Ground water quality: Indian and international standards
4.	Ground water pollution: Sources, remedial and preventive measures
5.	Ground water conservation: Ground water budget, seepage from surface water, artificial recharge
6.	Models for Groundwater Flow, Sampling and Monitoring Methods, Transport Mechanisms, Modeling Advective-Dispersive Transport, Adsorption and Chemical Reaction, Biodegradation Kinetics, Numerical Flow and Transport Modeling, Waste Site Characterization/Investigation, Ground Water Remediation, Legal Issues in Groundwater Contamination Appendices.

Term work:

Term work will comprise of assignments on the questions related to definition of terms used in ground water hydrology, ground water contamination, methods of treatment of contaminated ground water and numericals on Darcy's law, Dupuit law for yield.

Reference Books:

1. Ground Water : by Raghunath
2. Ground Water Hydrology: By D K Todd
3. Groundwater Resources Education by W C Walton
4. Numerical Ground Water Hydrology by Roger Diewest.
5. Ground water hydrology and contamination by Nicholas Cheremenisoff