

Course Number and Name											
BCE075 - GROUND WATER ENGINEERING											
Credits and Contact Hours											
3 & 45											
Course Coordinator's Name											
Dr A.Mani											
Text Books and References											
TEXT BOOKS:											
<ul style="list-style-type: none"> Reghunath H.M. "Ground Water Hydrology", Wiley Eastern Ltd., Second reprint, 2000. 											
REFERENCES:											
<ul style="list-style-type: none"> Tood D.K,"Ground Water Hydrology", Johnand Sons, 2000. Ramakrishnan S,"Ground Water Groundwater",,Ramakrishnan Publication,Chennai 1998. William C Walton, "Ground Water Resource Evaluation", McGraw Hill New York 1970. 											
Course Description											
<ul style="list-style-type: none"> To introduce the student to the principles of Groundwater governing Equations and Characteristics of different aquifers, To understand the techniques of development and management of groundwater. 											
Prerequisites						Co-requisites					
Irrigation Engineering						NIL					
required, elective, or selected elective (as per Table 5-1)											
Course Outcomes (COs)											
CO1	To learn about the basics of ground water Engineering including the hydrogeological cycle and water level fluctuations										
CO2	To learn about the basics of hydrology of ground water and to make a clear understanding of ground water flow equations of velocity equations.										
CO3	To study the basics of unsteady flow and various methods unsteady flow.										
CO4	To know about the various sources of ground water like collector wells, infiltration galleries.										
CO5	To study about the ground water quality chemistry its origin and water quality standards.										
Student Outcomes (SOs) from Criterion 3 covered by this Course											
COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1	H			M						L	
CO2						H		L			M
CO3				H					M		
CO4						M			H	L	

	CO5					M							
List of Topics Covered													
UNIT I FUNDAMENTALS OF GROUND WATER												9	
Introduction – Characteristics of Ground water – Global distribution of water – ground water column- Permeability- Darcy’s Law, laboratory permeability test Types of aquifers. Hydro geological Cycle, water level fluctuations.													
UNIT II HYDRAULICS OF FLOW												9	
Storage coefficient, Specific yield, Heterogeneity and Anisotropy Transmissivity – governing equations of ground water flow – Steady state flow – Dupuit Forchheimer assumption. Velocity potential flow nets.													
UNIT III ESTIMATION OF PARAMETERS												9	
Transmissivity and Storativity Pumping test - Unsteady state flow- Thies method- Jacob methods - Image well theory - Effect of partial penetrations of well – collectors wells.													
UNIT IV GROUND WATER DEVELOPMENT												9	
Collector wells – infiltration gallery – Conjunctive use – Artificial recharge – Safe yield – Yield test – Geophysical method – Selection of pumps.													
UNIT V WATER QUALITY												9	
Ground water chemistry – origin, movement and quality – water quality standards – salt water intrusion – Environmental concern.													