



C. U. SHAH UNIVERSITY – Wadhwan City

FACULTY OF: -Technology and Engineering (Diploma Engineering)

DEPARTMENT OF: - Civil Engineering

SEMESTER: - V **CODE:** -2TE05WRM1

NAME –Water Resource Management

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme								
		Th	Tu	Pr	Total		Theory				Practical (Marks)				Total
							Sessional Exam		University Exam		Internal		University		
							Marks	Hours	Marks	Hours	Pr	TW	Pr	Tw	
2TE05WRM1	Water Resource Management	03	02	00	05	04	30	1.5	70	03	--	20	30	--	150

Objectives: Agriculturists – Meteorologists, Geologists - Industrialists- Scientists- Water quality – Biologists Control (Authority)- Mechanical Engg. - Electrical engg.- Economists - Social workers- NGO's – Politicians.

Pre-requisite: Basic knowledge of various Water as Vital Resource and Its Management

Course Outlines:-

Sr. No.	Course Contents	Teaching Hours
1	Introduction: (Water as Vital Resource and Its Management) Scope of W.R.M., Necessity of W.R.M., Role of various agencies in W.R.M.: - Agriculturists – Meteorologists, Geologists - Industrialists- Scientists- Water quality – Biologists Control (Authority)- Mechanical Engg. - Electrical engg.- Economists - Social workers- NGO's - Politicians- General Public Water Resource Projects in Gujarat (Focus on Technical Aspects) -Kalpasar-Sujalam Sufalam -Sardar Sarovar (Narmada Project)	07
2	Hydrology : (Water, its existence, distribution ,and Movement Throughout the Earth) Define Hydrology, Hydrological cycle, Forms of precipitation, Precipitation occupancy & its types. Measurement of rain fall Rain gauges. a. Non Recording – Symon's type b. Recording- Float type automatic rain gauges- Tipping bucket, Methods of determining average rain fall a. Arithmetic average method b. Thiessen's polygon method c. Isohytel method Determine No. of rain gauges for given catchment area.(Data to be given: (i) C. A. (ii) Coefficient of variance of rainfall (Cv) (iii)E = Allowable percentage error. Define: Evaporation, Transpiration & Evapo –transpiration, Enlist factors affecting evaporation.	09
3	Runoff : (Rainfall Excess on the Surface of Earth) Compute runoff by various methods. Factors affecting runoff. Coefficient method/ Rational method Formula (i) Dicken's formula (ii) Ryve's formula (iii) Inglis formula (iv) Nawab – Jung Bahadur formula Calculate run off by Index. (w-index and _index), Unit Hydrograph, Enlist assumptions of unit hydrograph. Construct unit hydrograph from a given storm hydrograph data (rainfall & stream - flow data),Construct flood hydrograph from given unit hydrograph for two or more periods of rainfall. Compute flood discharge from unit hydrograph	09

4	Advance Water Application Methods : (Micro Level Irrigation Methods) Soil water plant relation-ship, Classes of soil water, Compute field capacity,Classes of different crops with root-zone depth. Compute the water requirement of crop with effective root zone depth. Drip irrigation, Sprinkler irrigation ,(Enlist and briefly explain the suitability , Design layout parameters, components of above (b) & (c) methods, Advantages & Disadvantages of above methods. Water logging and drainage. Define water logging and ill effects of water logging. Surface and sub-surface drainage. Salt efflorescence	08
5	Ground Water : (Water Below the Earth Surface) Importance of ground water and present scenario, Necessity of recharging, Artificial recharging as today's need. Types of artificial recharge, Spreading method. Pit method / khet talavadi Induced recharge method, Recharge well method. Sub surface dam. Check dam series, Ponds, Unlined canals Case studies for above all. Suitability of artificial recharging method w.r.t. different regions in Gujarat State.	06
6	Sea Water Intrusion : (Land Area Under Salinity) Enlist ill effects of sea water intrusion , Discuss following remedial measures to control sea water intrusion. Modification of pumping. Artificial recharge by spreading area Pumping trough. Pressure ridge. Compute depth of Interface and draw the sketch	06

Term Work: - It is site visit to -Kalpasar-Sujalam Sufalam -Sardar Sarovar (Narmada Project)

Learning outcomes: Water, its existence, Distribution, and Movement Sea Water Intrusion: (Land Area Under Salinity) Advance Water Application Methods: (Micro Level Irrigation Methods) Throughout the Earth.

Books Recommended:-

1. Irrigation, Water Resources Dr. P.N. Modi Standard Book House, & Water Power Engg. Delhi.
2. Hydrology & Water Resources R.K. Sharma Dhanpat Rai & Sons, Delhi.
3. Ground water H.M.Ragunath New Age international Ltd., New Delhi.
4. Ground water assessment, K.R. Karanth Tata Mc Graw Hill Development & management Pub. Co. Ltd., New Delhi.
5. Principle & Practice of Irrigation S.K.Sharma S.Chand & Co, Delhi. Engg.
6. Hydrology & Water Resources Engg. S.K.Garg. Khanna Pub., Delhi.
7. Watershed management in India J.V.S. Moorthy Willey Eastern Ltd. New Age international Ltd., New Delhi.
8. Design of small dams. U.S.B.R.
9. Irrigation theory & practice A.M.Mitchel Vikas Pub. House Pvt. Ltd, Delhi.
10. Water vision 2050 Narmada, W.R. & water supply deptt., Gandhinagar
11. Techno economic letter Vol.-107 & 108 Gram technology Institute- Gujarat Secort.12, Gandhinagar.
12. Irrigation & water power engg. B.C. Punmia
13. Water Resources Engg.- C. Satyanarayan New Age International Ltd., Principles & Practice Murthy. New Delhi