GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL (WATER RESOURCES ENGINEERING) (33)
Master of Engineering
Subject Code: 3723305
Semester – II
Subject Name: WATER USE MANAGEMENT

Type of course: Program Elective IV

Prerequisite: Fundamental knowledge of irrigation engineering, soil water plant relationship, consumptive use of water.

Rationale:
Students will be able to understand irrigation efficiency, methods of irrigation, surface and sub-surface drainage system, automation and regulation of canal.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	**0**	**2**	**4**	**70**	**30**	**30**	**20**	**150**

Content:

Sr. No.	Content	Total Hrs
1	Soil surveys and irrigability classification, water quality, Irrigation water standards, Soil-water-plant relationship, Crop planning and crop patterns, Determination of consumptive use of crops, Irrigation efficiency, Irrigation scheduling, Methods of crop improvement, Soil and fertility management, Irrigation water application methods-surface methods, Simulation of flow in surface irrigation systems, Performance evaluation, Sensitivity analysis, parameter estimation, sprinkler and drip irrigation, Drainage of water-logged areas, Surface and subsurface drainage systems, Conjunctive use of surface water and groundwater, Saline and alkaline soils, Plants response to saline soils, Salt-tolerant crops, Reclamation and management of salt-affected soils, Measurement of irrigation water, Water Quality modelling, Desalination of irrigation water, Remote Sensing.	**30**
2	Automation and control and regulation of canals, Operation and management of irrigation projects, Command area development organization and their role in water management, Modernization of existing irrigation projects.	**15**

Reference Books:

1. Irrigation-Theory and practice - A.M.Michael
2. Modern irrigated soils - D.W. James, R.J. Hanks & Jurinak
3. Crop water requirements FAO publications No. 24

4. Arid Land Irrigation in Developing countries, Environmental problems & effects Pergamon press Oxford University 1977
5. Sprinkler Irrigation – Melvyn Kay
6. Drip Irrigation – S. K. Sharma
7. Surface Irrigation Systems – Walker & Skogerboe
8. Drainage Manual

Course Outcomes: At the end of the course, Student will be able to

Sr. No.	CO statement	Marks % weightage
CO-1	Understand quality and efficient use of irrigation water.	25
CO-2	Understand soil-water-plant relationship and determine consumptive use of crops.	25
CO-3	Design irrigation methods.	20
CO-4	Analyse automation and control of canals.	15
CO-5	Operate and maintain irrigation projects	15

Suggested Specification table with Marks (Theory): (For ME only)

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
10%	**20%**	**20%**	**20%**	**20%**	**10%**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

List of Tutorial:

1. Water use management
2. Classify the methods of irrigation
3. Explain soil water relationship in detail
4. How will you determine consumptive use of water
5. Write short note: (a) Irrigation scheduling (b) Soil fertility management (c) Sprinkler irrigation (d) Drip irrigation (e) Conjunctive use of surface water and ground water (f) How the salt affected soil can be reclaimed

6. Discuss command area development

List of major equipment: NIL

List of Open Source Software/learning website:

1. http://en.wikipedia.org/wiki/Category:Hydraulic_engineering