GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering

Course / Subject Code: ME01065061

Course / Subject Name : Irrigation Water management

w. e. f. Academic Year:	2024-2025
Semester:	1st Semester
Category of the Course:	PEC

Prerequisite:	Fundamental knowledge of irrigation engineering, soil water plant relationship, consumptive use of water
Rationale:	Irrigation water management is essential for sustainable development and for proper utilization of water in most efficient way .Students will be able to understand irrigation efficiency, methods of irrigation,surface and sub-surface drainage system, automation and regulation of canal.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Implement quality and efficient use of irrigation water	R,U
02	Apply soil-water-plant relationship and determine consumptive use of crops.	U,A,N
03	Design irrigation methods	A,N
04	Analyze automation and control of canals	A,N
05	Operate and maintain irrigation projects	A,N,E

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Water resource availability; Concept of crop water requirement; Direct and Indirect measurements/estimation of crop water requirement, water quality, Irrigation water standards, Soil water-plant relationship, Crop planning and crop patterns, Determination of consumptive use of crops, Conjunctive use of surface water and groundwater	12	30
2.	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, parameterestimation, sprinkler and drip irrigation method	12	30
3.	Drainage of water-logged areas, Surface and subsurface drainage systems, Saline and alkaline soils, Plants response to saline soils, Salttolerant crops, Reclamation and management of salt-affected soils, Measurement of irrigation water, Water Quality modelling, Desalination of irrigation water, Remote Sensing.	11	20
4.	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.	10	20
	Total	**45**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20	**20**	**20**	**20**	**20**	

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. Arid Land Irrigation in Developing countries, Environmental problems & effects Pergamon press Oxford University 1977
2. Crop water requirements FAO publications No. 24
3. Drainage Manual
4. Drip Irrigation – S. K. Sharma
5. Irrigation-Theory and practice - A.M.Michael
6. Modern irrigated soils - D.W. James, R.J. Hanks &Jurinak
7. Sprinkler Irrigation – Melvyn Kay
8. Surface Irrigation Systems – Walker &Skogerboe

(b) Open source software and website:

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

Suggested Course Practical List: If any

1. Water use management
2. The methods of irrigation
3. Soil water relationship in detail
4. Determination of consumptive use of water
5. Study of: (a) Irrigation scheduling (b) Soil fertility management (c) Sprinkler irrigation (d) Drip
6. irrigation (e) Conjunctive use of surface water and ground water (f) How the salt affected soil
7. can be reclaimed
8. Command area development demarcation

List of Laboratory/Learning Resources Required:

Pan evaporator

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