GUJARAT TECHNOLOGICAL UNIVERSITY
CIVIL ENGINEERING
B. E. SEMESTER: VII

Subject Name: **Irrigation Engineering**
Subject Code: **170602**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
4	2	0	6	70	30	30	20

Sr. No.	Contents	Hours
Module I		**12**
I	**Introduction:** Necessity of irrigation- scope of irrigation engineering- benefits and ill effects of irrigation- irrigation development in India- types of irrigation systems, Soil-water plant relationship: Classification of soil water- soil moisture contents- depth of soil water available to plants-permanent and ultimate wilting point **Water requirements of crops:** Depth of water applied during irrigation- Duty of water and delta- improvement of duty- command area and intensity of irrigation- consumptive use of water and evapotranspiration- irrigation efficiencies- assessment of irrigation water	
Module II		**12**
II	**Methods of irrigation:** Classification- choice of method of irrigation- surface and subsurface irrigation methods, Sprinkler and Drip Irrigation **Irrigation channels:** Alignment- canal capacity- losses- FSL of canal- design of canal in alluvial soil and non alluvial soils- Kennedy's silt theory- Lacey's regime theory- balancing depth- use of Garrets diagrams and Lacey's Regime diagrams- lining of irrigation channels- design of lined canal- drainage behind lining. Water logging: Causes, Measures: surface and sub-surface drains, land reclamation	

Module III		**12**
III	**Diversion headworks:** Types- selection of the suitable site for the diversion headwork- components of diversion headwork- Causes of failure of structure on pervious foundation- Khosla's theory- Design of concrete sloping glacis weir	
Module IV		**12**
IV	**Cross drainage works:** Types- selection of suitable type of CD works- aqueduct and Syphon aqueduct- determination of maximum flood discharge and waterway for drain, fluming of canal- uplift pressure on underside of barrel roof and at the floor of the culvert- design of bank connections **Canal regulation works:** Canal fall- necessity and location- types of falls- Cross regulator and distributory head regulator- their functions, Silt control devices, Canal escapes- types of escapes.	
Note: Each module carries equal weightage. **Term work:** Term work shall be based on the above mentioned topics		

Text Books:

1. P.N. Modi, Irrigation, Water Resources and Water Power Engineering, Standard Book house, New Delhi
2. S.K. Sharma, Principles and Practice of Irrigation Engineering, S. Chand & Company Pvt. Ltd, New Delhi
3. G L Asawa, Irrigation and Water Resources Engineering, New Age Int. Ltd.
4. B.C. Punmia, and B.B. Pande, "Irrigation and Water Power Engineering", Laxmi Publication Pvt. Ltd., New Delhi

Reference Book:

1. A.M. Micheal, "Irrigation, Theory and Practice", Vikas Publishing House Pvt. Ltd. New Delhi