



TENTATIVE TEACHING PLAN (THEORY)

Department: **Civil Engineering**

Name of Teacher: **Prof. Dr. Ashfaqe A. Memon**

Subject: **Irrigation and Drainage Engineering** Course Code: **CE443**

Batch: **20CE(B+D)** Year: **4th** Semester: **2nd (8th)**

Semester Starting Date: **15-07-2024**

Semester Suspension Date: **06-11-2024**

Course Learning Outcomes (CLOs): Upon successful completion of the course, the student will be able to:

CLO	Description	Taxonomy Level	PLO
1	DEMONSTRATE soil-water-crop relationships and various hydraulic structures.	C3	2
2	DESIGN irrigation canals and drainage system	C6	3

S. No.	Topic	CLO	No. of lecture/hrs. required
1.	Soil-Water-Crop Relationship: Introduction of irrigation, Soil and its physical and chemical properties, Root zone soil water, Crops of Pakistan and crop rotation.	1	3
2.	Methods of Irrigation: Irrigation methods, Factors affecting choice of irrigation methods, Pressurized and non-pressurized methods, Uniformity coefficient.	1	4
3.	Water Requirement of Crops: Functions of irrigation water, Standards for irrigation water	1	1
4.	Terminology, Relationship between duty and delta, Factors affecting and Improving duty	1	2
5.	Classes of soil water, Equilibrium points- soil moisture tension, Depth of effective root zone, Depth and Frequency of watering	1	2
6.	Evapotranspiration, Irrigation efficiencies, Gross irrigation requirements	1	4
7.	Canal Irrigation System: Alluvial and non-alluvial canals, Alignment of canals, Distribution system for canal irrigation, Determination of canal capacity, Canal losses and Channel section for minimum seepage loss.	2	3
8.	Canal Irrigation System and Design of Irrigation canals Variables affecting flow in earthen channels, Kennedy's theory, Lacey's theory, Hydraulic design of earthen channels	2	4
9.	Sediment transport, Tractive force method, Earthen canal section	2	2
10.	Lining and its advantages, Types of lining with their merits and demerits, Hydraulic design of lined channels, Drainage behind lining, Super elevation	2	3

11.	Discharge measurement in canals, Sediment measurement, Maintenance of canal section, Telemetry system.	2	2
12.	Canal Outlets Definition, Types, Essential requirements and characteristics of outlets, Tail cluster and tail escape.	1	1
13.	Diversion Head Works Weir and barrage with their Functions and Components, Design considerations for a barrage, Canal head regulator, Silt excluding devices.	1	3
14.	River training works: Types, Guide banks, Marginal banks, Spurs, Pitched islands.	1	2
16.	Dams: Types of dams and reservoirs, Storage zones of reservoirs, Storage capacity and yield of reservoir.	1	2
17.	Reservoir sedimentation and its control in reservoir, Economic height of dam, Factors governing the selection of type and site of dam.	1	2
18.	Waterlogging and salinity Waterlogging and its causes, Optimum depth of water table, Salinity and its causes, Waterlogging and salinity management techniques.	2	2
19.	Drainage methods Horizontal drainage, Tile drainage system and its design, disposal of drainage effluent, Installation of tile drains, Vertical (Tube well) drainage, Conditions required for vertical drainage, Design procedure of drainage tube wells.	2	5
20.	Cross drainage structures Introduction, Classification of cross drainage structures and their description.	2	1
TOTAL			48

Signature of Teacher:

Dated: 10-06-2024

Remarks of DMRC: **APPROVED**

Signature of Chairman:

Dated: 18/09/2024