EHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY JAMSHORO

Department of Civil Engineering

LESSON PLAN

COURSE TITLE: **Irrigation and Drainage Engineering**	COURSE CODE: **CE443**	CREDIT HOURS: **03**	MINIMUM CONTACT HOURS: **48**

COURSE INSTRUCTER: Prof. Dr. Ashfaque Ahmed Memon(B+D)/Engr. Abdul Qudoos Malano(A+C)

Batch: **20CE**	Semester: **8th**	Semester Starting Date: **15-07-2024**	Semester Suspension Date: **06-11-2024**

COURSE LEARNING OUTCOMES: Upon successful completion of the course, the student will be able to:

CLO No.	Description	Taxonomy level	Associated PLO
1	DEMONSTRATE soil-water-crop relationships and various hydraulic structures.	C3	2
2	DESIGN irrigation canals and drainage system	C6	3

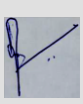
LESSON CONTENTS AND ASSOCIATED CLO(s)

Contents	CLO No.	Marks Assigned	Delivery Methods	Assessment Methods (Marks)
• **Soil-Water-Crop Relationship** Introduction of irrigation, Soil and its physical and chemical properties, Root zone soil water, Crops of Pakistan and crop rotation. • **Methods of Irrigation** Irrigation methods, Factors affecting choice of irrigation methods, Pressurized and non-pressurized methods, Uniformity coefficient. • **Water Requirement of Crops** Functions of irrigation water, Standards for irrigation water, Terminology, Relationship between duty and delta, Factors affecting duty, Improving duty, Classes of soil water, Equilibrium points- soil moisture tension, Depth of effective root zone, Depth and Frequency of watering, Evapotranspiration, Irrigation efficiencies, Gross irrigation requirements. **No. of Lectures: 16**	**1**	**32**	• Class Lectures • Discussion • Design Practice	• Class Test-I (5) • Mid semester Exam (15) • Final Exam (12)
• **Canal Irrigation System and Design of Irrigation Canals** 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. Variables affecting flow in earthen channels, Kennedy's theory, Lacey's theory, Hydraulic design of earthen channels, Sediment transport, Tractive force method, Earthen canal section, Lining and its advantages, Types of lining with their merits and demerits, Hydraulic design of lined channels, Drainage behind lining, Super elevation, Discharge measurement in canals, Sediment measurement, Maintenance of canal	**2**	**28**	• Class Lectures • Discussion • Design Practice	• Assignment-I (5) • Mid semester Exam (05) • Final Exam (18)

section, Telemetry system. **No. of Lectures: 14**				
• **Canal Outlets** Requirements of an outlet, Classification and description of outlets, Tail cluster and tail escape, Selection of the type of outlets. • **Diversion Head Works** Weir and barrage with their Functions, Components, and Design considerations, Canal head regulator, Silt excluding devices. • **River Training Works** Types, Guide banks, Marginal banks, Spurs, Pitched islands. • **Dams** Types of dams and reservoirs, Storage zones of reservoirs, Storage capacity and yield of reservoir, Reservoir sedimentation and its control in reservoir, Economic height of dam, Factors governing the selection of type and site of dam. **No. of Lectures: 10**	**1**	**23**	• Class Lecture • Discussion • Design Practice	• Assignment-II (5) • Final Exam (18)
• **Waterlogging and salinity** Waterlogging and its causes, Optimum depth of water table, Salinity and its causes, Waterlogging and salinity management techniques. • **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. • **Cross drainage structures** Introduction, Classification of cross drainage structures and their description. **No. of Lectures: 8**	**2**	**17**	• Class Lectures • Discussion • Design Practice	• Class Test / Quiz -II (5) • Final Exam (12)

ASSESSMENT DETAILS

S. No.	Assessment Activities	Marks	Activities		CLO(s) to be assessed
1	Class Test/Assignment/Project Design/ Presentation/Quiz/Field Report	**20**	Class Test/Quiz	2	1,2
			Assignments	2	1,2
2	Mid Semester Exam	**20**	1		1,2
3	Final Semester Exam	**60**	1		1, 2

Prepared by: **Prof. Dr. Ashfaque Ahmed Memon** Signature:  Dated: 29.05.2024	Reviewed by: **Curriculum Review Committee** Signature:  Dated: 30-05-2024	Approved by: **Chairman, CED** Signature:  Dated: 30-05-2024