Irrigation Engineering

Course Code	Credit Hours
CE-463	2-1

Course Description

Irrigation Engineering is studying about the technology & methods behind augmenting the crop growth. This course is designed to give the concepts of canal irrigation system and diversion head works. Students are also given the concept of canal design, flow measurement, regulation, operation and lining in an irrigation system.

Text Book:

1. Punmia B.C. , “Irrigation & Water Power Engineering”, Standard Publishers, Delhi

Reference Book:

1. Iqbal Ali, “Irrigation & Hydraulic Structures (Theory, Design & Practice)”, Allied Book Company, Lahore, Pakistan
2. Santosh Kumar Garg, “Irrigation Engineering & Hydraulic Structures”, Khanna Publishers, Dehli
3. R.K. Sharma & T.K. Sharma, “Irrigation Engineering”, S. Chand & Company, New Delhi
4. Asawa G.L., “Irrigation Engineering”, New Age International Publishers
5. Basak N.N., “Irrigation Engineering”, Tata McGraw-Hill Publishing Co. New Delhi
6. Dilip Kumar Majumdar, “Irrigation Water Management (Principles & Practices)”, Prentice Hall of India, Ltd
7. Gupta B.L. & Amir Gupta, “Irrigation Engineering”, Satya Praheshan, New Delhi
8. Michael A.M., “Irrigation Theory & Practical”, Vikas Publishing Pvt Ltd
9. FAO IDP 26 Small hydraulic structures

Prerequisites :

Nil**.**

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)

Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assesment/ Viva	20%

Teaching Plan

Week No	Topics/Learning Outcomes
1	Introduction to Irrigation Engineering and Water Resources of Pakistan
2 – 5	Water Requirements of Crops
6 – 8	Design of Earthen Canals
9	**Mid Semester Exam**
10 – 11	Diversion Head Works
12	Canal Flow Measurements
13	Cross Drainage Works
14	Canal Regulation Works
15	Canal Lining: Modern Concepts
16	• Canal Operation and Control • Methods of Irrigation; Water Requirements of Crops, Optimization of Crop Water Requirements by Artificial Intelligence • Canal Flow Measurements, Artificial Intelligence in Flow Metering
17-18	**End Semester Exam**

Practical

Experiment No	Description
1	Characteristics of Flow over Sharp Cornered Broad Crested Weir
2	Characteristics of Flow over Round Cornered (Streamlined) Broad Crested Weir
3	Characteristics of Flow over Crump Weir
4	Sluice Gate: Under Free Flow Condition Assess Q(H) & Compare with Qin
5	Sluice Gate: Under Submerged Condition Assess Q(H Upstream, H Downstream) & Compare with Qin

6	OEL: Compute thrust on a sluice gate in laboratory flume
7	Flow Measurements in Parshall Flume Q(H) & Comparison with Qin
8	Flow Measurements in Venturi Flume Q(H) & Comparison with Qin
9	Flow Measurements in WSC Flume Q(H) & Comparison with Qin
10	Characteristics of Flow over Gravel Bed
11	Characteristics of Flow over Corrugated Bed
12	WINFLUME: Getting Familiar with the Software