

River Engineering

Course Code CE- 462	Credit Hours 3-0
-------------------------------	----------------------------

Course Description

The course introduces the student to River Engineering. It unites the concepts and methods from open surface flow, sediment transport and river morphology and apply it to better comprehend, analyze and design the river and allied structures

Text Book:

1. Pierre Y. Julien, River Mechanics, Cambridge University Press, 2002.
2. Punmia B.C. , "Irrigation & Water Power Engineering", Standard Publishers, Delhi

Reference Book:

1. Stephen Darby (Ed) et al, Incised River Channels: Processes, Forms, Engineering and Management. John Wiley & Sons, 1999.
2. Hsieh W. Shen (Ed) Modeling of Rivers, John Wiley & Sons, 1979.
3. H. Chang, Fluvial Processes in River Engineering, John Wiley & Sons, 1988.
4. W. H. Graf, Fluvial Hydraulics: Flow and Transport Processes in Channels of Simple Geometry, John Wiley & Sons, 1999.

Prerequisites :

CE-251 Fluids Mechanics – I & CE-252 Fluids Mechanics - II

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 of River Engineering <ul style="list-style-type: none"> a. River Characteristics b. Use of Rivers Environmental Assessment of River
2 – 4	River Hydraulics <ul style="list-style-type: none"> a. Flow Classification b. Fundamental Equations c. Techniques of Hydraulic Studies d. Data Requirement for Hydraulic Studies e. Riverbank protection and Flood control structures f. Use of Modern Tools to analyze 2D River Flows (HEC-RAS)
5 – 8	River Morphology <ul style="list-style-type: none"> a. Classification of Rivers b. Behavior of Rivers c. River Regime Theories d. Meandering and Cut offs e. Effect of Dams on River Regimes
9	Mid Semester Exam
10-11	River Survey <ul style="list-style-type: none"> a. Introduction b. Mapping water levels, bed levels, discharges c. Stage Discharge Relationship d. Sediments mapping e. Water Quality mapping
12 – 13	River Training Works and Flood Control <ul style="list-style-type: none"> a. Riverbank protection works b. Design riprap c. Design filter d. Design groynes
14-16	River Engineering <ul style="list-style-type: none"> a. Introduction b. Bed Regulation c. Discharge Control d. Water Level Control e. Water Quality Control f. River Engineering for Various Purposes
17-18	End Semester Exam

Practical: Nil.