

CE424 BRIDGE ENGINEERING

(Dept. Elective - VI)

Course Description and Objective:

The student is expected to know the various types of a bridge and its related specifications. It also deals with design considerations of bridge and its substructure and foundation. (Working stress method is to be adopted for all designs)

Course Outcomes:

- *Design the slab culvert, Box culvert*
- *Design the T beam bridge and substructures*
- *Design the Bridge bearings.*

UNIT – I

Introduction & Investigation For Bridges : Components of a Bridge; Classification; Standard Specifications; Need for Investigation; Selection of Bridge Site; Preliminary Data to be Collected; Preliminary Drawings; Determination of Design Discharge; Economical Span; Location of Piers and Abutments; Vertical clearance above HFL; Scour depth; Traffic Projection; Choice of Bridge type; Importance of Proper Investigation.

UNIT – II

Concrete Bridges : Various types of bridges; I. R. C. Specifications for road bridges.

Culverts : Design of R. C. slab culvert.

UNIT – III

T – Beam Bridge : Pigeaud's method for computation of slab moments; Courbon's method for computation of moments in girders; Design of simply supported T – beam bridge.

UNIT – IV

Sub Structure For Bridges : Pier and abutment caps; Materials for piers and abutments; Design of pier; Design of abutment; Backfill behind abutment; Approach slab.

UNIT – V

Bearings For Bridges : Importance of bearings; Bearings for slab bridges; Bearings for girder bridges; Expansion bearings; Fixed bearings; Design of elastomeric pad bearing.

Foundations For Bridges : Scour at abutments and piers; Grip length; Types of foundations; Design of well foundation.

TEXT BOOK :

1. Dr. Johnson Victor, "Essentials of Bridge Engineering", 4th ed., Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, 2000.

REFERENCE BOOKS:

1. S. Ponnuswami, "Bridge Engineering", 2nd ed., Tata Mc Graw Hill Publishing House, New Delhi, 2002.
2. T.R. Jagadeesh and M.A. Jayaram, "Design of Bridge Structures", 2nd ed., PHI Learning Pvt. Ltd., New Delhi, 2010.
3. N. Krishna Raju, "Design of Bridges", 4th ed., Oxford Publishnig Co. Pvt. Ltd., New Delhi, 2001.