

BRIDGE ENGINEERING
(Using Working Stress Method)

Lectures / Tutorials : 4 Periods/Week
Semester End Exam. : 3 Hours

Sessional marks : 40
Semester End Exam. marks : 60
Credits : 4

Course Objectives:

- To explain various investigations to be conducted before constructing a bridge
- To introduce various types of RC bridges and IRC loadings
- To design slab culvert and T-beam bridge
- To design substructure for bridges
- To explain various types of bearings and design of elastometric bearing
- To explain various types of foundations and design of well foundation

Course Outcomes:

- Learn about the various investigations to be conducted before constructing a bridge
- Know about various types of RC bridges and IRC loadings
- Able to design slab culvert and T-beam bridge
- Able to design substructure like piers and abutments
- Know various types of bearings and able to design elastometric bearing
- Know the various types foundations used for bridges and able to design well foundation

UNIT – 1

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.

Concrete Bridges

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

UNIT – II

Culverts

Design of R. C. slab culvert.

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 – III

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 – IV

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.

NOTE

Two questions of 12 marks each will be given from each unit out of which one is to be answered. Twelve questions of one mark each will be given from entire syllabus which is a compulsory question.

TEXT BOOK

Essentials of Bridge Engineering by Dr. Johnson Victor; 6th Edition, Oxford & IBH Publishing Co. Pvt. Ltd., 2007.

REFERENCE BOOK

1. Design of bridge structures by Jagadeesh and Jayaram, 2nd Edition, PHI Learning, 2009.

WEB REFERNCES:

www.iitm.ac.in