

ST5015 DESIGN OF BRIDGES

DETAILED SYLLABUS

OBJECTIVE

To study the loads, forces on bridges and design of several types of bridges.

UNIT I GENERAL INTRODUCTION AND SHORT SPAN RC BRIDGES

Types of bridges and loading standards- Choice of type- I.R.C. specifications for road bridges- Design of RCC solid slab bridges - analysis and design of slab culverts, Tee beam and slab bridges.

UNIT II LONG SPAN RC BRIDGES

Design principles of continuous girder bridges, box girder bridges, balanced cantilever bridges– Arch bridges – Box culverts – Segmental bridges.

UNIT III PRESTRESSED CONCRETE BRIDGES

Flexural and torsional parameters – Courbon's theory – Distribution co-efficient by exact analysis – Design of girder section – maximum and minimum prestressing forces – Eccentricity– Live load and dead load shear forces – Cable Zone in girder – check for stresses at various sections – check for diagonal tension – Diaphragms – End block – short term and long term deflections.

UNIT IV STEEL BRIDGES

General – Railway loadings – dynamic effect – Railway culvert with steel beams – Plate girder bridges – Box girder bridges – Truss bridges – Vertical and Horizontal stiffeners.

UNIT V BEARINGS AND SUBSTRUCTURES

Different types of bearings – Design of bearings – Design of piers and abutments of different types – Types of bridge foundations – Design of foundations.

REFERENCES

1. Jagadeesh.T.R. and Jayaram.M.A., "Design of Bridge Structures", Prentice Hall of India Pvt. Ltd. 2004.
2. Johnson Victor, D. "Essentials of Bridge Engineering", Oxford and IBH Publishing Co. New Delhi, 2001.
3. Ponnuswamy, S., "Bridge Engineering", Tata McGraw Hill, 2008.
4. Raina V.K." Concrete Bridge Practice" Tata McGraw Hill Publishing Company, New Delhi, 1991.