

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Civil Engineering, VIII-Semester

Departmental Elective CE 802(C) Bridge Engineering

UNIT 1: Types of Bridge Super Structures

Introduction and types, temporary bridge superstructures, military bridges, other temporary bridges, permanent bridges, R.C.C. bridges, Pre-stressed concrete bridges, steel bridges, movable steel bridge.

Consideration of loads and stresses in road bridges: Introduction, loads, forces and stress, dead loads, bridge loading as per relevant IRC and IRS specifications traffic lanes, foot way, kerbs, railing and parapet loading, impact, wind load, longitudinal forces, Temperature effect of live load on back fill and on the abutment.

UNIT 2: Design of R.C. Bridge

Slab culvert, pipe culvert, T-beam, box culvert bridge super structure, Courbon's theory for load distribution, balanced cantilever bridges, design examples.

UNIT 3: Design of Steel Bridges

Types of steel superstructure, plate girder bridge, truss bridge, wind forces of lattice girder bridge, bracings, arch and bowstring girder bridge, design example.

UNIT 4: Pier, Abutment and Wing Walls

Types of piers and abutments, stability analysis of piers and abutments, design of piers, Forces on piers, stability, abutment, bridge code provision for abutments, wing walls, design examples.

UNIT 5: Foundations and Bearings

Types of bridge foundations and general design criteria, shallow foundations, deep foundations, piles, wells and pneumatic caissons, river training works.

Bearings: functions and types of bearings, necessity of bearings, design of elastomeric bearings, expansion joints, necessity and types of expansion joints, design considerations.

References Books:

1. Victor, D.J., Essential of Bridge Engineering , Oxford & IBH Publishing Co., New Delhi.
2. Rowe, R.E., Concrete Bridge Design , C.R. Books Ltd., London
3. Krishna Raju N, Design of Bridges, Oxford & IBH Publishing Co., New Delhi.
4. Bakht. B and Jaeger, L.C., Bridge Analysis Simplified, McGraw Hill Book Co. Inc.
5. Ponnuswamy, S., Bridge Engineering, Tata McGraw Hill, New Delhi.
6. Bakht, B. and Jaeger, L.G., Bridge Deck Analysis Simplified, McGraw Hill International Edition, Singapore
7. Aswani M.G., Vazirani V.N. and Ratwani M.M., Design of Concrete Bridges, Khanna publishers, New Delhi.
8. Hambly E.C., Bridge Deck Behaviour.
9. Sastry V.V., Design of Bridges, Dhanpat Rai & Co
10. Raina V.K., Concrete Bridge Design and Practice, Tata McGraw Hill, New Delhi.

11. Jagadeesh .T.R. and Jayaram.M.A., "Design of Bridge Structures", Prentice Hall of India Pvt. Ltd, Learning Pvt. Ltd., 2013
12. Indian Standard Codes and IRC codes related to bridges.