Course Code	Course Title	L	T	P	C
17CE017	BRIDGE ENGINEERING	3	0	0	3

Course Objectives:

1. To understand the various types of bridges
2. To understand the codal provisions for loading and design standards of bridges.
3. To design the superstructure of bridge using different methods and loading conditions.
4. To understand the design of bearings

Course Outcomes:

At the end of the course, student will be able

1. To familiarize with the usage of codal provisions in the design of bridges
2. To analyze and design substructure elements of bridges
3. To analyze and design various types of bridges like T-Beam bridge, Slab bridge, box culvert.
4. To understand the suitability of bearings for bridges.

Activities:

1. Determination of suitability of bridge to the site condition.
2. Make a model of bridge.
3. Analyse and design a bridge from substructure to super structure.

Skills:

1. Identify the type of bridge suitable for different soil and environmental conditions.
2. Design the bridge under primary and secondary loading conditions.

UNIT I: Introduction:

Introduction - Classification – Investigation for bridges - Economic span length- Loading standards – IRC and Railway loads – Impact.

UNIT-II: Bridge sub structure:

Evaluation of sub structures – Pier and abutments caps – Design of pier – Abutments – Type of foundations.

UNIT-III: Bridge super structure:

Super Structure: Slab bridge- Wheel load on slab- effective width method- slabs supported on two edges- cantilever slabs- dispersion length- box culvert.

UNIT-IV: T-Beam Bridge:

Design of T beam bridge- Pigeaud's method- design of longitudinal girders- Guyon-Messonet method- Hendry Jaegar method- Courbon's theory. (Ref: IRC-21).

UNIT-V: Bearings for Bridges:

Importance of Bearings – Bearings for slab bridges – Bearings for girder bridges – Electrometric bearing – Joints – Expansion joints. Understand the complexities in design of bridges.

TEXTBOOKS:

1. CBRI, "Building materials and components", India, 1990.
2. Gerostiza C.Z., Hendrikson C. and Rehat D.R., "Knowledge based process planning for construction and manufacturing", Academic Press Inc., 1994

REFERENCES:

1. Koncz T., "Manual of precast concrete construction", Vol. I, II and III, Bauverlag, GMBH, 1976.
2. "Structural design manual", Precast concrete connection details, Society for the studies in the use of precast concrete, Netherland Betor Verlag, 2009.