

## BRIDGE ENGINEERING

Course Category:	Hons	Credits:	4
Course Type:	Theory	Lecture-Tutorial-Practical:	3-1-0
Prerequisites:		Continuous Evaluation:	30
		Semester End Evaluation:	70
		Total Marks:	100

### Course Outcomes

Upon successful completion of the course, the student will be able to:

<b>CO1</b>	<b>Identify</b> loads on bridges and <b>design</b> of box culverts.	K6
<b>CO2</b>	<b>Design</b> of Bridge bearings and deck slab bridges.	K6
<b>CO3</b>	<b>Design</b> of T-beam bridges.	K6
<b>CO4</b>	<b>Design</b> of plate girder bridge and prestressed concrete T-beam bridges	K6
<b>CO5</b>	<b>Design</b> of piers and abutments	K6

### Contribution of Course Outcomes towards achievement of Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
<b>CO1</b>	2	2	2	2	2	3							3	2	3
<b>CO2</b>	2	2	2	2	2	3							3	2	3
<b>CO3</b>	3	3	3	3	3	3							3	3	3
<b>CO4</b>	2	2	2	2	2	3							3	2	3
<b>CO5</b>	3	3	3	3	3	3							3	3	3
<b>Avg.</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>							<b>3</b>	<b>2</b>	<b>3</b>

1- Low

2-Medium

3-High

## Course Content

<b>UNIT-1</b>	<b>INTRODUCTION:</b> Importance of site investigations in Bridge Design. Highway Bridge loading standards, Impact factor. Railway Bridge loading standards (B.G. ML Bridge) various loads in bridges. <b>BOX CULVERT</b> General aspects, Design loads, Design of box culvert subjected to RC class AA tracked vehicle only.	CO1
<b>UNIT-2</b>	<b>BRIDGE BEARINGS</b> General features-Types of bearings- Design principles of steel Rocker & Roller Bearings- Design of a steel rocker bearing-Design of elastomeric pad bearing. <b>DECK SLAB BRIDGE</b> Introduction- Effective width method of analysis, Design of deck slab bridge (simply supported) subjected to class AA tracked vehicle only.	CO2
<b>UNIT-3</b>	<b>DESIGN OF BEAM AND SLAB BRIDGE (T-BEAM)</b> General features-Design of interior panel of slab-Pigcauds Method-Design of T-beam bridge subjected to class AA tracked vehicle only.	CO3
<b>UNIT-4</b>	<b>PLATE GIRDER BRIDGE</b> Introduction- Elements of a plate girder and their design. Design of a deck type welded plate girder-Bridge of single line BG <b>DESIGN OF PSC BRIDGES:</b> Prestressed concrete T-beam bridges	CO4
<b>UNIT-5</b>	<b>PIERS AND ABUTMENTS</b> General features-Bed Block-Materials piers and Abutments, Types of piers-Forces acting on piers-Stability analysis of piers-General features of abutments-forces acting on abutments-Stability analysis of abutments-types of wing walls-approaches-General features of well foundations.	CO5

## Learning Resources

<b>Text Books</b>	<ol style="list-style-type: none"> <li>Victor D.J-Essentials of bridge Engineering, Oxford and INH Publishers</li> <li>Arya and Azmani-Design of steel structures, Nerchan Publishers</li> <li>Design of Bridge structures by T.R.Jagadish&amp; M.A.Jayram Prentice Hall of India Pvt., Delhi</li> </ol>
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	<ol style="list-style-type: none"><li>4. Design of Bridges by N.Krishnamaraju, Oxford &amp; and INH Publishers</li><li>5. Relevant- IRC &amp; Railway bridge codes.</li></ol>
<b>Reference Books</b>	<ol style="list-style-type: none"><li>1. Design of concrete bridges by Aswini, Vazrani,Ratwani</li><li>2. Bridge Engineering by Pnnuswamy, TATA Megraw Hill company, New Delhi</li><li>3. Design of RC structures by B.C.Pnumia, Jain and Jain, Lakshmi Publications</li><li>4. Design of Steel structures by B.C.Pnumia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi Publishers.</li><li>5. Design of R.C.C structures R.C.Pnumia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi Publishers.</li></ol>