



DEPARTMENT OF CIVIL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	M. Tech. – Structural Engineering		
Course Title	Bridge Engineering		
Course Code	CE623	No. of Credits	3
Course Code of Pre-requisite subject(s)			
Session	January 2022	Section (if, applicable)	-
Name of Faculty	Dr. Kamal Krishna Bera	Department	Civil Engineering
Email	kamal@nitt.edu	Telephone No.	+91 - 9301481280
Name of Course Coordinator(s) (if, applicable)	-		
E-mail	-	Telephone No.	
Course Type	<input type="checkbox"/> Core course	<input checked="" type="checkbox"/> Elective course	
<b>Syllabus (approved in Senate)</b>			
<p>Components of Bridges – Classification – Importance of Bridges – Investigation for Bridges – Selection of Bridge site – Economical span – Location of piers and abutments – Subsoil exploration – Scour depth – Traffic projection – Choice of bridge type.</p> <p>Specification of road bridges – width of carriageway – loads to be considered - dead load – IRC standard live load – Impact effect.</p> <p>General design considerations – Slab Bridge – Design of T-beam bridge – Prestressed concrete bridge – continuous bridge – Arch Bridge – Box girder bridge decks.</p> <p>Evaluation of sub structures – Pier and abutments caps – Design of pier – Abutments – Type of foundations.</p> <p>Importance of Bearings – Bearings for slab bridges – Bearings for girder bridges – Electrometric bearing – Joints – Expansion joints. Construction and Maintenance of bridges – Lessons from bridge failures.</p>			

<b>COURSE OBJECTIVES</b>	
1. To learn the components of bridges, classification of bridges, importance of bridges.	
2. To understand the investigation for bridges, subsoil exploration, choice of bridge type.	
3. To study the specification of road bridges, loads to be considered.	
4. To familiarize students with various types of bridges such as slab-bridge, T beam bridge, pre-stressed concrete bridge, continuous bridge, arch bridge, box girder bridge decks.	
5. To get exposure to evaluation of sub structures, type of foundations, importance of bearings, lessons from bridge failures.	
<b>COURSE OUTCOMES (CO)</b>	
<b>Course Outcomes</b>	<b>Aligned Programme Outcomes (PO)</b>
By the end of this course the students will be able to	
1. To be familiar with the components of bridges, classification of bridges, importance of bridges.	-
2. To understand the investigation for bridges, subsoil exploration, choice of bridge type.	-
3. To understand the specification of road bridges, loads to be considered.	-
4. To be familiar with various types of bridges such as slab-bridge, T-beam bridge, pre-stressed concrete bridge, continuous bridge, arch bridge, box girder bridge decks.	-
5. To get exposed to evaluation of sub structures, type of foundations, importance of bearings, lessons from bridge failures.	-

<b>COURSE PLAN – PART II</b>			
<b>COURSE OVERVIEW</b>			
This course gives a broad overview of Bridge Engineering. Loading on Bridges, Design of superstructure, bearing, substructure.			
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>			
<b>S.No.</b>	<b>Week/Contact Hours</b>	<b>Topic</b>	<b>Mode of Delivery (for all lectures)</b>
1	1 <sup>st</sup> week – 3 hours	Introduction, Types of Bridges	<ul style="list-style-type: none"> <li>• PPT and Explanation through Digital Writing Pad (online platform MS Team)</li> <li>• Lectures notes are shared after class</li> </ul>
2	2 <sup>nd</sup> week – 3 hours	Design discharge, Scour depth, waterway	
3	3 <sup>rd</sup> week – 3 hours	Highway Bridge Loading	
4	4 <sup>rd</sup> week – 3 hours	Load distribution in bridge deck	
5	5 <sup>rd</sup> week – 3 hours	Slab and Girder bridges	
6	6 <sup>th</sup> week – 3 hours	RC bridges	

7	7 <sup>th</sup> week – 3 hours	RC bridges	
8	8 <sup>th</sup> week – 3 hours	Prestressed concrete bridges	
9	9 <sup>th</sup> week – 3 hours	Long span bridges (cable-stayed)	
10	10 <sup>th</sup> week – 3 hours	Piers and Abutments for bridges	
11	11 <sup>th</sup> week – 3 hours	Shallow and Deep foundation for bridges	
12	12 <sup>th</sup> week – 3 hours	Bridge bearing	

#### **COURSE ASSESSMENT METHODS**

<b>S.No.</b>	<b>Mode of Assessment</b>	<b>Week/Date</b>	<b>Duration</b>	<b>% Weightage</b>
1	Quiz	5 <sup>th</sup> week	20 min	10
2	Assignment	6 <sup>th</sup> week	1 week	10
3	Mid sem	7 <sup>th</sup> week	2 hrs	30
3	Mini Project	13 <sup>th</sup> week	1 month	20
4	End sem	During end sem	2 hours	30

#### **COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)**

First feedback will be collected from students through the class representative (at the third week of October) to improve the online teaching methods. Also at the end of the semester for course evaluation as per institute norms.

#### **COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)**

##### **MODE OF CORRESPONDENCE (email/ phone etc)**

Apart from interactions with the students in the regular class, extra classes will be conducted if required. Students can also contact the concerned faculty member (24\*7 with prior appointment) as given below:

**Dr. Kamal Krishna Bera**

Email: kamal@nitt.edu

Mob: +91 - 9301481280

##### **COMPENSATION ASSESSMENT POLICY**

To be decided for the students with genuine reasons.

**ATTENDANCE POLICY** (A uniform attendance policy as specified below shall be followed)

- **At least 75% attendance in each course is mandatory.**
- **A maximum of 10% shall be allowed under On Duty (OD) category.**
- Students with **less than 65% of attendance** shall be prevented from writing the final assessment and **shall be awarded 'V' grade.**

**MINIMUM PASS MARK POLICY**

The Passing minimum mark: As per Institute norms.

**ACADEMIC DISHONESTY & PLAGIARISM**

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

The above policy against academic dishonesty shall be applicable for all the programs.

**FOR APPROVAL**



Course Faculty



CC-Chairperson \_\_\_\_\_

  
Head  
Department of Civil Engineering  
National Institute of Technology  
Tiruchirappalli - 620 015.

HOD \_\_\_\_\_