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| Image result for nit meghalaya logo | | | | **National Institute of Technology Meghalaya**  An Institute of National Importance | | | | | | | | | | | | | | | | | | | | | | | **CURRICULUM** | | | | | | |
| Programme | | | | **Bachelor of Technology in Civil Engineering** | | | | | | | | | | | | | Year of Regulation | | | | | | | | | | **2020-21** | | | | | | |
| Department | | | | **Civil Engineering** | | | | | | | | | | | | | Semester | | | | | | | | | | **VI** | | | | | | |
| Course  Code | | Course Name | | | | | | | | **Pre requisite** | | | | Credit Structure | | | | | | | | Marks Distribution | | | | | | | | | | | |
| L | | T | | | P | C | | INT | | | MID | | | END | | | | Total | |
| **CE 322** | | **Bridge Engineering** | | | | | | | | **Nil** | | | | **3** | | **0** | | | **0** | **3** | | **50** | | | **50** | | | **100** | | | | **200** | |
| Course  Objectives | | **To familiarize with the types, suitability, selection, design criteria of various types ofbridges.** | | | | | | | | | | Course Outcomes | | | | CO1 | | | Understand the load distribution and IRC standards. | | | | | | | | | | | | | | |
| **To impart knowledge for analysis and design of various types of bridges.** | | | | | | | | | | CO2 | | | Design the slab and T beam bridges. | | | | | | | | | | | | | | |
|  | | | | | | | | | | CO3 | | | Design Box culvert, pipe culvert | | | | | | | | | | | | | | |
|  | | | | | | | | | | CO4 | | | Use bearings, hinges and expansion joints and | | | | | | | | | | | | | | |
|  | | | | | | | | | | CO5 | | | Design Piers and abutments. | | | | | | | | | | | | | | |
|  | | | | | | | | | | CO6 | | | Understand the load distribution and IRC standards. | | | | | | | | | | | | | | |
| No. | COs | | Mapping with Program Outcomes (POs) | | | | | | | | | | | | | | | | | | | | | | | Mapping with PSOs | | | | | | | |
| PO1 | | PO2 | PO3 | PO4 | PO5 | PO6 | | PO7 | | PO8 | | PO9 | | | PO10 | | | PO11 | | PO12 | | | PSO1 | | | PSO2 | | | | PSO3 |
| 1 | CO1 | | **3** | | **3** | **0** | **1** | **0** | **0** | | **0** | | **0** | | **2** | | | **0** | | | **0** | | **0** | | | **3** | | | **0** | | | | **3** |
| 2 | CO2 | | **3** | | **3** | **0** | **1** | **0** | **0** | | **0** | | **0** | | **2** | | | **0** | | | **0** | | **0** | | | **1** | | | **0** | | | | **2** |
| 3 | CO3 | | **2** | | **3** | **2** | **1** | **2** | **1** | | **0** | | **0** | | **0** | | | **0** | | | **0** | | **0** | | | **2** | | | **3** | | | | **2** |
| 4 | CO4 | | **2** | | **2** | **3** | **0** | **2** | **2** | | **3** | | **0** | | **2** | | | **0** | | | **0** | | **1** | | | **2** | | | **3** | | | | **2** |
| 5 | CO5 | | **2** | | **2** | **2** | **0** | **2** | **2** | | **3** | | **0** | | **2** | | | **0** | | | **0** | | **1** | | | **3** | | | **3** | | | | **3** |
| 6 | CO6 | | **0** | | **0** | **0** | **0** | **0** | **0** | | **0** | | **0** | | **0** | | | **0** | | | **0** | | **0** | | | **0** | | | **0** | | | | **0** |
| SYLLABUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. | Content | | | | | | | | | | | | | | | | | | | | | | | Hours | | | | | | | COs | | |
| I | Introduction to bridges, classification, computation of discharge, linear waterway,economic span, afflux, scour depth Design loads for bridges, introduction to I.R.C.loading standards, Load Distribution Theory, Bridge slabs, Effective width,  Introduction to methods as per I.R.C. | | | | | | | | | | | | | | | | | | | | | | | **06** | | | | | | | **CO1** | | |
| II | Straight and skew slab bridges | | | | | | | | | | | | | | | | | | | | | | | **06** | | | | | | | **CO2** | | |
| III | Design of T beam bridges(up to three girders only) Proportioning of components,analysis of slab using IRC Class AA tracked vehicle, structural design of slab,analysis of cross girder for dead load & IRC Class AA tracked vehicle, structural  design of cross girder, analysis of main girder using Courbon’s method, calculationof dead load BM and SF, calculation of live load B M & S F using IRC Class AATracked vehicle. Structural design of main girder. | | | | | | | | | | | | | | | | | | | | | | | **06** | | | | | | | **CO2** | | |
| **CO3** | | |
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| IV | Other Bridges: Design of Box culvert (Single vent only), Design of Pipe culverts | | | | | | | | | | | | | | | | | | | | | | | **06** | | | | | | |  | | |
| **CO4** | | |
| VI | Substructures - Design of Piers and abutments, Introduction to Bridge bearings,Hinges and Expansion joints. | | | | | | | | | | | | | | | | | | | | | | | **06** | | | | | | | **CO5** | | |
| Total Hours | | | | | | | | | | | | | | | | | | | | | | | | **36** | | | | | |  | | | |
| **Essential Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. N Krishna Raju, “Design of Bridges, Oxford and IBH publishing company | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. T R Jagadeesh and M A Jayaram, “Design of bridge structures”, Prentice Hall ofIndia | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| **Supplementary Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Jain and Jaikrishna, “Plain and Reinforced Concrete”, Vol.2., Nem Chand Brothers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Standard specifications and code of practice for road bridges, IRC section I,II, IIIand IV. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. “Concrete Bridges”, The Concrete Association of India | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |