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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** | | | | | |
| Department | | | | **Civil Engineering** | | | | | | | | | | | | | Semester | | | | | | | | | | **VIII** | | | | | |
| Course  Code | | Course Name | | | | | | | | **Pre requisite** | | | | Credit Structure | | | | | | | | Marks Distribution | | | | | | | | | | |
| L | | T | | | P | C | | INT | | | MID | | | END | | | Total | |
| **CE412** | | **Prestressed Concrete and Industrial Structures** | | | | | | | | **Nil** | | | | **3** | | **0** | | | **0** | **3** | | **50** | | | **50** | | | **100** | | | **200** | |
| Course  Objectives | | 1. Todesign a prestressed concrete beam accounting for losses. | | | | | | | | | | Course Outcomes | | | | CO1 | | | Able to learn the principles, materials, methods and systems of prestressing. | | | | | | | | | | | | | |
| 1. To design the anchorage zone for post tensioned members. | | | | | | | | | | CO2 | | | Able to know the different types of losses and deflection of prestressed members. | | | | | | | | | | | | | |
| 1. To design composite members. | | | | | | | | | | CO3 | | | Able to learn the design of prestressed concrete beams for flexural, shear and tension and to calculate ultimate flexural strength of beam. | | | | | | | | | | | | | |
| 1. To design continuous beams. | | | | | | | | | | CO4 | | | Able to learn the design of anchorage zones, composite beams, analysis and design of continuous beam. | | | | | | | | | | | | | |
| 1. To design industrial structures subjected to different loading conditions. | | | | | | | | | | CO5 | | | Able to learn the design of industrial structures. | | | | | | | | | | | | | |
| 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 | 2 | 1 | 1 | 1 | | 0 | | 0 | | 1 | | | 0 | | | 0 | | 1 | | | 0 | | | 1 | | | 0 |
| 2 | CO2 | | 3 | | 3 | 2 | 1 | 1 | 1 | | 0 | | 0 | | 1 | | | 0 | | | 0 | | 1 | | | 0 | | | 1 | | | 0 |
| 3 | CO3 | | 3 | | 3 | 3 | 1 | 2 | 1 | | 1 | | 0 | | 1 | | | 0 | | | 1 | | 1 | | | 0 | | | 1 | | | 1 |
| 4 | CO4 | | 3 | | 3 | 3 | 1 | 2 | 1 | | 1 | | 0 | | 1 | | | 0 | | | 1 | | 1 | | | 0 | | | 1 | | | 1 |
| 5 | CO5 | | 3 | | 3 | 3 | 1 | 2 | 1 | | 1 | | 0 | | 1 | | | 0 | | | 1 | | 1 | | | 0 | | | 1 | | | 1 |
| SYLLABUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. | Content | | | | | | | | | | | | | | | | | | | | | | | Hours | | | | | | COs | | |
| I | **Principles of prestressing**  Materials of prestressing, Systems of prestressing, Loss of prestress, Deflection of prestressed concrete members. | | | | | | | | | | | | | | | | | | | | | | | **8** | | | | | | CO1 | | |
| II | **Pre-tensioned and Post-tensioned beams**  Design of prestressed concrete sections for flexure, shear, bond and anchorage forces minimum weight design. | | | | | | | | | | | | | | | | | | | | | | | **8** | | | | | | CO3 | | |
| III | **Analysis and design**  Analysis and design of indeterminate prestressed structures, Choice of cable profiles, Concordancy and linear transformation of cable profile, effect of creep and shrinkage on prestressed concrete structures, Design of end block, Partial prestressing, Definition- principles and design approach, Composite structures | | | | | | | | | | | | | | | | | | | | | | | **14** | | | | | | CO1, CO2, CO3, CO4 | | |
| IV | **Analysis of industrial structures**  Wind load analysis on Industrial building, Braced and Unbraced Industrial building. | | | | | | | | | | | | | | | | | | | | | | | **6** | | | | | | CO5 | | |
| Total Hours | | | | | | | | | | | | | | | | | | | | | | | | **36** | | | | | |  | | |
| **Essential Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Nawy E.G, “Prestressed Concrete: A fundamental approach”, Prentice Hall | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Mallick S.K. and Gupta A.P, “Prestressed Concrete”, Oxford & IBH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Krishna Raju N., “Prestressed Concrete”, Mc Graw Hill | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Lin, T.Y. “Design of Prestressed Concrete Structures”, John Wiley, & Sons. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Charles G.S. and Johnson J.E.,”Steel Structures-Design and Behaviou”, Addison –Wesley, Pub Co. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Chen W.F and Toma S. “Advanced analysis of steel frames”, CRC Press. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |