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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 314** | | **Design of Foundation and Retaining Structures** | | | | | | | | **Nil** | | | | **3** | | **0** | | | **0** | **3** | | **50** | | | **50** | | | **100** | | | **200** | |
| Course  Objectives | | **To develop an ability and skill to apply the codal provisions for the design of various types of foundation** | | | | | | | | | | Course Outcomes | | | | CO1 | | | **Able to Select appropriate soil investigation/testing technique/method and get true sub soil parameters used for selection of type of foundation as per codal guidelines.** | | | | | | | | | | | | | |
| **To impart knowledge about the various earth pressure concepts and the geotechnical design of retaining structures** | | | | | | | | | | CO2 | | | **Able to design shallow/Deep foundation satisfying bearing capacity and settlement requirements** | | | | | | | | | | | | | |
| **To select, analyze, and design an appropriate foundation and/or an earth retaining structure for a given scenario.** | | | | | | | | | | CO3 | | | **Able to make an assessment of the bearing capacity of the shallow and deep foundations on various types of soil conditions** | | | | | | | | | | | | | |
| CO4 | | | **Able to understand the earth pressure concepts and shall be able to analyse and design the earth retaining structure** | | | | | | | | | | | | | |
| CO5 | | | **Able to complete the design of retaining structures using appropriate design methods, factors of safety, design charts and field verification methods** | | | | | | | | | | | | | |
| 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 | | **1** | | **0** | **0** | **0** | **0** | **0** | | **1** | | **1** | | **0** | | | **0** | | | **0** | | **0** | | | **1** | | | **2** | | | **0** |
| 2 | CO2 | | **0** | | **1** | **0** | **0** | **0** | **0** | | **1** | | **1** | | **0** | | | **0** | | | **0** | | **0** | | | **1** | | | **3** | | | **0** |
| 3 | CO3 | | **0** | | **0** | **0** | **0** | **0** | **0** | | **1** | | **1** | | **0** | | | **0** | | | **0** | | **0** | | | **1** | | | **2** | | | **0** |
| 4 | CO4 | | **0** | | **1** | **0** | **0** | **0** | **0** | | **1** | | **1** | | **0** | | | **0** | | | **0** | | **0** | | | **1** | | | **2** | | | **0** |
| 5 | CO5 | | **0** | | **0** | **0** | **0** | **0** | **0** | | **1** | | **1** | | **0** | | | **0** | | | **0** | | **0** | | | **1** | | | **2** | | | **0** |
| **SYLLABUS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **No.** | **Content** | | | | | | | | | | | | | | | | | | | | | | | **Hours** | | | | | | **COs** | | |
| I | **Introduction** Soil exploration, analysis and interpretation of soil exploration data, estimation of soil parameters for foundation design. | | | | | | | | | | | | | | | | | | | | | | | **03** | | | | | | **CO1** | | |
| II | **Design of shallow foundations**  Introduction, Different types of foundations, Design of isolated footings, strip footings, Combined and Raft Foundations. | | | | | | | | | | | | | | | | | | | | | | | **10** | | | | | | **CO2** | | |
| **CO3** | | |
| III | **Design of deep foundations**  Introduction, Different types of foundations, Design methodology for piles, Calculation of pile capacity, Stresses in pile, Analysis for Single piles, pile groups and pile caps, Settlement of pile group, Concept of negative skin friction, Piles subjected to lateral loads, Pile load test, Design and construction of well foundation, piers etc. | | | | | | | | | | | | | | | | | | | | | | | **12** | | | | | | **CO2** | | |
| **CO3** | | |
| IV | **Design of retaining structures** Introduction, Different types of retaining structures, Stability analysis of rigid walls, Design of cantilever sheet piles, Design of anchored sheet piles, Bracing system for underground construction, Failure analysis for bracing system, Dewatering**.** | | | | | | | | | | | | | | | | | | | | | | | **11** | | | | | | **CO4** | | |
| **CO5** | | |
| Total Hours | | | | | | | | | | | | | | | | | | | | | | | | **36** | | | | | |  | | |
| **Essential Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Bowles. J.E., "Foundation Analysis and Design", Tata McGraw-Hill International Edition. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. [Arora](https://www.amazon.in/s/ref=dp_byline_sr_book_1?ie=UTF8&field-author=K+R+Arora&search-alias=stripbooks) K. R., "Soil Mechanics And Foundation Engineering", Standard Publishers Distributors. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Das B. M. "Principles of Geotechnical Engineering", Thompson Learning. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Coduto, D.P., "Foundation design: Principles and practices", Pearson publications. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Kurian, N.P. "Design of Foundation Systems - Principles and Practices", Narosa Publishing House. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Clayton, Milititski and Woods, "Earth pressure and earth retaining structures", Taylor & Francis Group, London. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |