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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** | | | | | | | | | | | | | Year of Regulation | | | | | | | | | | **2019** | | | | | |
| Department | | | | **Civil Engineering** | | | | | | | | | | | | | Semester | | | | | | | | | | **V** | | | | | |
| Course  Code | | Course Name | | | | | | | | **Pre requisite** | | | | Credit Structure | | | | | | | | Marks Distribution | | | | | | | | | | |
| L | | T | | | P | C | | INT | | | MID | | | END | | | Total | |
| **CE 304** | | **Geotechnical Engineering-II** | | | | | | | | **CE 301** | | | | **3** | | **0** | | | **0** | **3** | | **50** | | | **50** | | | **100** | | | **200** | |
| **Course**  **Objectives** | | To emphasize the importance of soil investigations including destructive and non-destructive methods | | | | | | | | | | **Course Outcomes** | | | | **CO1** | | | Able to identify different types of shallow foundations and design it as per their relevance in various field situations, and explain their behaviours. | | | | | | | | | | | | | |
| To explain how earth pressure theory is important in retaining structure design | | | | | | | | | | **CO2** | | | Able to compute stresses underneath a soil foundation | | | | | | | | | | | | | |
| To explain the concept of bearing capacity and how to estimate the safe bearing capacity for various foundation system including settlement consideration | | | | | | | | | | **CO3** | | | Able to identify the need of pile foundations and design it as per their relevance in various field situations, and explain their behaviours. | | | | | | | | | | | | | |
| To explain how do select a suitable shallow foundation system for various site conditions and also analysis of different foundation system | | | | | | | | | | **CO4** | | | Able to compute loads for a special deep (i.ecassion )foundation | | | | | | | | | | | | | |
| To explain in what circumstances pile is needed and how do analysis the pile and pile group under various soil conditions | | | | | | | | | | **CO5** | | | Able to identify the needs for ground improvement, and different soil exploration methods working principles | | | | | | | | | | | | | |
|  | | | | | | | | | | **CO6** | | | Able to indentify existence of dynamics loading conditions in soil | | | | | | | | | | | | | |
| 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** | **3** | **3** | **2** | **3** | | **3** | | **3** | | **3** | | | **2** | | | **3** | | **3** | | | **1** | | | **3** | | | **2** |
| 2 | CO2 | | **3** | | **3** | **3** | **3** | **3** | **3** | | **2** | | **3** | | **2** | | | **1** | | | **1** | | **3** | | | **1** | | | **3** | | | **2** |
| 3 | CO3 | | **3** | | **3** | **3** | **3** | **2** | **3** | | **3** | | **3** | | **3** | | | **2** | | | **3** | | **3** | | | **1** | | | **3** | | | **2** |
| 4 | CO4 | | **3** | | **3** | **3** | **3** | **2** | **3** | | **2** | | **3** | | **2** | | | **1** | | | **1** | | **3** | | | **1** | | | **3** | | | **2** |
| 5 | CO5 | | **3** | | **3** | **3** | **3** | **3** | **2** | | **2** | | **3** | | **2** | | | **2** | | | **1** | | **3** | | | **1** | | | **3** | | | **2** |
| 6 | CO6 | | **3** | | **3** | **3** | **3** | **2** | **2** | | **2** | | **3** | | **2** | | | **1** | | | **1** | | **3** | | | **1** | | | **3** | | | **2** |
| SYLLABUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. | Content | | | | | | | | | | | | | | | | | | | | | | | Hours | | | | | | COs | | |
| I | Soil Exploration and Site Investigation: Planning of subsurface exploration, methods, sampling and samplers, In situ tests – plate load test, standard penetration test, static and dynamic cone test, Vane shear test, Sub soil investigation report. | | | | | | | | | | | | | | | | | | | | | | | **05** | | | | | | **CO1** | | |
| **CO2** | | |
| **CO5** | | |
| II | Shallow Foundations: Bearing Capacity, Terzagi, Meyerhoff, IS code methods for determination of bearing capacity, Effect of depth of water table, eccentricity and inclination of load. Bearing capacity in slopes and layered soil. Bearing capacity from in situ tests. Immediate and consolidation settlement. Correction for pore pressure, depth and rigidity. Settlement from field tests | | | | | | | | | | | | | | | | | | | | | | | **10** | | | | | | **CO1** | | |
| **CO2** | | |
| III | Stresses in Soil: Bossiness Equation, Newmark’s Chart, computation of stresses in horizontal direction as well as in vertical direction. | | | | | | | | | | | | | | | | | | | | | | | **04** | | | | | | **CO2** | | |
| IV | Deep Foundations: Pile load capacity, group action, settlement, negative skin friction, lateral load capacity, pile load tests. | | | | | | | | | | | | | | | | | | | | | | | **05** | | | | | | **CO2** | | |
| **CO3** | | |
| **CO4** | | |
| V | Cassion Foundations: Types and selection, forces and moments, fitting of caisson, depth determination | | | | | | | | | | | | | | | | | | | | | | | **04** | | | | | | **CO2** | | |
| **CO3** | | |
| VI | Ground Improvement Techniques: Methods, compaction stabilisation using Admixtures, stone columns, sand drains, grouting. | | | | | | | | | | | | | | | | | | | | | | | **04** | | | | | | **CO2** | | |
| **CO3** | | |
| **CO5** | | |
| VII | Soil Dynamics and Machine Foundation: Concept of modulus of sub grade reaction, elastic half space theory, dynamic soil parameters, Design Criteria for machine foundation, natural frequency determination | | | | | | | | | | | | | | | | | | | | | | | **04** | | | | | | **CO6** | | |
| Total Hours | | | | | | | | | | | | | | | | | | | | | | | | **36** | | | | | |  | | |
| **Essential Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Ranjan, G. and Rao, A.S.R., “Basic and Applied Soil Mechanics”, New Age International | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Terzaghi K., Peck R. B. and MesriG.,”Soil Mechanics in Engineering Practice”, John Wiley & Sons | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. KanirajS.R.,”Design Aids in Soil Mechanics & Foundation Engineering”, Tata McGraw Hill | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Lambe, T.W and Whitman R.V., “Soil Mechanics”, John Wiley & Sons. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Punmia B.C., “Soil Mechanic and Foundation Engineering”, Laxmi Publication Pvt. Ltd. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Braja M. Das., “Fundamental of Foundation Engineering”, Thomson Asia Pvt. Ltd, Singapore. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |