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| Image result for nit meghalaya logo | | | **National Institute of Technology Meghalaya**  An Institute of National Importance | | | | | | | | | | | **CURRICULUM** | | | |
| Programme | | | **Master of Technology** | | | | | Year of Regulation | | | | | | **2018-19** | | | |
| Department | | | **Civil Engineering** | | | | | Semester | | | | | | **II** | | | |
| Course  Code | | Course Name | | Pre requisites | | Credit Structure | | | | | Marks Distribution | | | | | | |
| L | T | | P | C | INT | | MID | | END | | Total |
| **CE506** | | **Slopes and Retaining Structures** | | **None** | | **3** | **0** | | **0** | **3** | **50** | | **50** | | **100** | | **100** |
| Course  Objectives | | 1. To impart knowledge on investigation, analysis, design, and stabilization of slopes. 2. To learn basic concepts of analysing stability of slopes; seepage; design of different types of retaining structures. | | | Course Outcomes | | CO1 | | Able to Gain knowledge about the purpose of computing slope stability and understand the basic concepts of various slope stability analysis procedures. | | | | | | | | |
| CO2 | | Able to estimate seepage through dam sections and foundations | | | | | | | | |
| CO3 | | Able to Identify the basic design requirements and causes of failures of dams, distinguish foundation types and the different fill materials | | | | | | | | |
| CO4 | | Able to understand the Earth pressure theories, concepts on rigid and flexible retaining structures, bulkheads | | | | | | | | |
| CO5 | | Able to understand the concepts and design the Reinforced soil walls/slopes | | | | | | | | |
| SYLLABUS | | | | | | | | | | | | | | | | | |
| **No.** | **Content** | | | | | | | | | | | **Hours** | | | | **COs** | |
| I | **Slope stability**  Infinite slopes; finite height slopes – Swedish method, Bishop’s simplified method and other limit equilibrium methods; Stability charts; conditions of analysis – steady state, end of construction and sudden draw down; earthquake effects. | | | | | | | | | | | **08** | | | | **CO1** | |
| II | **Seepage**  Flow-net in isotropic, anisotropic, and layered media; entrance-exit conditions; determination of phreatic line. | | | | | | | | | | | **06** | | | | **CO2** | |
| III | **Earth Dams**  Introduction, factors influencing design, design of components, construction, instrumentation. Road and rail embankments. | | | | | | | | | | | **07** | | | | **CO3** | |
| IV | **Earth Pressure**  Types; Rankine’s theory and Coulomb’s theory; Effects due to wall friction; Graphical methods; Earthquake effects. Rigid retaining structures: Types; stability analysis. Flexible retaining structures: Types; material; cantilever sheet piles; anchored bulkheads–methods of analysis, moment reduction factors; anchorage. | | | | | | | | | | | **08** | | | | **CO4** | |
| V | **Reinforced soil walls**  Elements and stability. Soil arching. Braced excavation: Pressure distribution in sands and clays; bottom heave, Reinforced slopes. Soil nailing; Gabions. | | | | | | | | | | | **07** | | | | **CO5** | |
| **Total Hours** | | | | | | | | | | | | **36** | | | |  | |
| **Essential Readings** | | | | | | | | | | | | | | | | | |
| 1. Abramson, L. W., Lee, T. S., Sharma, S., and Boyce, G. M. (1996). Slope Stability and Stabilization Methods, John Wiley & Sons, New York. | | | | | | | | | | | | | | | | | |
| 1. Anderson, M.G., and Richards, K.S., Slope Stability, John Wiley, 1987. | | | | | | | | | | | | | | | | | |
| 1. Atkinson, J.H., Foundations and Slopes, McGraw Hill, 1981. | | | | | | | | | | | | | | | | | |
| 1. Gulati and Datta "Geotechnical Enginering", Tata Mc Graw Hill. | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | |
| 1. Muni Budhu, Soil Mechanics and Foundations, John Wiley and Sons, Inc, Network, 2000. | | | | | | | | | | | | | | | | | |
| 1. Chowdhury, D.F., Slope analysis, Prentice Hall, 1988. | | | | | | | | | | | | | | | | | |
| 1. Braja M. Das, "Principles of Foundation engineering", PWS Publishing Company. | | | | | | | | | | | | | | | | | |