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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** |
| CourseCode | Course Name | Pre requisites | Credit Structure | Marks Distribution |
| L | T | P | C | INT | MID | END | Total |
| **CE568** | **Soil Structure interaction** | **None** | **3** | **0** | **0** | **3** | **50** | **50** | **100** | **100** |
| CourseObjectives | 1. To make the students understand various theories applicable to Soil-Structure-Interaction and the principal components of Soil-Structure-Interaction concisely
2. To make the students aware of the collective response of the structure, the foundation, and the geologic media underlying and surrounding the foundation, to a specified free-field ground motion.
3. To make the students learn and modelling of seismic soil-structure interaction effects on building structures in engineering practice.
 | Course Outcomes | CO1 | Students will be able to relate with the practical significance and importance of Soil-Structure interaction |
| CO2 | Students will be able to model Soil-structure interaction problems using various concepts. |
| CO3 | Students will be able to compute various parameters associated with dynamic analysis of structure and foundation |
| CO4 | Students will be able to understand the Material nonlinearity of soil |
| CO5 | Students will be able to apply the theories of Dynamic Soil-Structure Interaction to various practical Engineering problems. |
| SYLLABUS |
| **No.** | **Content** | **Hours** | **COs** |
| I | **Introduction**Objectives and practical significance and importance of Soil-Structure interaction (SSI); Fixed base structure, Structures on soft ground; Modelling of unbounded media. | 05 | **CO1** |
| II | **Fundamentals of Soil-Structure Interaction**Rational methods of analysis of substructure; Equation of motion for flexible and rigid base; Kinematic interaction, Inertial interaction, and Effect of embedment. | 05 | **CO1** |
| III | **Modelling of Soil-structure interaction** Discrete model Winkler, Pasternak, Filoneko-Borodich, Hetenyi, Kerr, Rhines; Continuum model: Vlazov, Reissner, Biots, Gorbunov and Posadov; Modeling of boundaries. | 08 | **CO2** |
| IV | **Concepts in dynamic analysis of structure and foundation**Dynamic stiffness of Surface foundation, Embedded foundation, Shallow (strip) foundation and Deep (piles) foundations.  | 06 | **CO3** |
| V | **Nonlinear Analysis** Material nonlinearity of soil, Geometrical nonlinearity; Soil-pile structure interaction. | 06 | **CO4** |
| VI | **Engineering Applications**Engineering Applications of Dynamic Soil-Structure Interaction. | 06 | **CO5** |
| **Total Hours** | **36** |  |
| **Essential Readings** |
| 1. Selva durai, A. P. S, “Elastic Analysis of Soil-Foundation Interaction”, Elsevier, 1979.
 |
| 1. Bowles, J.E., “Foundation analysis and design”, McGraw Hill 1996.
 |
| 1. Tomlinson, M. J., “Foundation Design and construction”, English language book society and pitman, London.
 |
| 1. Chowdhury, I. and Dasgupta, S. P., “Dynamics of Structure and Foundation – A Unified Approach”, CRC Press, Balkema, *2009.*
 |
| **Supplementary Readings** |
| 1. Kurian, N. P., “Design of Foundation Systems – Principles and Practices”, Publishing House, New Delhi, Alpha Science International, U.K.,2005.
 |
| 1. J.W. Bull, “Soil-Structure Interaction: Numerical Analysis and Modelling”, CRC Press, 1st edition,1994.
 |
| 1. Desai C.S.& Christian J.T., “Numerical Methods in Geotechnical Engineering”, McGraw Hill.
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