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|  | **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 | **V** |
| Course Code |  Course Name | **Pre-Requisite** | Credit Structure | Marks Distribution |
| **CE353** |  **Transportation Engineering Lab-I** | **Nil** | L | T | P | C | Continuous Assessment | Total |
| **0** | **1** | **2** | **2** | **01 Experiment** | **10** | **100** |
| Course Objectives | To carry out tests on construction materials for their suitability to be used in pavement constructions. | Course Outcomes | CO1 | To monitor and maintain pavement structures. |
| To identify and classify the pavement materials into different groups according to their characteristics. | CO2 | Students will develop insight into the characterization aspects of various pavement materials for use in highways, airports and railways. |
| To make the students understand the various testing protocols for pavement materials as per BIS standards. | CO3 | Students will be able to develop Job mix formula and carry out mix design for various types of bituminous mixes. |
|  | CO4 | Students will be able to prepare the testing reports related to highway engineering works. |
|  | CO5 | Students will develop the understanding of various BIS, IRC and ISO standards and to design the highways in conformity with these codes. |
| 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** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **2** | **3** | **3** | **1** |
| 2 | CO2 | **3** | **3** | **3** | **0** | **0** | **1** | **1** | **0** | **0** | **0** | **0** | **1** | **3** | **3** | **1** |
| 3 | CO3 | **3** | **2** | **1** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **1** | **3** | **2** |
| 4 | CO4 | **3** | **3** | **2** | **0** | **0** | **0** | **2** | **0** | **0** | **0** | **0** | **0** | **1** | **3** | **1** |
| 5 | CO5 | **0** | **0** | **1** | **0** | **1** | **0** | **2** | **0** | **0** | **0** | **0** | **1** | **1** | **2** | **3** |
| SYLLABUS |
| No. | Content | Hours | COs |
| 1 | Introduction | 02 | **CO1 CO2 CO3 CO4 CO5** |
| 2 | Aggregate Impact value test | 02 |
| 3 | Los Angeles Abrasion value Test | 02 |
| 4 | Aggregate crushing value test | 02 |
| 5 | Elongation and Flakiness index test | 02 |
| 6 | Bitumen Penetration test | 02 |
| 7 | Ductility test of bitumen | 02 |
| 8 | Softening point test | 02 |
| 9 | Flash and fire point test | 02 |
| 10 | Aggregate Impact value test | 02 |
| 11 |  Carry out Bituminous mix design as per Marshall method of Mix design. | 02 |
| 12 | Revision and doubt clearing sessions | 02 |  |
| Total Hours | **24** |  |
| **Essential Readings** |
| 1. Venkatappa, G. R, Ramachandra, K. R, Kaushik, P, Bhavanna, D.V. R, “Highway Material Testings and Quality Control” |
| 2. Khanna, S.K. and Justo, “Highway Engineering”, C.E.G.,Nemchand Bros |
| **Supplementary Readings** |
| 1. MORT& H, “Specifications of Road and Bridge Works”,. |
| 2. Harold, N. A., “Highway Materials, Soil and Concrete”, Prentice Hall |
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