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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 | | | | | | | **2019-20** | | | | |
| Department | | | | **Civil Engineering** | | | | | | | | | | | | | Semester | | | | | | | **VI** | | | | |
| Course Code | | Course Name | | | | | | | | Pre-Requisite | | | | Credit Structure | | | | | | Marks Distribution | | | | | | | | |
| **CE 352** | | **Hydraulics and Hydraulic Structures Laboratory** | | | | | | | | **NIL** | | | | L | | T | | P | C | Continuous Assessment | | | | | | | Total | |
| **0** | | **1** | | **2** | **2** | **01 Experiment** | | | | **10** | | | **100** | |
| Course Objectives | | To develop the student’s knowledge on basics of open channel flow. | | | | | | | | | | Course Outcomes | | | | CO1 | | Student will be able to understand the basics of open channel flow including types, velocity distribution and pressure distribution. | | | | | | | | | | |
| To provide some knowledge about various methods for calculating critical flow depths in open channel flow. | | | | | | | | | | CO2 | | Student will demonstrate the ability to perform analysis of critical flow. | | | | | | | | | | |
| To develop understanding of uniform flow concept in hydraulics. | | | | | | | | | | CO3 | | Student will be able to understand the concept the uniform flow. | | | | | | | | | | |
| To make the student understand about the practical problems related with gradually varied flow. | | | | | | | | | | CO4 | | Student will be able to compute gradually varied flow. | | | | | | | | | | |
|  | | | | | | | | | | CO5 | | Student will be able to formulate and solve rapidly varied flow problems. | | | | | | | | | | |
|  | | | | | | | | | | CO6 | | Student will be able to understand the concept of working and design principles of various hydraulic structures. | | | | | | | | | | |
| 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** | **0** | **0** | **0** | **0** | | **0** | | **0** | | **0** | | | **0** | **0** | | **0** | | **0** | | **0** | | | **0** |
| 2 | CO2 | | **3** | | **3** | **3** | **0** | **0** | **0** | | **0** | | **0** | | **0** | | | **0** | **0** | | **0** | | **0** | | **0** | | | **3** |
| 3 | CO3 | | **3** | | **3** | **3** | **0** | **0** | **0** | | **0** | | **0** | | **0** | | | **0** | **0** | | **0** | | **0** | | **0** | | | **3** |
| 4 | CO4 | | **3** | | **3** | **3** | **0** | **0** | **0** | | **0** | | **0** | | **0** | | | **0** | **0** | | **0** | | **0** | | **0** | | | **3** |
| 5 | CO5 | | **3** | | **3** | **3** | **0** | **0** | **0** | | **3** | | **0** | | **0** | | | **0** | **0** | | **0** | | **0** | | **3** | | | **3** |
| 6 | CO6 | | **3** | | **3** | **3** | **0** | **0** | **0** | | **3** | | **0** | | **0** | | | **0** | **0** | | **0** | | **0** | | **3** | | | **3** |
| SYLLABUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. | Content | | | | | | | | | | | | | | | | | | | | | Hours | | | | COs | | |
| 1 | **Calibration of flow channel** | | | | | | | | | | | | | | | | | | | | | **02** | | | | **CO1 CO2 CO3 CO4 CO5**  **CO6** | | |
| 2 | **Determination of roughness coefficient of an experimental flume** | | | | | | | | | | | | | | | | | | | | | **04** | | | |
| 3 | **To determine the specific energy, Critical depth and plot the specific energy curve** | | | | | | | | | | | | | | | | | | | | | **04** | | | |
| 4 | **To determine the coefficient of a crump weir & broad crested weir** | | | | | | | | | | | | | | | | | | | | | **04** | | | |
| 5 | **To determine the coefficient of a sharp crested weir & ogee weir** | | | | | | | | | | | | | | | | | | | | | **04** | | | |
| 6 | **Determination of sequent depths in a hydraulic jump** | | | | | | | | | | | | | | | | | | | | | **04** | | | |
| 7 | **Comparison of experimental and computed Gradually Varied flow profile** | | | | | | | | | | | | | | | | | | | | | **04** | | | |
| 8 | **To determine the coefficient of discharge of a Venturi flume** | | | | | | | | | | | | | | | | | | | | | **04** | | | |
| 9 | **Flow under a sluice gate** | | | | | | | | | | | | | | | | | | | | | **04** | | | |
| 10 | **Viva-voce and exam** | | | | | | | | | | | | | | | | | | | | | **02** | | | |
| Total Hours | | | | | | | | | | | | | | | | | | | | | | **36** | | | |  | | |
| **Essential Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. M. H. Chaudhry, “Open Channel Flow”, Prentice Hall, 2nd Edition, 2008 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. K. G., RangaRaju, “Flow Through Open Channels”, Tata McGraw Hill, 2nd Edition 1993. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. F. M. Henderson, “Open Channel Flow”, Tata McGraw Hill, 1st Edition, 1992. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. V.T. Chow, “Open Channel Hydraulics”, Tata McGraw Hill, 3rd Edition, 2009. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. F. M. Henderson, “Open Channel Flow”, Tata McGraw Hill, 1st Edition, 1992. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |