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|  | **National Institute of Technology Meghalaya**An Institute of National Importance | **CURRICULUM** |
| Programme  | **Bachelor of Technology in Mechanical Engineering** | Year of Regulation  | **2018** |
| Department  |  **Mechanical Engineering** | Semester  | **IV** |
| Course Code | Course Name | Credit Structure | Marks Distribution |
| L | T | P | C | Continuous Evaluation | Total |
| **ME 256** | **Fluid Machine Lab.** | **0** | **1** | **2** | **2** | **100** | **100** |
| Course Objectives | To understand the cavitation and water hammer | Course Outcomes | CO1 | Explain various turbines and pumps, demonstratecavitation and water hammer phenomenon with the safety features (Understanding) |
| CO2 | Experiments with pumps to obtain various performanceparameters. (Applying) |
| To understand the basic working principles of various turbines and pumps | CO3 | Experiment with Pelton turbine, Francis turbine to obtain various performance parameters. (Applying) |
| 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  | **2** | **2** | **2** | **0** | **0** | **0** | **0** | **0** | **2** | **0** | **0** | **0** | **2** | **1** | **0** |
| 2 | CO2  | **2** | **2** | **2** | **0** | **0** | **0** | **0** | **0** | **2** | **0** | **0** | **0** | **2** | **1** | **0** |
| 3 | CO3  | **2** | **2** | **2** | **0** | **0** | **0** | **0** | **0** | **2** | **0** | **0** | **0** | **2** | **1** | **0** |
| 4 | CO4  | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| 5 | CO5  | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| 6 | CO6  | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| SYLLABUS |
| No. | Content | Hours | COs |
| 1 | To study the functioning of a venture tube.  | **05** | **CO1** |
| 2 | To study and analyze the cavitation processes at various flow rates. | **05** | **CO1** |
| 3 | Study of the water hammer and surge operation, determination of sound velocity in water and natural frequency in surgechamber. | **06** | **CO1** |
| 4 | Series operation of the pump, determination of head, recording of pump characteristics, hydraulic power.  | **04** | **CO2** |
| 5 | Parallel operation of the pump, determination of head, recording of pump characteristics, hydraulic power. | **04** | **CO2** |
| 6 | Performance analysis, finding the characteristic curve of the Pelton Turbine, and evaluating the influence of nozzle cross section on the characteristics. | **06** | **CO3** |
| 7 | Performance analysis & finding the characteristic curve of the Francis Turbine, influence of guide vane position on the characteristics. | **06** | **CO3** |
| Total Hours | **36** |  |
| **Essential Readings** |
| 1*.* S.K. Som, G. Biswas and S.Chakraborty, “Introduction to Fluid Mechanics and Fluid Machines”, TMH, 3rd Edition, 2011 |
| **Supplementary Readings** |
| 1.J. Lal, “Hydraulic Machines including Fluidics”, Metropolitan Book, 1994 |