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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, demonstrate  cavitation and water hammer phenomenon with the safety features (Understanding) | | | | | | | | | |
| CO2 | | Experiments with pumps to obtain various performance  parameters. (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 surge  chamber. | | | | | | | | | | | | | | | | | | **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 | | | | | | | | | | | | | | | | | | | | | | | | | |