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| Image result for nit meghalaya logo | **National Institute of Technology Meghalaya**An Institute of National Importance | **CURRICULUM** |
| Programme | **Bachelor of Technology in Civil Engineering** | Year of Regulation | **2019-20** |
| Department | **Department of Civil Engineering** | Semester | **IV** |
| CourseCode | Course Name | **Pre requisite** | Credit Structure | Marks Distribution |
| L | T | P | C | INT | MID | END | Total |
| **CE 252** | **ENVIRONMENTAL ENGINEERING - I LAB** | **NIL** | **0** | **1** | **2** | **2** |  | **100** | **100** |
| CourseObjectives | To familiarize the students with the analysis of the various physical and chemical parameters of water and waste water | Course Outcomes | CO1 | Identify environmental problems arising due to engineering and technological activities and the science behind those problems |
|  | CO2 | Estimate the population - economic growth, energy requirement and demand. |
|  | CO3 | Analyse material balance for different environmental systems. |
|  | CO4 | Realize the importance of ecosystem and biodiversity for maintaining ecological balance |
|  | CO5 | Identify the major pollutants and abatement devices for environmental management and sustainable development |
|  |  |
| 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 | **0** | **3** | **3** | **2** | **3** | **2** | **0** | **0** | **3** | **0** | **3** | **3** | **0** | **3** | **2** |
| 2 | CO2 | **0** | **0** | **0** | **2** | **0** | **0** | **0** | **0** | **3** | **0** | **3** | **3** | **0** | **3** | **2** |
| 3 | CO3 | **0** | **3** | **3** | **2** | **3** | **0** | **0** | **0** | **3** | **0** | **3** | **3** | **0** | **3** | **2** |
| 4 | CO4 | **0** | **3** | **3** | **2** | **3** | **0** | **0** | **0** | **3** | **0** | **3** | **3** | **0** | **3** | **2** |
| 5 | CO5 | **0** | **3** | **3** | **2** | **3** | **2** | **0** | **0** | **3** | **0** | **3** | **3** | **0** | **3** | **2** |
| SYLLABUS |
| No. | Content | Hours | COs |
| I | To find the turbidity and colour of a given sample of water. | **1** | **CO1, CO3, CO5** |
| II | To determine the pH value of a given sample of water. | **1** | **CO1** |
| III | To determine the conductivity of a given sample of water | **1** | **CO1** |
| IV | To find out total dissolved solid, settle able solids and suspended solids of the given sample | **2** | **CO1, CO3, CO5** |
| V | To determine the carbonate, bicarbonate, and hydroxide alkalinity of a sample. | **2** | **CO1, CO3, CO5** |
| VI | To find out the concentration of chlorides in the given sample of water. | **1** | **CO1, CO3, CO5** |
| VII | To estimate the hardness of the given sample of water by standard EDTA method. | **2** | **CO1, CO3, CO5** |
| VIII | To find the optimum amount of coagulant required to treat the turbid water by Jar Test. | **2** | **CO1, CO3, CO5** |
| IX | To determine residual chlorine in a given sample of water. | **2** | **CO6** |
| X | To find the quantity of dissolved oxygen (DO) present in the given sample. | **2** | **CO4** |
| XI | To determine biochemical oxygen demand (BOD) exerted by the given waste water sample | **2** | **CO4** |
| XII | To determine Chemical oxygen demand (COD) exerted by the given waste water sample | **2** | **CO4** |
| XIII | To determine MPN of coliforms of the given sample. | **2** | **CO4** |
| XIV | To determine the metal & metalloids of the given sample. | **2** | **CO4** |
| Total Hours | **24** |  |
| **Essential Readings** |
| 1. APHA, Standard Methods Examination of Water and Wastewater, American Public Health Association, Washington DC, 22nd Edition.
 |
| 1. Metcalf & Eddy (Revised by G. Tchobanoglous, F. L. Burton and H. D. Stensel), “Wastewater Engineering Treatment and Reuse”, Tata McGraw Hill.4 th Edition
 |
| **Supplementary Readings** |
| 1. Peavy H. S., Rowe D. R. and George Tchobanoglous, “Environmental Engineering”, McGraw-Hill International.First Edition
 |
| 1. McGhee T. J ., “Water Supply and Sewerage”, McGraw-Hill Inc., 6th edition
 |
| 1. Davis M. L and Cornwell D. A “Introduction to Environmental Engineering”, McGraw-Hill, Inc.5 th Edition.
 |
| 1. Sawyer C. N., McCarty P. L and Parkin G. F., “Chemistry for Environmental Engineers”, McGraw- Hill. Fifth edition.
 |
| 1. Manual for Sewer and Sewerage, Central Public Health & Environmental Engineering Organization, Ministry of Housing and Urban Development, Govt. of India.
 |
| 1. Manual for water supply and treatment, Central Public Health & Environmental Engineering Organization, Ministry of Housing and Urban Development, Govt. of India.
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