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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** | | | | | | | | | | | | Year of Regulation | | | | | | | | | | **2019** | | | | | | |
| Department | | | **Civil Engineering** | | | | | | | | | | | | Semester | | | | | | | | | | **V** | | | | | | |
| Course  Code | | | Course Name | | | | Pre requisite | | | | | Credit Structure | | | | | | | | Marks Distribution | | | | | | | | | | | |
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| **CE 371** | | | **Solid Waste Management** | | | | **Nil** | | | | | **2** | | **0** | | | **0** | **2** | | **50** | | | **50** | | | **100** | | | | **200** | |
| Course  Objectives | | | 1. Understanding of problems of municipal waste. | | | | | | | | | **Course Outcomes** | | **CO1** | | | Able to describe solid waste management systems with respect to its physical properties, and associated critical considerations | | | | | | | | | | | | | | |
| 1. Knowledge of legal, institutional and financial aspects of management of solid wastes. | | | | | | | | |
| **CO2** | | | Able to outline the types, sources and composition of municipal solid waste with methods of handling and storage of solid waste. | | | | | | | | | | | | | | |
| 1. Become aware of Environment and health impacts solid waste mismanagement | | | | | | | | |
| **CO3** | | | Able to understand and develop the technical options for waste management | | | | | | | | | | | | | | |
| **CO4** | | | Able to understand the Environment and health impacts associated with solid waste mismanagement | | | | | | | | | | | | | | |
| 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** | **3** | **2** | | **3** | **3** | **3** | **2** | | **1** | | | **2** | | | **2** | | **2** | | | **3** | | | **2** | | | | **3** |
| 2 | CO2 | **3** | | **3** | **3** | **3** | | **3** | **3** | **3** | **1** | | **1** | | | **1** | | | **3** | | **2** | | | **3** | | | **2** | | | | **2** |
| 3 | CO3 | **3** | | **3** | **3** | **3** | | **2** | **3** | **3** | **1** | | **1** | | | **2** | | | **3** | | **2** | | | **2** | | | **2** | | | | **3** |
| 4 | CO4 | **2** | | **2** | **2** | **2** | | **1** | **3** | **3** | **1** | | **1** | | | **2** | | | **2** | | **2** | | | **1** | | | **1** | | | | **1** |
| SYLLABUS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. | Content | | | | | | | | | | | | | | | | | | | | | Hours | | | | | | | COs | | |
| I | Solid Waste introduction:  Origin, types, generation rates and composition; physical, chemical, biological and thermal characteristics. | | | | | | | | | | | | | | | | | | | | | **04** | | | | | | | **CO1** | | |
| **CO2** | | |
| II | Solid Waste Management System:  Collection, Storage, segregation, reuse and recycling possibilities, Transportation, Treatment / processing, final disposal. | | | | | | | | | | | | | | | | | | | | | **06** | | | | | | | **CO2** | | |
| **CO3** | | |
| III | Separation and transformation/treatment of solid waste:  Material separation and processing technologies; biological treatment techniques: conventional composting, vermicomposting, mechanical composting | | | | | | | | | | | | | | | | | | | | | **10** | | | | | | | **CO3** | | |
| **CO4** | | |
| IV | Final Disposal Techniques:  Landfill classification, types and methods, landfill siting consideration, characteristics, collection and use of landfill gas; composition, collection and treatment of leachate, Landfill design - an Overview. | | | | | | | | | | | | | | | | | | | | | **04** | | | | | | | **CO3** | | |
| **CO4** | | |
| Total Hours | | | | | | | | | | | | | | | | | | | | | | **24** | | | | | |  | | | |
| **Essential Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Tchhobanoglous, G., Theisen and Vigil, “Solid Waste Management: Engineering Principles and Management issues”, , McGraw Hill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Peavy, H. S., Rowe, D. R. and Tchhobanoglous, G,.”Environmental Engineering”, McGraw Hill International Ed. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Vesilind, P. A., Worrell, W. A. and Reinhart,D. R., “Solid Waste Engineering”, Thomson Brooks/Cole. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Wentz, C. A., “Hazardous Waste Management” , McGraw Hill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. John Pichtel, “Waste Management Practices: Municipal, Hazardous and Industria”, CRC Press, Taylor and Francis Group. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. LaGrega, M.D. Buckingham, P.L. and Evans, J.C., “Hazardous Waste Management”, McGraw Hill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Richard J. Watts, “Hazardous Wastes - Sources, Pathways, Receptors”, John Wiley and Sons, New York. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Manual on municipal solid waste management. Central Public Health and Environmental Engineering Organization, CPHEEO, New Delhi. http://www.indiawaterportal.org/articles/manual-municipal-solid-wastemanagement-cpheeo-moud | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |