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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 | **2019-20** |
| Department | **Civil Engineering** | Semester | **V** |
| CourseCode | Course Name | **Pre requisite** | Credit Structure | Marks Distribution |
| L | T | P | C | INT | MID | END | Total |
| **CE305** | **Hydrology and Water Resources Engineering** | **CE 204** | **3** | **1** | **0** | **4** | **50** | **50** | **100** | **200** |
| CourseObjectives | To develop the student’s knowledge on various processes ofhydrologic cycle with detail understanding of its components. | Course Outcomes | CO1 | Student will be able to understand the various components ofhydrologic cycle that affect the movement of water in the earth. |
| To provide some knowledge about various forms of precipitationsand representation of hydrological data. | CO2 | Student will demonstrate the ability to perform analysis andrepresentation of hydrological data. |
| To develop understanding of surface yield and rainfall-runoffmodel. | CO3 | Student will be able to understand various techniques for measurementof precipitation and estimate abstractions from precipitation. |
| To make the student understand hydrologic flood routing. | CO4 | Student will be able to compute yield from a catchment anddevelop rainfall-runoff model. |
| To provide knowledge about ground water flow and ground waterstorage. | CO5 | Student will be able to formulate and solve hydrologic floodrouting model. |
|  | CO6 | Student will be able to understand the concept of occurrence ofground water, and its movement and storage beneath the earth |
| 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** | **3** |
| 2 | CO2 | **3** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** |
| 3 | CO3 | **3** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** |
| 4 | CO4 | **3** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** |
| 5 | CO5 | **3** | **3** | **0** | **0** | **0** | **0** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** |
| 6 | CO6 | **3** | **3** | **0** | **0** | **0** | **0** | **3** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** |
| SYLLABUS |
| No. | Content | Hours | COs |
| I | **Introduction** Hydrology - definition & scope, Hydrologic cycle and its components, Hydrologic data variability, Hydrologic data analysis. | **04** | **CO1** |
| II | **Precipitation** Formation and types, Forms, Measurement, Estimating missing precipitation data, Average precipitation over area, Depth-area-duration analysis, Abstractions from precipitation, Evapotranspiration and its measurement, Infiltration and its measurement, Interception process. | **10** | **CO2** |
| **CO3** |
| III | **Runoff and Hydrograph** Runoff components, Drainage basin characteristics, Factor effecting runoff, Hydrograph and its components, Base flow separation, Unit hydrograph– concept, derivation, limitations and use, S-hydrograph, Synthetic unit hydrograph, Instantaneous unit hydrograph. | **14** | **CO3** |
| **CO4** |
| IV | **Floods** Definition, Flood estimation, Rational method and unit hydrograph method, Flood routing: reservoir routing and channel routing, Flood frequency analysis. | **10** | **CO4** |
| **CO5** |
| V | **Ground water hydrology** Occurrence of ground water, Aquifers, Movement of ground water, Darcy’s law, Porosity, specific yield and specific retention, Yield from wells for confined and unconfined aquifers, Yield of an open well. | **10** | **CO6** |
| Total Hours | **48** |  |
| **Essential Readings** |
| 1. V. T. Chow, D. R. Maidment and L. W. Mays, “Applied Hydrology”, McGraw Hill, 1st Edition, 1988.
 |
| 1. K. Subramanya, “Engineering hydrology”, McGraw Hill, 2nd Edition, 1994.
 |
| 1. S K Jain, P K Agarwal and V P Singh, “Springer Hydrology and Water resources of India”, 1st edition, 2007
 |
| **Supplementary Readings** |
| 1. V. P. Singh, “Elementary Hydrology”, Englewood Cliffs, NJ : Prentice Hall, 1stEdition, 1992.
 |
| 1. D. K. Tood and L. W. Mays, “Ground Water Hydrology”, Wiley India Pvt. Ltd, 3rdEdition, 2004.
 |
| 1. T Davie, Taylor and Francis,Fundamentals of Hydrology 2nd edition, 2008
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