|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Image result for nit meghalaya logo | | | **National Institute of Technology Meghalaya**  An Institute of National Importance | | | | | | | | | | | **CURRICULUM** | | | |
| Programme | | | **Master of Technology** | | | | | Year of Regulation | | | | | | **2018-19** | | | |
| Department | | | **Civil Engineering** | | | | | Semester | | | | | | **I** | | | |
| Course  Code | | Course Name | | Pre requisites | | Credit Structure | | | | | Marks Distribution | | | | | | |
| L | T | | P | C | INT | | MID | | END | | Total |
| **CE509** | | **Surface Water Hydrology** | | **None** | | **3** | **0** | | **0** | **3** | **50** | | **50** | | **100** | | **100** |
| Course  Objectives | | 1. To develop technical skills for modelling and quantifying hydrological processes. 2. To develop research capabilities so that the students completing the course shall be capable of pursuing further works on  water management, integrated water resources management, urban water management, flood control, managing  climate change impacts on the water cycle etc | | | Course Outcomes | | CO1 | | Able to formulate hydrological processes in mathematical terms | | | | | | | | |
| CO2 | | Able to work with and recognise the limitations of hydrological data | | | | | | | | |
| CO3 | | Able to employ mathematical and computational  techniques to solve real life hydrological problems. | | | | | | | | |
| CO4 | |  | | | | | | | | |
| CO5 | |  | | | | | | | | |
| SYLLABUS | | | | | | | | | | | | | | | | | |
| **No.** | **Content** | | | | | | | | | | | **Hours** | | | | **COs** | |
| I | **Introduction**  Basic Concepts | | | | | | | | | | | 06 | | | | CO1 | |
| II | **Hydrologic Processes**  Precipitation, Evaporation, Infiltration, Groundwater and stream flows. Reynolds Transport theorem. | | | | | | | | | | | 06 | | | | CO2 | |
| III | **Atmospheric water**  Circulation, Water vapor, Precipitatable water, Thunderstorm cell model. | | | | | | | | | | | 06 | | | | CO3 | |
| IV | **Hydrograph analysis**  Probability, risk and uncertainty analysis for hydrologic and hydraulic design | | | | | | | | | | | 06 | | | | CO4 | |
| V | **Flood routing**  Hydrologic and hydraulic routing - developing algorithms, Hydrologic real time forecasting. | | | | | | | | | | | 06 | | | | CO5 | |
| VI | **Urban hydrology**  Time series analysis. | | | | | | | | | | | 06 | | | | CO1 | |
| **Total Hours** | | | | | | | | | | | | **36** | | | |  | |
| **Essential Readings** | | | | | | | | | | | | | | | | | |
| 1. Chow, V.T., Maidment, D.R., and Mays, L.W., “Applied Hydrology”, McGraw Hill. | | | | | | | | | | | | | | | | | |
| 1. Todd, D.K., “Ground Water Hydrology”, Wiley. | | | | | | | | | | | | | | | | | |
| **Supplementary Readings** | | | | | | | | | | | | | | | | | |
| 1. Singh, V.P., “Elementary Hydrology”, Prentice Hall. | | | | | | | | | | | | | | | | | |
| 1. Raghunath, H.M., “Hydrology – Principles, Analysis and Design”, Wiley Eastern Ltd | | | | | | | | | | | | | | | | | |