Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

CE5210 - Transport of Water & waste water

Credit Distribution: C:9 L:3 T:0 P:0 E:0 O:6 TH:9

Course Type: Theory

Description: Transport of Water: Water Storage and Transmission: Storage requirements, impounding reservoirs, intakes, pressure conduits, hydraulics, pumps and pumping units, capacity and selection of water pumps, economic design of pumps and economic design of gravity and pumping mains. Materials for pipes: Specification for pipes, pipe appurtenances, types of loads and stresses, water hammer, causes and prevention, control devices. Distribution Systems : Principles of design, analysis of distribution networks, Hardy Cross, equivalent pipe and Newton Raphson methods, computer applications in distributions network analysis, optimal design of networks, maintenance of distribution systems, methods of control and prevention of corrosion, storage, distribution and balancing reservoirs. Transport of Wastewater: Sanitary Sewerage: Sanitation technology selection sanitary sewage flow estimation sanitary sewer materials hydraulics of flow in sanitary sewers partial flows sewer design sewer layouts, Concept of model based design hydraulic fundamentals of design models Basic properties and model formulations for the design of wastewater of collection system transitions in flow of sewage. Storm Drainage: Basic philosophy in storm drainage layouts storm runoff estimation rainfall data analysis hydraulics of flow in storm water drains storm water drain materials and sections design of storm drains storm water inlets. Operation & Maintenance : Maintenance requirements of sanitary sewerage and storm drainage systems manpower requirement equipment requirement; preventive maintenance monitoring safety requirements corrosion in sewers prevention and control Specific problems related to waste water pumping pump selection wastewater pumping networks.

Course Content: Water Supply Systems: Storage requirements, impounding reservoirs, intake structures, hydraulics of pressurized pipelines, pumping units (capacity and selection), economical design of gravity and pumping mains, analysis and design of distribution systems, distribution and balancing reservoirs, optimal design, pipe materials, appurtenances, design for external loads, basics of transients, maintenance and operation Sanitary Sewerage Systems: Sanitary sewage flow estimation, sewer materials, hydraulics of flow in sewers, sewer lay out, sewer transitions, materials for sewers, appurtenances, manholes, sewer design, conventional and model based design, sewage pumps and pumping stations, corrosion prevention, operation and maintenance, safety

Text Books: NIL

Reference Books: NIL

Prerequisite: NIL

Prepared in January 2021