Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

CE5160 - Biological Proc. design for Wastewater Treatment

Credit Distribution: C:12 L:4 T:0 P:0 E:0 O:8 TH:12

Course Type: Theory

Description: Waste waters Sources, nature and characteristics, Analysis of waste water determination of BOD, COD, Solids and volatile solids and their significance , BOD progression and its formulations, Fundamentals of Process Kinetics, Zero order, First order, Second order Reactions, Enzyme reactions Reactor Analysis, Completely mixed batch reactor, Continuous flow stirred tank reactor, Plug flow reactor, Arbitrary flow reactor Design of wastewater treatment systems Primary, secondary and tertiary treatments, Activated Sludge and its process modifications, Process design considerations, Evaluation of Bio kinetic Parameters. Biological Nitrification and denitrification Aeration, Fundamentals of gas transfer, Design of aeration systems Treatment Ponds and aerated Lagoons, aerobic pond, facultative pond, anaerobic ponds, polishing ponds etc. Attached Growth Biological Treatment Systems, Trickling Filters, Rotating Biological Contactors, Activated Bio filters etc. Anaerobic processes, Process fundamentals, Standard, high rate and hybrid reactors, Anaerobic filters, Expanded /fluidized bed reactors, Up flow anaerobic sludge blanket reactors, Performance and design aspects, Expanded granular bed reactors, Two stage/phase anaerobic reactors. Sludge Digestion, anaerobic digestion, and aerobic digestion Waste water reclamation and reuse, Effluent disposal.

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Text Books: NIL

Reference Books: NIL

Prerequisite: NIL

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