



PHYSICO-CHEMICAL PROCESSES FOR WASTEWATER TREATMENT

PROF. VIMAL CHANDRA SRIVASTAVA

Department of Chemical Engineering

IITRoorkee

TYPE OF COURSE : New | Elective | UG/PG

COURSE DURATION : 12 weeks (24 Jan' 22 - 15 Apr' 22)

EXAM DATE : April 23, 2022

PRE-REQUISITES : None

INTENDED AUDIENCE : Undergraduate, postgraduate and Ph.D. students of Environmental Engineering, Chemical Engineering and Civil Engineering.

COURSE OUTLINE :

This course is essential for Engineers, considering the expectation of the Industries for wastewater pollution control in their premises to comply with newer and more stringent laws and acts that are being enforced in India and globally. This course introduces the principles and physicochemical methods to control wastewater pollution. The course will be presented in a logical manner with several numerical problems and case studies so that the students may adequately understand the subject and apply the knowledge after their graduation in industry and higher studies. The topics to be covered include (but not limited to): Physical treatment, pre-treatment, solids removal by setting and sedimentation, aeration, filtration, centrifugation, coagulation and flocculation; Adsorption and ion-exchange; Membrane processes; Advanced Oxidation Processes.

ABOUT INSTRUCTOR :

Prof. Vimal Chandra Srivastava (emails: vimal.srivastava@ch.iitr.ac.in, vimalcsr@yahoo.co.in) is currently serving as a Professor in the Department of Chemical Engineering, Indian Institute of Technology (IIT), Roorkee, India. His major research interests are in Chemical & Environmental Engg., Wastewater Treatment, Desulfurization, Solid waste management, and Valorization of spent-adsorbents/catalysts/residues.

COURSE PLAN :

Week 1: Introduction to Water Pollution and Control

Week 2: Pre-treatment & Physical treatment: Flow equalization & Aeration

Week 3: Pre-treatment & Physical treatment: Coagulation and Flocculation

Week 4: Setting and Sedimentation & Settling Chamber Design

Week 5: Filtration & Filtration System Design

Week 6: Wastewater treatment by Adsorption & Ion Exchange

Week 7: Wastewater treatment by Membrane Based Technologies

Week 8: Advanced Oxidation Processes: Introduction

Week 9: Advanced Oxidation Processes: Fenton and catalytic treatment

Week 10: Advanced Oxidation Processes: Photo-induced processes

Week 11: Advanced Oxidation Processes: Sono- and Electro-chemical Treatment

Week 12: Case studies on wastewater treatment in various process, chemical and allied industries