



PLANT DESIGN AND ECONOMICS

PROF. DEBASIS SARKAR

Department of Chemical Engineering
IIT Kharagpur

TYPE OF COURSE : New | Core | UG**COURSE DURATION** : 12 weeks (20 Jul' 20 - 9 Oct' 20)**EXAM DATE** : 18 Oct 2020

PRE-REQUISITES : Basic Chemical Engineering courses such as: Fluid Mechanics, Heat Transfer, Mass Transfer, Chemical Reaction Engineering, Process Control

INTENDED AUDIENCE : Chemical Engineering, Chemical Technology, Biochemical Engineering, Environmental Engineering

INDUSTRIES APPLICABLE TO : This course may be of general interest to many chemical and allied process industries such as: (1) Indian Oil Corporation Ltd. (2) Hindustan Petroleum Corporation Ltd. (3) Haldia Petrochemicals Ltd. (4) Steel Authority of India Ltd.

COURSE OUTLINE :

This course covers two important aspects of Chemical Engineering: (a) the strategies used in the design of chemical processes, and (b) the basic economic analysis of a chemical plant. The objective of the course is to expose students to basic concepts in engineering economics, plant design, safety features and its importance to chemical engineering. By the end of the course, the students will be able to develop a chemical process and perform a complete economic analysis of the plant. Students will also appreciate the importance of safety in design and operation.

ABOUT INSTRUCTOR :

Prof. Debasis Sarkar is currently an Associate Professor at Chemical Engineering Department of Indian Institute of Technology Kharagpur. He received his BTech from Calcutta University, Master of Engineering from Indian Institute of Science, Bangalore, and PhD from Indian Institute of Science, Bangalore, all in Chemical Engineering. He was a Postdoctoral Fellow at University of Western Ontario, Canada. Prior to joining IIT Kharagpur, he worked with ICES Singapore and HBTI Kanpur. His current research interests are in applications of process systems engineering approaches for crystallization engineering and biosystems engineering. His teaching interests include, among others, optimization techniques, instrumentation and process control, advanced heat transfer.

COURSE PLAN :

Week 1: Process Design Aspects

Week 2: Selection of Process Equipment and Utilities

Week 3: Plant Location, Layout and Site Selection

Week 4: Engineering Economics - I

Week 5: Engineering Economics - II

Week 6: Conceptual Process Synthesis

Week 7: Reactor Network Synthesis

Week 8: Separation System Synthesis - I

Week 9: Separation System Synthesis - II

Week 10: Heat Exchanger Network Synthesis

Week 11: Chemical Process Safety

Week 12: Optimum Design and Production Scheduling