

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : VIII

CHEMICAL ENGINEERING

Subject Name: **PROCESS SIMULATION & OPTIMIZATION**

Sr. No.	Course Contents	Total Hrs
	CHEMICAL PROCESS SIMULATION	
1.	concepts of General simulation for process design- introduction, process simulation modes, sequential modular approach, recycle partitioning and tearing, simultaneous equation oriented approach, global equation approach and simulation examples.	12
2.	Process Plant Simulation: description of problem, steady state and dynamic simulation, simulation of continuous distillation, batch distillation, flow systems, reactors, controllers, process plants, start up and shutdown simulations.	15
	CHEMICAL PROCESS OPTIMIZATION	
3.	Problem Formulation: The nature and organization of optimization problems, Formulation of Objective functions.	3
4.	Optimization Theory and Methods: Basic concepts of optimization, optimization of unconstrained functions; one-dimensional search, unconstrained multi variable optimization, linear programming and applications, non-linear programming with constraints, optimization of stacked and discrete processes, numerical methods for optimization, introduction to advanced optimization techniques.	12
5.	Application of optimizations: Heat transfer and energy conservation, separation processes, fluid flow systems, chemical reactor design and operation etc.	12

Text Books:

1. Edgar Thomas, Himmelblau David, "Optimization of Chemical Processes" , 2nd Edition, McGraw Hill (2001)
2. Lorenz T. Biegler, Ignacio E. Grossmann, Arthur W. Westerberg, "Systematic Methods of Chemical Process Design", Prentice Hall of India.

Reference book :

1. Gordon S.G. Beveridge, Robert S. Schechter, "Optimization: Theory and Practice" McGraw Hill