

1.	Title of the course	Optimization Techniques
2.	Course number	CH502L
3.	Structure of credits	3-0-0-3
4.	Offered to	UG
5.	New course/modification to	Modification To CH5022/14
6.	To be offered by	Department of Chemical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	Course Objective(s): To introduce the fundamentals of optimization theory, and discuss solution methods to various classes of optimization problems.	
10.	Course Content: Introduction to optimization problems: cost function, constraints; Formulation for engineering applications; Convex sets and functions; Local and global optimality; Unconstrained optimization: optimality conditions, line search and trust region methods; Constrained optimization: Karush-Kuhn-Tucker conditions, concept of duality, method of Lagrange multipliers; Linear programming: simplex method; Quadratic programming: active set method; Nonlinear programming: sequential quadratic programming algorithm; Introduction to integer and stochastic optimization.	
11.	Textbook(s): 1. Nocedal O J and Wright S J, <i>Numerical Optimization</i> , 2nd Edition, Springer India (2006). 2. Rao S S, <i>Engineering Optimization: Theory and Practice</i> , 4th Edition, John Wiley & Sons (2009).	
12.	Reference(s): 1. Edgar T F, Himmelblau D M and Lasdon L S, <i>Optimization of chemical processes</i> , 2nd Edition, McGraw Hill (2001). 2. Ravindran A, Ragsdell K M and Reklaitis G V, <i>Engineering Optimization: Methods and Applications</i> , 2nd Edition, John Wiley & Sons (2006).	