

UG

Course Code: CH305

Credit: 4

Version: 1

Prerequisite Course: Nil

Department: **Chemical Engineering**

Course Name: **Optimization of Chemical Processes**

L-T-P: **3-1-0**

Approved on:

Formulation of the objective function.

Unconstrained single variable optimization: Newton, Quasi-Newton methods, polynomial approximation methods.

Unconstrained multivariable optimization: Direct search method, conjugate search method, steepest descent method, conjugate gradient method, Newton's method.

Linear Programming: Formulation of LP problem, graphical solution of LP problem, simplex method, duality in Linear Programming, two-phase method.

Non linear programming with constraints: Necessary and sufficiency conditions for a local extremum, Quadratic programming, successive quadratic programming, Generalized reduced gradient (GRG) method.

Use of MS-Excel and MATLAB for solving optimization problems.

Introduction to global optimization techniques.

Applications of optimization in Chemical Engineering.

Books

1. Edgar, T.F., Himmelblau, D. M., Lasdon, L. S., "*Optimization of Chemical Process*", 2nd ed., McGraw-Hill, 2001.
2. Rao, S. S., "*Optimisation Techniques*", Wiley Eastern, New Delhi, 1985.
3. Godfrey, C.O. and Babu, B.V., "*New Optimization Techniques in Engineering*", Springer-Verlag, Germany, 2004.
4. Beveridge, G. S. and Schechter, R. S., "*Optimization Theory and Practice*", McGraw- Hill, New York, 1970.
5. Reklaitis, G.V., Ravindran, A. and Ragsdell, K. M., "*Engineering Optimization- Methods and Applications*", John Wiley, New York, 1983.