
Course Title : OPTIMIZATION

- **Aim:**

This course is planned to teach students how to use optimization algorithms to improve the design and operation of chemical processes

- **Syllabus:**

- ✓ PART I: Problem Formulation Ch. 1: The Nature and Organization of Optimization Problems Ch. 2: Developing Models for Optimization Ch. 3: Formulation of the Objective Function
- ✓ Part II: Optimization Theory and Methods Ch. 4: Basic Concepts of Optimization Ch. 5: Optimization of Unconstrained Functions: One-Dimensional Search Ch. 6: Unconstrained Multivariable Optimization Ch. 7: Linear Programming (LP) and Applications Ch. 8: Nonlinear Programming with Constraints Ch. 9: Mixed-Integer Programming Ch. 10: Global Optimization for Problems with Continuous and Discrete Variables
- ✓ Part III: Applications of Optimization Ch. 11: Heat Transfer and Energy Conservation Ch. 12: Separation Processes Ch. 13: Fluid Flow Systems Ch. 14: Chemical Reactor Design and Operation Ch. 15: Optimization in Large-Scale Plant Design and Operations Ch. 16: Integrated Planning, Scheduling, and Control in the Process Industries

- **Reading Resources:**

- ✓ T.F. Edgar, D.M. Himmelblau, L.S. Lasdon, Optimization of chemical processes, 2nd ed., McGraw-Hill 2001.
- ✓ O. Levenspiel, Chemical reaction engineering, 3rd ed., Wiley, 1999