Course Name: Operations Research
Course Number: 20308
Credit: 4

Course Content (outline):
1. Modeling
   - Overview, Model Classification, Formulation of Linear Programming, Classification of Mathematical Programming Models
2. Linear Programming
   - Simplex Method, Linear Programs with Bounded Variables, Linear Programming in Matrix Form, Revised Simplex Method
3. Sensitivity Analysis
   - Shadow Prices, Reduced Costs, Variations in Objective Coefficients and Righthand-Side Values, Simultaneous Variations Within the Ranges, Parametric Programming
4. Duality
   - Definition of the Dual Problem, Duality Properties, The Dual and Primal-Dual Simplex Method, Duality in Mathematical Economics, Application of Duality in Game Theory
5. Introduction to Graph Theory
   - The Definition, Directed Graph, Computer Representation of Graphs and Digraphs, Walks, Trails, Paths and cycles, Basic properties, Examples.
6. Networks
   - General Network-Flow Problem, Special Network Models, Simplex Method for Networks, Special Methods for Solving Network Problem
7. Integer Programming
   - Integer-Programming Models, Formulating Integer Programs, Sample Problems, Branch-and-Bound Procedure, Cutting Planes Procedure
8. Large-Scale Systems
   - Large-Scale Problems, Decomposition Method, Column Generation Method
9. Practical Applications of Mathematical Programming
   - Example of Problems

References:

Some Other Useful References
11. Lasdon, Optimally Theory for Large Systems.