

DSE-2(iii), and GE-4(ii) (Generic Elective): Linear Programming

Weeks 1 and 2: Standard form of the LPP, graphical method of solution, basic feasible solutions, and convexity.

[1]: Chapter 2 (Section 2.2).

[1]: Chapter 3 (Sections 3.1, 3.2, and 3.9).

Weeks 3 and 4: Introduction to the simplex method: Optimality criterion and unboundedness, Simplex tableau and examples.

[1]: Chapter 3 (Sections 3.3, 3.4, and 3.5).

Weeks 5 and 6: Artificial variables, Introduction to duality, Formulation of the dual problem with examples.

[1]: Chapter 3 (Section 3.6).

[1]: Chapter 4 (Sections 4.1, 4.2, and 4.3 [Examples 4.3.1, and 4.3.2]).

Weeks 7 to 9: Definition of transportation problem, finding initial basic feasible solution using Northwest-corner method, Least-cost method, and Vogel approximation method; Algorithm for solving transportation problems (Only minimization, balanced and non-degenerate transportation problems to be done).

[2]: Chapter 5 (Sections 5.1, and 5.3).

Weeks 10 and 11: Hungarian method of solving assignment problem.

[2]: Chapter 5 (Section 5.4).

Weeks 12 to 15: Introduction to game theory, rectangular games, Mixed strategies, Dominance principle; Formulation of game to primal and dual linear programming problems.

[1]: Chapter 9 (Sections 9.1, 9.3, 9.4, and 9.6).

[2]: Chapter 15 (Section 15.4).

Essential Readings

1. Thie, Paul R., & Keough, G. E. (2014). *An Introduction to Linear Programming and Game Theory*. (3rd ed.). Wiley India Pvt. Ltd.
2. Taha, Hamdy A. (2017). *Operations Research: An Introduction* (10th ed.). Pearson.