Programme: B.Sc. Degree Class: B.Sc.	Year: III	Semester: V
Subject: Mathematics		
Course Code:	**Course Title:Linear Programming**	

Course Outcome	CO1: Develops ability to formulate real world problems as different types of linear programming problems. CO2: Develops ability to solve different types of linear programming problems by employing various techniques. CO3: Develops ability to analyse the effect of changes in various parameters on the optimal solutions of LPP.	
Unit No.	Course Content	Hours
I	Linear programming problems, Mathematical formulation of real world problems, Convex sets, Supporting and separating hyper-planes, extreme points, Graphical solution of two variable Linear Programming Problems.	8
II	Basic feasible solutions, Theory of simplex method, Feasibility and optimality conditions, Simplex algorithm, Simplex method in tableau format, Artificial variable techniques: two-phase method, Big-M method, Cases of different types of solutions.	8
III	Duality Theory, Formulation of the Dual Problem, Primal-Dual Relationship, Duality and Simplex Method, Dual Simplex Method, Sensitivity Analysis.	8
IV	Transportation problem and its mathematical formulation, triangular basis, northwest-corner method, least cost method and Vogel approximation method for determination of starting basic solution, UV algorithm for solving transportation problem.	8
V	Assignment problem and its mathematical formulation, Hungarian method for solving assignment problem, Travelling salesman problem.	8

Suggested Readings:

1. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, *Linear Programming and Network Flows*, 2nd Ed., John Wiley and Sons, India, 2004.
2. F.S. Hillier and G.J. Lieberman, *Introduction to Operations Research,* 9th Ed., Tata McGraw Hill, Singapore, 2009.
3. Hamdy A. Taha, *Operations Research, An Introduction,* 8th Ed., Prentice---Hall India, 2006.

Mapping of course outcomes with program outcomes & program specific outcomes

CO's No.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	1	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	2	3	2	3	3