OPEI	RATIONS RESEA	RCH		
As per Choice Ba	sed Credit Systen	n (CBCS) scheme]		
	n the academic ye SEMESTER – VI	ar 2016 -2017)		
Subject Code	15CS653	IA Marks	20	
Number of Lecture Hours/Week	3	Exam Marks	80	
Total Number of Lecture Hours	40	Exam Hours	03	
	CREDITS - 03			
Course objectives: This course will	enable students to			
 Formulate optimization probl 	em as a linear prog	ramming problem.		
• Solve optimization problems	using simplex meth	nod.		
 Formulate and solve transport 	tation and assignm	ent problems		
 Apply game theory for decisi 	on making problem	ns.		
Module – 1				Teaching
Introduction				Hours
Introduction, Linear Programmi	ng: Introduction:	The origin, natur	re and	8 Hours
impact of OR; Defining the pro	blem and gatheri	ng data; Formula	ting a	
mathematical model; Deriving solu Preparing to apply the model; Imples	itions from the m	odel; Testing the	model;	
Introduction to Linear Program	nentation.	DD) D	- 5- 15- 1	
Introduction to Linear Programs Assumptions of LPP, Formulation	uning Problem (L	PP): Prototype ex	ample,	
examples.	i of LPP and G	raphical method v	various	
Module – 2				
Simplex Method - 1: The essence of	of the simpley meth	od: Setting up the s	implan	0.17.
Simplex Method -1 : The essence of method; Types of variables, Algebra	of the simplex me	thad the cimplar .	mathad	8 Hours
in tabular form; Tie breaking in the	of the simplex me	thad the cimplar .	mathad	8 Hours
in tabular form; Tie breaking in the method.	of the simplex me	thad the cimplar .	mathad	8 Hours
in tabular form; Tie breaking in the method. Module – 3	of the simplex method, I	ethod; the simplex in Big M method, Two	method phase	
in tabular form; Tie breaking in the method. Module – 3 Simplex Method – 2: Duality The	simplex method, I	Big M method, Two	method o phase	0.17
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of print	simplex method, I	Big M method, Two	method o phase	0.17
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prin simplex method.	simplex method, I	Big M method, Two	method o phase	0.17
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prir simplex method. Module - 4	eory - The essence	ethod; the simplex of duality theory, and vice versa. The	Primal he dual	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prinsimplex method. Module - 4 Transportation and Assignment F	cory - The essence	ethod; the simplex is Big M method, Two sof duality theory, in and vice versa. The sportation problem	Primal he dual	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prir simplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by	cory - The essence mal to dual problems: The trans	ethod; the simplex is Big M method, Two sof duality theory, in and vice versa. The sportation problem mer. Rule, method	Primal he dual	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prinsimplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim	cory - The essence mal to dual problems: The trans a North West Cornation Method. One	ethod; the simplex range of Market Ma	Primal he dual , Initial Matrix	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prinsimplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The	cory - The essence mal to dual problems: The trans North West Cornation Method. Opt	ethod; the simplex of Big M method, Two soft duality theory, in and vice versa. The sportation problem mer Rule method, simal solution by M m. A Hungarian ale	Primal he dual , Initial Matrix lodified	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prin simplex method. Module - 4 Transportation and Assignment F Basic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mi	cory - The essence mal to dual problems: The trans North West Cornation Method. Opt Assignment problem imization and Method in the content of	ethod; the simplex of Big M method, Two soft duality theory, in and vice versa. The sportation problem mer Rule method, simal solution by M m. A Hungarian ale	Primal he dual , Initial Matrix lodified	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prinsimplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mitransportation and assignment problem.	cory - The essence mal to dual problems: The trans North West Cornation Method. Opt Assignment problem imization and Method in the content of	ethod; the simplex of Big M method, Two soft duality theory, in and vice versa. The sportation problem mer Rule method, simal solution by M m. A Hungarian ale	Primal he dual , Initial Matrix lodified	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prinsimplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mitransportation and assignment problem Module - 5	cory - The essence mal to dual problems: The trans North West Cornation Method. Opt Assignment problemimization and Mems.	ethod; the simplex of Big M method, Two sof duality theory, in and vice versa. The sportation problem mer Rule method, simal solution by M m; A Hungarian algumation varies	Primal he dual , Initial Matrix lodified gorithm eties in	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prinsimplex method. Module - 4 Transportation and Assignment F Basic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mittransportation and assignment problem Module - 5 Game Theory: Game Theory: The	cory - The essence mal to dual problems: The trans North West Cornation Method. Opt Assignment proble nimization and Nems.	ethod; the simplex is Big M method, Two Big M method, Two Big M method, Two Is of duality theory, in and vice versa. The sportation problem mer Rule method, simal solution by M m; A Hungarian algumation varies of persons, zero sum of persons.	Primal he dual , Initial Matrix lodified gorithm eties in	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prinsimplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mitransportation and assignment problem. Mitransportation and assignment problem. Module - 5 Game Theory: Game Theory: The saddle point, maximin and minimax	cory - The essence mal to dual problems: The trans North West Cornation Method. Opto Assignment problemimization and Mems.	ethod; the simplex of Big M method, Two Big M method, Two Big M method, Two Big Mality theory, of and vice versa. The sportation problem mer Rule method, simal solution by M m; A Hungarian algorithm was a pressons, zero sum simple games, a pressons, zero sum simple games, a pressons.	Primal he dual , Initial Matrix lodified gorithm eties in	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prir simplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mi transportation and assignment problem Module - 5 Game Theory: Game Theory: The saddle point, maximin and minimax example; Games with mixed strateg	cory - The essence mal to dual problems: The trans North West Cornation Method. Opt Assignment problems. formulation of two principle, Solving ies; Graphical solving ies;	ethod; the simplex of Big M method, Two Big M method, Two Big M method, Two Big M method, and vice versa. The sportation problem mer Rule method, simal solution by M m; A Hungarian algorithm waries of persons, zero sum simple games- a procedure.	Primal he dual , Initial Matrix lodified gorithm eties in games; rototype	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prinsimplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mitransportation and assignment problem. Mitransportation and assignment problem. Module - 5 Game Theory: Game Theory: The saddle point, maximin and minimax example; Games with mixed strateg Metaheuristics: The nature of	cory - The essence mal to dual problems: The trans North West Cornation Method. Opt Assignment problems. formulation of two principle, Solving ies; Graphical solving ies;	ethod; the simplex of Big M method, Two Big M method, Two Big M method, Two Big M method, and vice versa. The sportation problem mer Rule method, simal solution by M m; A Hungarian algorithm waries of persons, zero sum simple games- a procedure.	Primal he dual , Initial Matrix lodified gorithm eties in games; rototype	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prir simplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mi transportation and assignment problem Module - 5 Game Theory: Game Theory: The saddle point, maximin and minimax example; Games with mixed strateg	cory - The essence mal to dual problems: The trans North West Cornation Method. Opt Assignment problems. formulation and Mems. formulation of two principle, Solving ies; Graphical solumes; Metaheuristics,	ethod; the simplex of Big M method, Two Big M method, Two Big M method, Two Big M method, and vice versa. The sportation problem mer Rule method, simal solution by M m; A Hungarian algorithm waries of persons, zero sum simple games- a procedure.	Primal he dual , Initial Matrix lodified gorithm eties in games; rototype	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prinsimplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mitransportation and assignment problem. Mitransportation and assignment problem. Module - 5 Game Theory: Game Theory: The saddle point, maximin and minimax example; Games with mixed strateg Metaheuristics: The nature of Annealing, Genetic Algorithms. Course outcomes: The students sho	cory - The essence mal to dual problems: The trans North West Cornation Method. Opto Assignment problem imization and Mems. formulation of two principle, Solving ies; Graphical solumetaheuristics, ould be able to:	ethod; the simplex of Big M method, Two sof duality theory, in and vice versa. The sportation problem mer Rule method, simal solution by M m; A Hungarian algorithm and the simple games of persons, zero sum simple games a protion procedure. Tabu Search, Single Big Maximization waries and simple games.	Primal he dual , Initial Matrix lodified gorithm eties in games; rototype	8 Hours
in tabular form; Tie breaking in the method. Module - 3 Simplex Method - 2: Duality The dual relationship, conversion of prir simplex method. Module - 4 Transportation and Assignment Pasic Feasible Solution (IBFS) by Minima Method, Vogel's Approxim Distribution Method (MODI). The for the assignment problem. Mi transportation and assignment problem Module - 5 Game Theory: Game Theory: The saddle point, maximin and minimax example; Games with mixed strateg Metaheuristics: The nature of Annealing, Genetic Algorithms.	cory - The essence mal to dual problems: The trans North West Cornation Method. Opt Assignment problem imization and Mems. formulation of two principle, Solving ies; Graphical solumes; Graphical solumes in techniques for variation techniques for variation in the simplex method, I in the simplex method in the simplex method, I in the simplex method in the simplex method, I in the simplex method in the simplex m	ethod; the simplex of Big M method, Two sof duality theory, and vice versa. The sportation problem mer Rule method, simal solution by M m; A Hungarian algorization varies of persons, zero sum simple games- a protion procedure. Tabu Search, Signations problems	Primal he dual , Initial Matrix lodified gorithm eties in games; rototype mulated	8 Hours

Question paper pattern:

The question paper will have TEN questions.

There will be TWO questions from each module.

Each question will have questions covering all the topics under a module.

The students will have to answer FIVE full questions, selecting ONE full question from each module.

Text Books:

1. D.S. Hira and P.K. Gupta, Operations Research, (Revised Edition), Published by S. Chand & Company Ltd, 2014

Reference Books:

- 1. S Kalavathy, Operation Research, Vikas Publishing House Pvt Limited, 01-Aug-2002
- 2. S D Sharma, Operation Research, Kedar Nath Ram Nath Publishers.

Dept. Of Computer Science & Engineering Alva's Institute of Engg. & Yechnology Mijar, MOODBIDRI - 574 225