

GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Department of Computer Science and Engineering

Academic Year: **2016-17**

Semester: **EVEN**

COURSE PLAN

Semester: **VI**

Subject Code& Name: **10CS661 & OPERATIONS RESERACH**

Name of Subject Teacher: **J.SOMASEKAR**

Name of Subject Expert (Reviewer): **SUPARNA**

For the Period: From: 13-02-17 to 02-06-17

Details of Book to be referred:

Text Books	T1: Frederick S. Hillier and Gerald J. Lieberman, Introduction to Operations Research, 8th Edition, Tata McGraw Hill, 2005.
Reference Books	R1: S.Kalavathy, Operations Research, 4 th edition, vikas publishing house Pvt.Ltd. R2: Hamdy A Taha: Operations Research: An Introduction, 8 th edition, pearson education, 2007.

Lecture No	Topic Planned	Practical Applications & Brief objectives	Book refereed with page no.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	Introduction to the subject OR UNIT-1 : Linear Programming : Introduction	Objective: Introduce the concept of Linear programming and solving by using graphical method.	T1:1-2	13-02-17				

2.	Scope and limitations of OR. Also applications of OR	<p>Also formulation of LPP for the data provided by the organization for optimization</p> <p>Application: minimization of product cost, maximization of profit in company (or) industry</p> <p>Outcome: Able to understand the need of LPP , formulation of LPP for given data and solution of LPP by graphical method</p>	T1: 1-4 T2:2,4	14-02-17				
3.	Mathematical model of LPP and solution by graphical method		T1: 27-35 T2:19-23	15-02-17				
4.	LPP problems solutions by graphical method.		T1: 27-33 T2:21-24	16-02-17				
5.	Special cases of graphical method solution namely unbound solution, no feasible solution and multiple solutions.		T1: 27-33 T2:25-26	20-02-17				
6.	Various illustrations of special cases of graphical method		T1: 27-35 T2:25-26	21-02-17				
7.	General formulation of LPP for the given information		T1: 25-26 T2:7-11	22-02-17				
8.	Various illustrations of mathematical model of LPP for given data		T1: 45 T2:7-11	23-02-17				
9.	Combination of formulation and its solution by graphical method. Also previous questions papers discussion.		T1:78-79 T2:28	27-02-17				
10.	UNIT – 2: Simplex method-1: Slack and surplus variables to make standard form of LPP		<p>Objective: To find the solution of LPP for more than two variables</p>	T1:97-99 T2: 32-34	28-02-17			
11.	Algorithm of simplex method for solution of given LPP	T1:105-109 T2: 35-37		01-03-17				
12.	Solution of LPP by simplex method for finding optimal	T1: 110-120		02-03-17				

	value	Application: industry, Business, Defense for optimization						
13.	Solution of LPP by simplex method with two or more variables problems		T1: 123-134	03-03-17				
14.	If the objective function is minimization then finding solution of LPP by simplex method.	Outcome: To Understand the concept of simplex method and find the solution of LPP by using simplex method	T1: 133-137	04-03-17				
15.	Set of feasible solutions for the given linear equations. Also solution is degenerate or not.		T1: 140-148 T2: 36-40	06-03-17				
16.	Various special cases of simplex method.		T2:40-45	07-03-17				
17.	Tie breaking in simplex method.		T2:42-46	08-03-17				
18.	Revision / discussing previous years question papers problems.		T2:42-46	13-03-17				
19.	Unit-3: Simplex method-2: Artificial variables and standard form of LPP by using artificial variables.	Objective: The main objective of this unit is to find optimal value of the LPP by using Big-M method and two-phase method. Also need of artificial variables. Application: Industry, economics, agriculture, defense for finding optimal value	T1: 120-124 T2: 47-51	14-03-17				
20.	Big-M method algorithm for solution of LPP		T1: 120-123 T2:51-56	15-03-17				
21.	Solution of LPP by using Big-M method		T1: 124-126	16-03-17				
22.	Penalty method with more than two variables with more than two constraints		T1: 12 T2:50-58	17-03-17				
23.	No feasible solution case by using penalty method		T1: 126-129	20-03-17				

24.	Solution of LPP when inequality having equal sign	Outcome: Able to understand the artificial variables and for solving LPP having equal to sign by using Big-M and two-phase method.	T1: 592-597	21-03-17				
25.	Post optimality analysis		T1: 134-145	22-03-17				
26.	Unit Test (UT)-1		T1: 142-149	23-03-17				
27.	UNIT – 4 : Revised Simplex Method: Introduction Algorithm for two-phase simplex method	Objective: To find solution of LPP by revised simplex method and essence of duality theory Application: Design problems, defense, bioengineering Outcome: To understand the revised simplex method for solution of LPP.	T1:174-180 T2: 90-92	27-03-17				
28.	Solution of given LPP by using two-phase simplex method		T1:180-190 T2: 92-95	28-03-17				
29.	Finding degenerate feasible solution by using two-phase simplex method		T2: 95-98	30-03-17				
30.	Miscellaneous cases of two phase method		T2: 100-102	31-03-17				
31.	Revised simplex method algorithm		T2:100-102	03-04-17				
32.	Solution of LPP by using revised simplex method		T1: 179-184	04-04-17				
33.	Previous question papers discussion			05-04-17				

34.	UNIT – 5 :Duality in linear programming : Primal and dual problem. Definition of dual problem.	<p>Objective: It presents the concept of duality and solution of dual problem by dual simplex method.</p> <p>Application: Marketing, production management, military operations</p> <p>Outcome: Able to understand duality and dual simplex method</p>	T1: 21-215	06-04-17					
35.	Algorithm for converting primal to dual problem and also special cases of duality		T1:217-220 T2: 69-72	07-04-17					
36.	Dual simplex method algorithm		T1:26-270 T2: 72-75	10-04-17					
37.	Solution of LPP by using dual simplex method.		T2: 78-81	11-04-17					
38.	Solution of different types of LPP by using dual simplex method		T2: 81-84	12-04-17					
39.	Concept of sensitivity analysis		T2: 85-89	13-04-17					
40.	Special cases of sensitivity analysis and problems.		T2: 78-89	20-04-17					
41.	Unit test-2			21-04-17					
42.	Unit -6: Transportation and assignment problem: Introduction of TP and AP, mathematical formulation. Solution of TP by NWCM		Objective: To know the importance of transportation and assignment problem for optimization	T1:332-335 T2: 144-146	24-04-17				

43.	Algorithm of minimum cost method for finding solution of given TP	<p>Application: Agriculture, research and development, defense , industry</p> <p>Outcome: To find the solution of transportation and assignment problems (both balanced and unbalanced problems) for minimizing cost of transportation</p>	T1:337-339 T2: 144-148	25-04-17				
44.	Penalty method for finding solution of TP		T1:340-348 T2: 148-151	26-04-17				
45.	Numerical examples of all methods for finding TP and comparison of optimal cost of transportation		T1:332-335 T2: 152-154	27-04-17				
46.	Concept of assignment problem. Also difference between TP and AP		T1:332-335 T2: 154-157	28-04-17				
47.	Hungarian method for solution of AP		T1:345-350 T2: 145-154	02-05-17				
48.	Miscellaneous problems of AP and TP		T1:367-384 T2: 157-168	03-05-17				
49.	UT-3			04-05-17				
50.	Unit -7: Game theory: Introduction of game theory, features, limitations and pay off matrix.	<p>Objective: It focuses on modeling of pay-off matrix and the solution of game by different methods for value of the game.</p> <p>Application: Artificial intelligence, resource allocation and networking</p> <p>Outcome: To understand the concept of game and</p>	T1:715-717 T2: 428-430	05-05-17				
51.	Maxima and minima principle of pay off matrix. also finding value of the game using saddle point		T1:717-720 T2: 430-433	08-05-17				
52.	Games with pure strategies and solution of gamer		T1:718-720 T2: 429-434	09-05-17				
53.	Dominance principle with examples		T1:720-724 T2: 431-434	10-05-17				
54.	Graphical method for finding value game		T2: 435-438	11-05-17				
55.	Algorithm for solving mx2 game		T2: 438-440	12-05-17				

56.	Concept of decision making analysis	its solution by different methods for optimal strategies	T1:720-730	18-05-17				
57.	Tutorial (miscellaneous problems)		T2: 430-445	19-05-17				
58.	Unit test or discussion various illustrations of games. Revision/Class Test		T2: 430-445	22-05-17				
59.	UNIT – 8 : Metaheuristics Concept of heuristics and metaheuristics. Also objective and advantages.	Objective: To understand the nature of metaheuristics and tabu search algorithms Application: algorithms, computer vision. Outcome: Able to Understand how to solve travelling salesman problems by Tabu search algorithm and necessity of genetic algorithms	T1:670-672	23-05-17				
60.	Simulated annealing. Algorithm of annealing.		T1: 673-675	24-05-17				
61.	Travelling salesman problem		T1: 670-679	25-05-17				
62.	Pseudocode of tabu search algorithm		T1: 680-685	25-05-17				
63.	Concept of genetic algorithm		T1: 685-690	26-05-17				
64.	Problems using genetic algorithm		T1: 690-707	29-05-17				
65.	Revision	VTU Question papers discussion , doubt clarification, solving problems		30-05-17				
66.	Revision			01-06-17				
67.	Revision			02-06-17				

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