15MA317E	OPTIMIZATION TECHNIQUES	L	T	P	C
		3	0	0	3
Co-requisite:	NA				
Prerequisite:	15MA102 (or) 15MA104 (or) 15MA205B				
Data Book / Codes/Standards	Yes				
Course Category	E ELECTIVE MATHEMATICS				
Course designed by	Department of Mathematics				
Approval	-- Academic Council Meeting -- , 2016				

PURPOSE	To understand and apply optimization techniques to industrial operations		
INSTRUCTIONAL OBJECTIVES		**STUDENT OUTCOMES**	
At the end of the course, student will be able to			
1.	Identify the optimization of resources and apply techniques to industrial problems.	a	e
2.	Predict the life time of replacement items	a	e
3.	Ascertain the optimal sequence to do the jobs through the machinesand CPM-PERT Network models.	a	e
4.	To know the goal of inventory control	a	e
5.	Employ the concept of Transportation and Assignment problems.	a	e

Session	Description of Topic	Contact hours	C-D-I-O	IOs	Reference
	UNIT I: LINEAR PROGRAMMING PROBLEM	**9**			
1.	Formulation of an LPP model	1	C, I	1	1-7
2.	Graphical Method of LPP	2	C, I	1	1,3,4,6
3.	Simplex algorithm- Maximization case	2	C, I	1	1,3,4,6
4.	Simplex algorithm- Minimization case	2	C, I	1	1,3,4,6
5.	Artificial variable techniques	2	C, I	1	1,3,4,6
	UNIT II: REPLACEMENT AND GAME THEORY	**9**			
6.	Replacement of items that deteriorate with time and value of money remains constant	2	C, I	2	1,3,4,6
7.	Replacement of items which do not deteriorate with time and equipment that fails suddenly	2	C, I	2	1,3
8.	Two person zero sum games	1	C, I	2	1,3
9.	Saddle point, pure strategies, mixed strategies and dominance property	2	C, I	2	1,3,4,6
10.	Graphical method for 2 x n and m x 2 games	2	C, I	2	1,5,6
	UNIT III: RESOURCE SCHEDULING AND NETWORK ANALYSIS	**9**			

11.	Sequencing problem :Models with n jobs through two machines	2	C, I	3	2,5,7
12.	Sequencing problem :Models with n jobs through three machines	2	C,I	3	2,5,7,1
13.	Sequencing problem :Models with n jobs through m machines	1	C,I	3	2,5,7
14.	Critical Path Method (CPM)	2	C,I	3	1,2
15.	PERT in network	2	C,I	3	1,2
	UNIT IV: INVENTORY CONTROL	**9**			3.6
16.	Inventory models – Introduction, Economic ordering quantity, Reorder level.	2	C,I	4	7
17.	Deterministic models – Purchasing model with no shortages	2	C,I	4	1,5,6
18.	Deterministic models –Manufacturing model with no shortages	1			
19.	Deterministic models – Purchasing model with shortages	2	C,I	4	4,5
20.	Deterministic models – Manufacturing model with shortages	1			
21.	Optimum cost	1	C,I	4	1,2
	UNIT V: ADVANCED LINEAR PROGRAMMING	**9**			
22.	Initial basic solution of transportation problem by Vogel's Approximation Method	2	C,I	5	3,4
23.	Optimality test- MODI method	2	C,I	5	3, 4
24.	Unbalanced transportation problem	2	C,I	5	3,4
25.	Degenerate solution	1	C,I	5	3,4
26.	Assignment problem- Hungarian method	1	C,I	5	3, 4
27.	Travelling salesman problem	1	C,I	5	3, 4
	Total contact hours	**45**			

LEARNING RESOURCES	
Sl. No.	**TEXT BOOKS**
1.	KantiSwarup, Gupta P. K., and Man Mohan, *Operations Research,* Sultan Chand & Sons, 1994.
	REFERENCE BOOKS/OTHER READING MATERIAL
2.	Gupta, P.K., and Hira, D.S., *Operations Research*S.Chand& Sons., 2000.
3.	Sundaresan.V, Ganapathy Subramanian. K.S. and Ganesan.K, *Resource Management Techniques*, A.R. Publications, 2002
4.	Sharma S.D., *Operations Research,* KedarnthRamnath& Co., Meerut 1994
5.	Taha, H.A, *Operations Research - An Introduction*, 7th edition, Prentice Hall of India, New Delhi.
6.	Gupta P. K., and Manmohan, *Operations Research and Quantitative Analysis* – S. Chand &Co. New Delhi.
7.	Billy B. Gillet., *Introduction to Operations Research*, TMH Publishing and Co.

Course nature				**Theory**			
Assessment Method (Weightage 100%)							
In-semester	**Assessment tool**	Cycle test I	Cycle test II	Cycle Test III	Surprise Test	Quiz	**Total**
	Weightage	**10%**	**15%**	**15%**	**5%**	**5%**	**50%**
						End semester examination Weightage :	**50%**