Course code	Course Name	L-T-P -Credits	Year of Introduction
MA484	OPERATIONS RESEARCH	3-0-0-3	2016

Prerequisite: NIL

Course Objectives:

1. To understand the fundamentals of Operation Research
2. To acquire the knowledge in different Operation Research techniques

Syllabus: Linear programming problem-Basic feasible solutions- Degeneracy dual Linear programming problems. Optimality conditions-The Simplex Method. Artificial Variables-Charnes'M method-Two phase Method. Dual of Linear programming problems- Duality principle, The Primal-Duality solutions using Simplex Method. Revised Simplex method. Assignment Problem-Formation-Optimal Solution-Hungarian Assignment Method-Traveling salesman problem-sequencing problem-Basic terms used in sequencing-Processing n Jobs through Two Machines-Processing n Jobs through k machines-Processing 2 Jobs through k Machines. Project management: Guidelines for network construction. Critical path method. (CPM). Project evaluation and review technique.(PERT). Network Techniques: Shortest path problem. (Dijkstras Algorithm). Maximum flow problem. Minimum spanning tree problem. Prim algorithm. The Recursive Equation approach- Characteristics of Dynamic programming-Dynamic programming Algorithm-Solution of Discrete D.P.P-Some applications-Solution of L.P.P by Dynamic Programming

Expected Outcome

Students will be able to

1. Solve different type LPP
2. Apply the concept of O.R in real life problems
3. Understand how to translate a real-world problem, given in words, into a mathematical formulation
4. Understand design and analysis of algorithms in network techniques and project management.

Text Books:

1. G Hadley, Linear programming, Narosa Publishing House, New Delhi, 2002
2. Kanti Swarup, P.K.Guptha, Man Mohan, Operations Research, Sultan Chand & Sons, New Delhi, 2010.
3. Taha.H.A, OperationResearch, Pecarson, 2004

References:

1. Francis & White, Facility Layout & Location, Prentice Hall Inc., 1974
2. Hillier & Lieberman, Introduction to Operations Research, Holden Day Inc., 1996
3. R Panneerselvam, Operation Research. PHI, 2006
4. Samuel Eilon, Elements of Production Planning & Control, Universal Book, 1991. Corporation

Module	Syllabus	Hours	End Sem. Exam Marks
I	Linear programming problem-Basic feasible solutions- Degeneracy dual Linear programming problems. Optimality conditions-The Simplex Method. Artificial Variables- Charnes'M method-Two phase Method.	7	**15%**
II	Dual of Linear programming problems- Duality principle, The Primal-Duality solutions using Simplex Method. Revised Simplex method	7	15%

FIRST INTERNAL EXAMINATION			
III	Transportation problem - Formulation - Existence of solutions of Transportation problems - Solutions of Transportation problem - finding an initial basic solution - North west corner method - Least cost Method - Vogel's Approximation Method - Test for optimality - Modi. Method - Unbalanced transportation problem in Transportation Problems – Transhipment model – Problem with sources and destination acting as transient nodes.	7	15%
IV	Assignment Problem-Formation-Optimal Solution-Hungarian Assignment Method-Travelling salesman problem-sequencing problem-Basic terms used in sequencing-Processing n Jobs through Two Machines-Processing n Jobs through k machines-Processing 2 Jobs through k Machines.	7	15%
SECOND INTERNAL EXAMINATION			
V	Project management: Guidelines for network construction, Critical path method (CPM), Project evaluation and review technique (PERT), Network Techniques: Shortest path problem, Dijkstras Algorithm, Maximum flow problem, Minimum spanning tree problem, Prim algorithm.	7	20%
VI	The Recursive Equation approach- Characteristics of Dynamic programming-Dynamic programming Algorithm-Solution of Discrete D.P.P-Some applications-Solution of L.P.P by Dynamic Programming	7	20%
END SEMESTER EXAMINATION			

QUESTION PAPER PATTERN
(End Semester Examination)

Time: 3 hours **Maximum marks: 100**

The question paper shall consist of Part A, Part B and Part C.

Part A shall consist of three questions of 15 marks each uniformly covering Modules I and II. The student has to answer any two questions (15×2=30 marks).

Part B shall consist of three questions of 15 marks each uniformly covering Modules III and IV. The student has to answer any two questions (15×2=30 marks).

Part C shall consist of three questions of 20 marks each uniformly covering Modules V and VI. The student has to answer any two questions (20×2=40 marks)