

Devi Ahilya University, Indore, India Institute of Engineering & Technology				MSc – I Year (Applied Mathematics) with Specialization in Computing & Informatics Semester- II			
Subject Code & Name	Instructions Hours per Week			Credits			
AM2EM1: Operations Research-I	L	T	P	L	T	P	Total
	3	1	-	3	1	-	4
Duration of Theory Paper: 3 Hours							

Objectives: The course aims at making the students aware of the various techniques, which provides an analytical and objective basis for decisions. These techniques use scientific methods to problems arising from operations involving integrated men, machine and materials and provide a mathematical model to represent complex functional relationships.

Prerequisite(s): Basic knowledge of differentiation & integration of functions, vector algebra, determinants & matrices and calculus of finite difference.

COURSE OF CONTENTS

UNIT I

Introduction to Operations Research, Linear Programming: Principles of Simplex Method, Simplex Method in Tabular Form, Big-M method, Two phase method, Duality and Dual Simplex Method, Degeneracy and Cycling.

UNIT II

Assignment models: Definition, Mathematical Representation, Formulation and Solution, Alternate optimal solution. Transportation Problems: Definition, Formulation and solution, Alternate optimal solution. Travelling salesman problem

UNIT III

Queuing Theory: Objectives and Different Characteristics of a Queuing System, classification of Queuing models, probability distribution of arrival and service times, Models (M/M/1, M/M/C, M/E_K/1, M/D/1, D/D/1).

UNIT IV

Inventory management system, EOQ model with shortage, without shortage and with constraints.

UNIT V

Sequencing Models: Processing n jobs through two machines, m machines, and processing two jobs through m machines.

Simulation: Building a simulation model, Monte-Carlo simulation and applications.

BOOKS RECOMMENDED:

1. Hillier, F. S. and Lieberman, G. J. – Introduction to Operation Research, 8th Ed., New York, McGraw- Hill, 2005.
2. Taha, H. A. – Operations Research: An Introduction, 7th ed., Macmillan Publication Co., 2003.
3. Sharma, S.D. – Operations Research, Kedarnath Ramnath & Co., Meerut, 2004.
4. Dantzig G., Thapa M. Linear programming 1: Introduction, Springer, 1997.
5. P K Gupta & D S Hira, Operations Research, S. Chand., 2008.
6. J.K. Sharma, Operations Research: Theory and Application, 3rd Ed., Macmillan, 2006.