Devi Ahilya University, Indore, India Institute of Engineering & Technology				I Year M.E.(Industrial Engineering and Management) Full Time			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
IMR1C2 QUANTITATIVE TECHNIQUES FOR MANAGEMENT	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
	3	**1**	**1**	**3**	**1**	**1**	**5**
Duration of Theory Paper: 3 Hours							

Objectives & Pre requisites: To develop the skills of decision making in dynamic business situations through quantitative analysis using different mathematical models like linear programming, Transportation, Assignment, Queuing etc. Strategies formulation with the help of game theory and simulation etc.

COURSE CONTENTS

UNIT-1

Introduction:

History and development of O.R Present Trend.

Linear Programming:

Formulation, graphical methods, simplex method, Big- M- method, two phase method, degeneracy unrestricted variables. Quality in L p. revised simplex, duality, sensitivity analysis.

UNIT-2

I Assignment Models: Formulation, Balanced and Unbalanced problems.

II Transportation: Formulation, graphical methods

III Introduction to Integer Programming.

UNIT-3

Waiting Line Models:

Introduction, classification, state in queue, probability distribution of arrival and service times. Single server model (M/M/I). Multiple server model (MMS). Birth & death process.

UNIT-4

Game Theory & Simulation:

Rectangular, two persons, zero sum games, maximin and minimax Principles. Saddle point. Dominic. graphical and algebraic method of solution by transforming into linear programming problem. Bidding problem. Building a simulation model, Monte-Carlo simulation and application.

UNIT-5

Dynamic Programming: Introduction, developing optimal decision policy.

Replacement and Maintenance Models: Introduction, Individual replacement and group replacement policy.

BOOKS RECOMMENDED:

[1]. Taha, *Operations Research*, Tata Mc.Graw Hill.
[2]. Wagner, *Operations Research*, PHI. New Delhi, 2003
[3]. Ravindram & Philips, *Operations Research*, Tata Mc.Graw Hill.
[4]. Gupta & Hira, *Operations Research*, S. Chand. 1e, 2008
[5]. Chitle & Negi, *Operations Research*, Jain Brothers.
[6]. Vohra N.D, Kataria S.K, *Quantitative Techniques for Management*. Tata Mc.Graw Hill, 2004.

LABORATORY EXPERIMENTS:

1. Development, Formulation and Analysis of Linear Programming Problem for given decision making situations.
2. Development and Analysis of Transportation and Assignment models.
3. Development, Formulation and Analysis of Inventory problem for a given system.
4. Study and modeling of Queuing situations at a given service problems.
5. Simulations exercise relating various operations research problems.
6. Development & solution of dynamic programming models.
7. Formulation and solution of various replacement models.
8. Case studies based on Operations Research Problems.