

SMEA4001	RESOURCE MANAGEMENT TECHNIQUES	L	T	P	Credits	Total Marks
		3	0	0	3	100

**COURSE OBJECTIVES**

- To Understand importance of optimization of industrial process management
- To solve problems in linear programming and Integer programming
- To develop in a student efficient and effective deployment of an organization's resources when they are needed
- To analyze and appreciate variety of performance measures for various optimization problems

**UNIT 1 INTRODUCTION AND LINEAR PROGRAMMING****9 Hrs.**

Operations Research(OR)- Nature – Characteristics – Phases - Role of OR in Decision making - Outline of OR Models  
Linear Programming – Formulation of L.P.problems –Solution by graphical method, simplex method, Big M methods.

**UNIT 2 TRANSPORTATION AND ASSIGNMENT MODEL****9 Hrs.**

Transportation problem – Initial Basic feasible solution- Northwest corner method, Least Cost method, Vogel's approximation method – Test for optimality-MODI method. Assignment problems- Hungarian assignment models-Travelling salesman problems

**UNIT 3 RESOURCE SCHEDULING AND NETWORK ANALYSIS****9 Hrs.**

Problem of Sequencing – Problem with N jobs and 2 machines N Jobs 3 machines N Jobs and m machines and 2 Jobs m machines (Graphical method). Project Management -Basic concepts–Network construction and scheduling Critical Path Method (CPM) & Program evaluation review technique (PERT) and resource leveling by network techniques, time – Cost trade off.

**UNIT 4 INVENTORY CONTROL****9 Hrs.**

Inventory Control – Various Types of inventory models – deterministic inventory models – Production model, Purchase model– with and without shortage- Economic Order Quantity (EOQ) – Buffer stock – Shortage quantity, Probabilistic inventory models – Quantity Discount and Price Breaks

**UNIT 5 QUEUEING THEORY AND REPLACEMENT MODELS****9 Hrs.**

Queueing theory – Poisson arrivals and exponential service times, Single channel models only, Replacement policy for items whose maintenance cost increases with time- Consideration of time value of money - Replacement policy- Individual, Group replacement of items that fail completely and suddenly.

**Max. 45 Hrs.****COURSE OUTCOMES**

On completion of the course, student will be able to

- CO1 - Formulate the linear programming problems.
- CO2 - Analyse transportation and assignment problems.
- CO3 - Develop the scheduling systems.
- CO4 - Analyse CPM and PERT methods.
- CO5 - Describe the different inventory models.
- CO6 - Design the Queueing theory and examine the replacement model.

**TEXT/REFERENCE BOOKS**

- 1 K. Malik, S. K. Yadav, S. R. Yadav, Optimization Techniques. I K International Publishing House Pvt. Ltd; First Edition edition, 2013.
- 2 PK Gupta, D.S Hira Operations Research. S Chand seventh revised edition, 2014.
- 3 Sharma S.D, Operation research Theory,Methods and Application, 17th Edn., Kedar Nath Ram Nath Publication, 2010.
- 4 Nita H Shah, Ravi M Gor & Hardik Soni, Operation research, 4th Edn., PHI, 2010.
- 5 Edwin K. P. Chong & Stanislaw H. Zak, "An Introduction to Optimization" Wiley India, 2017.
- 6 Mohan, Kusum Deep, Optimization Techniques. New Age Science, 2009.

**END SEMESTER EXAMINATION QUESTION PAPER PATTERN****Max. Marks: 100****Exam Duration: 3 Hrs.****PART A:** 10 Questions of 2 marks each – No choice**20 Marks****PART B:** 2 Questions from each unit of internal choice, each carrying 16 marks**80 Marks**