

**E.M.G.YADAVA WOMEN'S COLLEGE, MADURAI-14****(An Autonomous Institution – Affiliated to Madurai Kamaraj University)****Re-accredited (3<sup>rd</sup> Cycle) with Grade A<sup>+</sup> and CGPA 3.51 by NAAC****CBCS with OBE****DEPARTMENT OF MATHEMATICS– UG****CERTIFICATE COURSE****(w.e.f 2022 – 2023 Batch Onwards)****COURSE STRUCTURE****Contact Hours : 90 Hrs****Credits : 2**

<b>S.No.</b>	<b>Semester</b>	<b>Subject code</b>	<b>Title of the Paper</b>
1	I & II	<b>22MAC</b>	Certificate Course in Operations Research
2	I & II	<b>22MACP</b>	Practical I

Department of Mathematics			Class : I B.Sc.		
Sem.	Category	Course Code	Course Title	Credits	Contact Hours
I & II	Certificate Course	22MAC	Certificate Course in Operations Research	2	90
		22MACP	Practical I		

### Course Objectives

1. To Understand and develop the manipulations skill in hyper plane and convex set.
2. To acquire the knowledge about the nature and features of OR.
3. To learn the mathematical formulations problems.
4. To construct the Graphical solution method in LPP.
5. To Study the techniques of Operations Research and Linear Programming.

### Course Content:

#### Unit:I

Vectors-Vector Inequalities-Linear Combination of Vectors- Hyperplanes and hyperspheres-Convex Sets and their Properties-Supporting and Separating Hyper planes-Convex Functions-Local and Global Extreme.

#### Unit:II

Origin and Development of Operation Research (O.R) - Nature and features of O.R.-Scientific method in O.R.- Modelling in O.R

#### Unit:III

Linear Programming Problem-Mathematical formulation of the Problem-Illustration on Mathematical Formulation of LPPs

#### Unit:IV

Graphical Solution Method-General Linear Programming Problem-Canonical and Standard Forms of LPP

#### Unit:V

Mathematical formulation of the Assignment problem-Solution Methods of Assignment Problem - The Travelling Salesman Problem

**Books for study:**

KantiSwarup,P.K.Gupta,ManMohan, .(2011) “*Operations Research*” Sultan Chand&Sons,EducationalPublishers,New Delhi

Unit I : Chapter 0 :Sections : 0.9 to 0.16

Unit II : Chapter 1 :Sections: 1.2 to 1.5

Unit III: Chapter 2 : Section 2.2 to 2.4

Unit IV : Chapter 3 : Sections 3.2 , 3.4 & 3.5

Unit V : Chapter 11 : Sections 11.2,11.3 & 11.7

**Books for Reference:**

1. Arumugam S. and Thagapandi Isaac A., (2012). “*Topics in OperationsResearch*”Linear programming,June NewGamma Publishing House, Palayamkottai
2. Gupta P.K.,ManMohan, .,(2010). “*Problems in Operations Research* “ Sultan Chand & Sons, Delhi, Sharma J.K.,4 th Edition. “*Operations Research Theory and Applications*”Macmillan Publishers India Ltd

**List of Problems:**

1. Problems in Linear Combination of vectors
2. Problems in Convex Sets
3. Problems in Hyperplanes
4. Mathematical Formulation of LPP-Production Allocation Problem.
5. Mathematical Formulation of LPP-Diet Problem.
6. Graphical Method-Optimal Solution(Bounded)
7. Graphical Method-Optimal Solution(Unbounded)
8. Problems in Canonical form
9. Problem in Standard form
10. Balanced Assignment Problem
11. Unbalanced Assignment Problem
12. Travelling Salesman Problem