

Branch Name:	B.Sc. Mathematics
Program Code:	SC104
Course Name:	Operations Research - I
Course Code:	2SC1040504
Pre-requisite Course:	

Course Objectives:

1. To understand the concept of Linear Programming Problem.
2. To know about slack and surplus variable.
3. To understand Graphical Method, Simplex Method and Two-Phase Method.
4. To understand the concept of Index Number.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	--	--	3	70	30	--	--	100

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	Introduction: Nature and scope of Operations Research. Linear programming: (a) LP Model and method of solution- Graphical method, Slack-Surplus and unrestricted variables, Simplex Algorithm, Simplex Method.	15	33
2	Artificial Slack variables, Two phase method, Big-M / Penalty method, Variation in simplex method solution- unbounded, infeasible solutions and concept of degeneracy.	15	33
3	Index Number: Meaning, Definition, Characteristics, Uses and Limitations of Index Number, Method of constructing price and quantity indices- Laspeyre's, Paache's, Fisher's, Dorbish-Bowley's and Marshal-Edgeworth's Index numbers, Cost of Living Index Number of Consumer price index number, Test of adequacy-Time and factor reversal tests, Chain-base index numbers, Base shifting splicing.	18	34

Reference Books:

1. Operations Research, by. J.K.Sharma. Macmillan Publishers India Ltd.
2. Operations Research by Nita Shah, Ravi Gor and Hardik Soni, Prentice Hall of India.
3. Operations Research (Principles and Practice) by Pradeep Prabhakar Pai, Oxford University Press.
4. Business Statistics-1, Sudhir Prakashan, Ahmedabad.

1. <https://www.youtube.com/watch?v=01Iy2ZHOmNg>
2. <https://www.youtube.com/watch?v=61lkRMXne2U>
3. <https://www.youtube.com/watch?v=dUe3U0BTb4k>

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Describe nature and scope of Operation Research.	1 Remembering
CLO2	Discuss Graphical method for solving LPP.	2 Understanding, 3 Applying
CLO3	Solve LPP using simplex method.	3 Applying
CLO4	Explain Big-M method and using it solve the LPP.	4 Analysing, 3 Applying
CLO5	Know the Index number to Justify Laspeyre's and Paasche's Index number.	5 Evaluating
CLO6	Create an example of LPP from given data of any company.	6 creating

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1		M	M						M	H			H	L	L	L
CLO2		L	M		L				M	H			L	L		L
CLO3	M	L	L	L					M	L		L	L	M		L
CLO4	M		L	L					M	L		L	L	M		L
CLO5	L			L						L			L			
CLO6		L	H		L				M				L	L		

H: High, M: Medium, L: Low