

# ST. ALOYSIUS COLLEGE(AUTONOMOUS), JABALPUR

Reaccredited 'A+' Grade by NAAC(CGPA:3.68/4.00)

College with Potential for Excellence by UGC

DST-FIST Supported & STAR College Scheme by DBT

## Faculty of Science

Bachelor of Science (B.Sc.)

**SUBJECT: MATHEMATICS**

B.Sc. VI Semester

Paper-Core – Operations Research

### Course Outcomes

CO. No.	Course Outcomes	Cognitive Level
CO1	Comprehend Operations Research: Origin and Scope	U
CO2	Apply Linear Programming Problems to Real World. Analyse and Evaluate an Optimal Solution by Graphical and Simplex method.	Ap, An E
CO3	Design, Analyse and Solve Transportation Problems	Ap, An. E
CO4	Formulate, solve and apply assignment problems so that cost is minimized.	Ap, An E
CO5	Frame and evaluate job sequencing problems	Ap, An E

### Credit and Marking Scheme

Theory	Credits	Marks		Total Marks
		Internal	External	
	6	40	60	100
<b>Total</b>	<b>6</b>	<b>100</b>		

### Evaluation Scheme

Theory	Marks	
	Internal	External
	3 Internal Exams of 20 Marks each during the Semester (Best 2 will be taken)	1 External Exams (At the End of Semester)

Wandey  
26/7/24

Thimm

Arbans

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W. Chandras  
26/7/24

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## Content of the Course Theory

No. of Lectures Hours per Week: 6 Hours. per Week

Total No. of Lectures: 90 Hours.

Maximum Marks: 60

Unit	Topics	No. of Lectures
I	<b>1. Operations Research</b> 1.1 Origin 1.2 Scope 1.3 Linear Programming Problem (LPP) 1.4 Real Life Applications 1.5 Solution of Properly Behaved LPP by Graphical Method 1.6 Solution of Exceptional Case LPP 1.7 Solution of LPP by Simplex Method	36
II	<b>2. Transportation Problem</b> 2.1 Initial Basic Feasible Solution 2.2 North-West Corner Rule 2.3 Row Minima Method 2.4 Column Minima Method 2.5 Matrix Minima Method 2.6 Vogel's Approximation Method 2.7 Optimality Test by MODI Method. 2.8 Unbalanced Transportation Problem	30

R. M. S.

Handus  
26/7/24

Arslang

Sjan

M. D. S.  
26/7/24

Devati

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III	<b>3. Assignment Problem:</b> 3.1 Mathematical Formulation 3.2 Hungarian Method 3.3 Rules to Draw Minimum Number of Lines 3.4 Unbalanced Assignment Problem 3.5 Maximal Assignment Problem 3.6 Traveling Salesman Problem	28
IV	<b>4. Sequencing</b> 4.1 Johnson's Algorithm 4.2 Idle Time 4.3 Elapsed Time 4.4 n Jobs on Two Machines 4.5 n Jobs on Three Machines 4.6 n Jobs on m Machines 4.7 Two Jobs through m Machines	26

## References

### Text Books:

1. S. D. Sharma; Operations Research.

### Reference Books:

1. K. Swarup; P.K. Gupta and Manmohan, Operations Research, Sultan Chand & Sons, New Delhi.
2. H. A. Taha; Operations Research- An introduction, Macmillan Publishing Co. Inc. New York.
3. P. K. Gupta and D. S. Hira; Operations Research, an Introduction, S. Chand & Company Ltd. New Delhi.
4. H. Hadley; Linear and Dynamic programming, Addison-Wesley Reading Mass.
5. F.S. Hiller and G.J. Lieberman; Industrial Engineering Series, 1995.

Mandru  
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Ardang  
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Ramesh  
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Preeti  
A. Y.