

Resolution No.: BOS/100623/AC/260623

Bharatiya Vidya Bhavan's

**M. M. College of Arts, N.M. Institute of Science, H.R.J.
College of Commerce**

(Bhavan's College) Autonomous

(Affiliated to University of Mumbai)



Syllabus for: T. Y. B. Com.

OPERATIONS RESEARCH

Program: B.Com.

Program Code: BH. BCom.

Course Code: (BH. BCOMTS.9)

with effect from academic year 2023-24

Programme: B.Com.				Semester: V	
Course: OPERATIONS RESEARCH I				Course Code:- BH.BCOMTSV.9	
Teaching Scheme				Evaluation Scheme (Theory)	
Lecture (Periods per week)	Practical (Periods per week per batch)	Tutorial (Periods per week per batch)	Credits (Theory)	Continuous Internal Assessment (CIA)	End Semester Examination (ESE)
3	-	--	3	(Marks - 40)	(Marks: 60)
Pre-requisites: Use of Normal Distribution in finding Probabilities. Concept of present value of money. Application of derivatives to obtain minima of Cost functions					
Course Objectives:					
<ol style="list-style-type: none"> 1. To understand need of Operations Research for effective decision using quantitative approach 2. To understand use of models of operations research by solving problem under consideration 3. To gain knowledge of concepts like LPP, Replacement theory, Transportation problem 					
Course Outcomes: After completion of the course, students would be able to					
<ol style="list-style-type: none"> 1. To Understand concept and practical implementation of Operations Research 2. Illustrate knowledge of LPP, Replacement Theory 3. To practical implementation of Transportation and assignment problem 					
Detailed Syllabus: (per session plan)					
Unit	Description				Periods
I	Introduction: Meaning and scope of Operations Research, Applications in Business, Commerce and Industry, limitations of Operations Research. Replacement Theory: Replacement Models for items that deteriorate with time assuming value money i) constant ii) changes with time. Replacement of items that fail completely using individual and Group replacement.				15
II	Linear Programming Problems (LPP) : Mathematical Formulation of LPP . Solution to the LPP using Graphical Method, Simplex Method and Big M method Duality in LPP. Detection of optimum solution to primal using optimum solution to the dual.				15

III	Transportation Problem: Description and Formulation of Transportation Problem Initial Basic Feasible Solution by i) North West Corner Rule, ii) Least Cost Entry Method (Matrix Minima), iii) Vogel's Approximation Method. Optimum Solution by MODI Method. Existence of Alternative optimum solution. Impact of change in some cost Coefficients on optimum solution. Maximization type and Unbalanced Transportation Problems. Assignment Problem Meaning of Balanced Assignment Problem (AP). Its mathematical form, Hungarian Method A.P. for minimization and maximization problem	15
	Total	45

Reference Books:

1. Operations Research Principles & Practice by Ravinderan, Phillips Solber.
2. Schaum's outline series Theory & Problems of Operations Research by Richard Bronson
3. Operations Research by H.A.Taha
4. Operations Research by Gupta & Hira
5. Operations Research Theory & Applications by J.K.Sharma
6. Operations Research Problems & Solutions by V.K.Kapoor
7. Quantitative Techniques by Shenoy, Shrivastav & Sharma
8. Introduction to Operations Research by Hiller & Lieberman
9. Operations Research Techniques for Management by B.Banerjee
10. Operations Research by Gupta & Manmohan
11. Quantitative Techniques by N.D.Vohra

Details of Continuous Internal Assessment (CIA)

For continuous internal assessment, it is proposed to hold one class test (for 20 marks) and one assignment /project/survey conduction & data presentation using data visualization techniques, learnt in a course to be given (for 20 marks) on topics which they may explore on their own (under due guidance by teacher).

Programme: B.Com.				Semester: VI	
Course: OPERATIONS RESEARCH II				Course Code:- BH.BCOMTSVI.9	
Teaching Scheme			Evaluation Scheme (Theory)		
Lecture (Periods per week)	Practical (Periods per week per batch)	Tutorial (Periods per week per batch)	Credits (Theory)	Continuous Internal Assessment (CIA)	End Semester Examination (ESE)
3	-	--	3	(Marks - 40)	(Marks: 60)
Pre-requisites: Use of Normal Distribution in finding Probabilities. Concept of present value of money. Application of derivatives to obtain minima of Cost functions					
Course Objectives:					
1.To understand use of models of operations research by solving problem under consideration					
2.To gain knowledge of operation research models like Project analysis, Game theory and inventory models.					

Course Outcomes: After completion of the course, students would be able		
1.Draw their own network diagram,		
2.Apply game theory concepts to the real-life problem		
3. To illustrate knowledge of Inventory Models.		
Detailed Syllabus: (per session plan)		
Unit	Description	Periods

I	Project Analysis: Basic concepts and Definitions, Gantt Charts and its weaknesses, CPM and PERT networks, Numbering of Events, Contractual Obligation Time, Earliest occurrence time, Latest allowable occurrence. Time and Slack Time for Events, Different types of floats for activities. Critical Path Calculations, Probability Assessment in PERT Networks. Time Cost Trade – Off Analysis for CPM Networks.	15
II	Theory of Games: Basic Concept and Definitions. Two Person Zero Sum Game. Saddle point, Pure and Mixed Strategies. Reducing the size of the game using dominance property. Optimum Solution to a 2x2 game without saddle point. Graphical solution to 2xn and mx2 games.	15
III	Inventory Models: Costs in Inventory Management Deterministic Inventory Models- EOQ Model with Instantaneous Replenishment and Constant Rate of Demand Assuming that shortages are not allowed (Mathematical derivation expected), its price break model. Other EOQ models with instantaneous/uniform rate of replenishment and constant rate of demand assuming shortages are allowed/not allowed.	15
	Total	45

Reference Books:

1. PERT & CPM Principles and Applications by L.S.Srinath
2. Operations Research Principles & Practice by Ravinderan, Phillips Solber.
3. Schaum's outline series Theory & Problems of Operations Research by Richard Bronson
4. Operations Research by H.A.Taha
5. Operations Research by Gupta & Hira
6. Operations Research Theory & Applications by J.K.Sharma
7. Operations Research Problems & Solutions by V.K.Kapoor
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