

OPERATIONS RESEARCH

Course Code	Category	Hours / Week			Credits	Maximum Marks																																															
		L	T	P		CIA	SEE	Total																																													
BCSB27	Open Elective	3	-	-	3	30	70	100																																													
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45																																																
<p>I. COURSE OVERVIEW: The course allow students to possess a solid understanding of optimization techniques and their applications. They are equipped with the skills to formulate and solve optimization problems, analyze and interpret results, and make optimal decisions in various domains such as operations management, logistics, finance, and engineering.</p> <p>II. COURES OBJECTIVES: The students will try to learn: I. Apply the dynamic programming to solve problems of discreet and continuous variables. II. Understand the concept of nonlinear programming. III. Describe the sensitivity analysis.</p> <p>III. COURSE OUTCOMES: After successful completion of the course, students should be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">CO1</td> <td style="width: 70%;">Recall the basics of operation research</td> <td style="width: 20%;">Understand</td> </tr> <tr> <td>CO2</td> <td>Explain the characteristics and scope of OR</td> <td>Understand</td> </tr> <tr> <td>CO3</td> <td>Outline and formulate mathematical problems</td> <td>Understand</td> </tr> <tr> <td>CO4</td> <td>Select optimal problems solving techniques for a given problem using LP</td> <td>Apply</td> </tr> <tr> <td>CO5</td> <td>Solve transportation, travelling sales man and Assignment problems</td> <td>Apply</td> </tr> </table> <p>IV. COURSE OUTCOMES:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">UNIT-I</td> <td style="width: 60%;">INTRODUCTION</td> <td style="width: 25%;">Classes: 09</td> </tr> <tr> <td colspan="3">Optimization Techniques, Model Formulation, models, General L.R Formulation, Simplex Techniques, Sensitivity Analysis, Inventory Control Models</td> </tr> <tr> <td>UNIT-II</td> <td>FORMULATION TECHNIQUES</td> <td>Classes: 09</td> </tr> <tr> <td colspan="3">Formulation of a LPP - Graphical solution revised simplex method - duality theory - dual simplex method - sensitivity analysis - parametric programming.</td> </tr> <tr> <td>UNIT-III</td> <td>NON LINEAR METHODS</td> <td>Classes: 09</td> </tr> <tr> <td colspan="3">Nonlinear programming problem - Kuhn-Tucker conditions min cost flow problem. max flow problem - CPM/PERT.</td> </tr> <tr> <td>UNIT-IV</td> <td>SCHEDULING MODELS</td> <td>Classes: 09</td> </tr> <tr> <td colspan="3">Scheduling and sequencing - single server and multiple server models - deterministic inventory models - Probabilistic inventory control models - Geometric Programming.</td> </tr> <tr> <td>UNIT-V</td> <td>DYNAMIC PROGRAMMING AND GAME THEORY</td> <td>Classes: 09</td> </tr> <tr> <td colspan="3">Competitive Models, Single and Multi-channel Problems, Sequencing Models, Dynamic Programming, Flow in Networks, Elementary Graph Theory, Game Theory Simulation</td> </tr> </table>									CO1	Recall the basics of operation research	Understand	CO2	Explain the characteristics and scope of OR	Understand	CO3	Outline and formulate mathematical problems	Understand	CO4	Select optimal problems solving techniques for a given problem using LP	Apply	CO5	Solve transportation, travelling sales man and Assignment problems	Apply	UNIT-I	INTRODUCTION	Classes: 09	Optimization Techniques, Model Formulation, models, General L.R Formulation, Simplex Techniques, Sensitivity Analysis, Inventory Control Models			UNIT-II	FORMULATION TECHNIQUES	Classes: 09	Formulation of a LPP - Graphical solution revised simplex method - duality theory - dual simplex method - sensitivity analysis - parametric programming.			UNIT-III	NON LINEAR METHODS	Classes: 09	Nonlinear programming problem - Kuhn-Tucker conditions min cost flow problem. max flow problem - CPM/PERT.			UNIT-IV	SCHEDULING MODELS	Classes: 09	Scheduling and sequencing - single server and multiple server models - deterministic inventory models - Probabilistic inventory control models - Geometric Programming.			UNIT-V	DYNAMIC PROGRAMMING AND GAME THEORY	Classes: 09	Competitive Models, Single and Multi-channel Problems, Sequencing Models, Dynamic Programming, Flow in Networks, Elementary Graph Theory, Game Theory Simulation		
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Text Books

1. H.A. Taha, "Operations Research - An Introduction", PHI, 2008
2. H.M. Wagner, "Principles of Operations Research", PHI, Delhi, 1982.
3. J.C. Pant, "Introduction to Optimisation: Operations Research", Jain Brothers, Delhi, 2008

Reference Books

1. Hitler Libermann, "Operations Research" McGraw Hill Publications, 2009.
2. Pannerselvam, "Operations Research" Prentice Hall of India, 2010.
3. Harvey M Wagner, "Principles of Operations Research" Prentice Hall of India, 2010.

Web References

1. https://onlinecourses.nptel.ac.in/noc17_mg10/preview

E-Text Books

1. <http://nptel.ac.in/courses/112106134/>