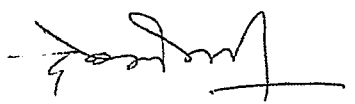
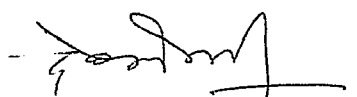


Part A Introduction			
Program: Diploma		Class: BCA	Year: II Year
Session: 2022-2023			
Subject: Computer Applications			
1	Course Code	S2-BCAC2G	
2	Course Title	Optimization Techniques	
3	Course Type	Generic Elective	
4	Pre-requisite (if any)	To study this course, a student must have had Certificate Course.	
5	Course Learning Outcomes (CLO)	The course will enable the students to: 1. Formulate real life problems into linear programming problem. 2. Apply the simplex method to find an optimal vector for the standard linear programming problem and the corresponding dual problem. 3. Find optimal solution of transportation. 4. Formulate and solve linear programming model of two person zero sum game. 5. Solve nonlinear programming problems using Kuhn-Tucker conditions.	
6	Credit Value	06Credits	
7	Total Marks	Max. Marks: 30 + 70 = 100	Min. Passing Marks: 33

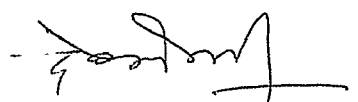

 Dr. Goswami

Part B - Content of the Course		
Total No. of Lectures (in hours per week):3 hours per week		
Total Lectures:90 hours		
Unit	Topics	No. of Lectures
I	Linear Programming Problem: 1.1 Basic concepts of linear programming problem 1.2 Simplex method and algorithm 1.3 Artificial variables technique 1.4 Two-phase method 1.5 Big-M method	15
II	Duality: 2.1 Definition and formulation of the dual problem 2.2 Primal-dual relationships 2.3 Economic interpretation of the dual 2.4 Dual simplex Method 2.5 Sensitivity analysis	15
III	Transportation Problems: 3.1 Mathematical model 3.2 Balanced and unbalanced problems 3.3 Degeneracy 3.4 Optimality conditions 3.5 Methods to find starting solution and optimal solution 3.6 Algorithm for solving transportation problem 3.7 Northwest-Corner method 3.8 Least cost method 3.9 Vogel approximation method for determination of starting basic solution	20
IV	Network Analysis: 4.1 Constraints in network 4.2 Construction of network 4.3 Critical Path Method (CPM) 4.4 PERT calculation 4.5 Resource leveling by network techniques 4.6 Advances of network (PERT/CPM)	20
V	Game Theory: 5.1 Formulation of two person zero sum games 5.2 Solving two person zero sum games 5.3 Games with mixed strategies 5.4 Graphical solution procedure 5.5 Linear programming solution of games 5.6 Non-Linear programming techniques 5.6.1 Kuhn-Tucker conditions 5.6.2 Non-negative constraints	20
Keywords/Tags: Linear Programming Problem, Duality, Transportation Problems, Network Analysis, Game Theory.		


 Dr. G. S. Goswami

Part C - Learning Resources	
Text Books, Reference Books, Other Resources	
Suggested Readings:	
Text Books:	
1. KantiSwarup, P.K. Gupta and Manmohan: Opertions Research, Sultan Chand and Sons, New Delhi, 2014.	
2. Guillermo Owen: Game Theory, Emerald Publishing Limited, 4 th edition, 2013.	
3. S. D. Sharma: Operations Research, KedarNath Publication, 2012.	
4. Nita H. Shah, Ravi M. Gor and HardikSoni: Operations Research, PHI Learning Pvt. Ltd., 2007.	
5. Book published by M.P. Granth Academy , Bhopal	
Reference Books:	
1. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali:Linear Programming and Network Flows, 2 nd Ed., John Wiley and Sons, India, 2004.	
2. F.S. Hillier and G.J. Lieberman:Introduction to Operations Research, 9 th Ed., Tata McGraw Hill, Singapore, 2009.	
3. Hamdy A. Taha:Operations Research, An Introduction, 8 th Ed., Prentice-Hall India, 2006.	
4.Prem Kumar Gupta and D.S.Hira: Operations Research-An Introduction, S.Chand & SonsCompany Ltd.,New Delhi, 1995.	
Suggested Digital Platforms Web links:	
https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=25	
https://www.highereducation.mp.gov.in/?page=xhziQmpZwkylQo2b%2Fy5G7w%3D%3D	
Suggested Equivalent online courses:	
https://nptel.ac.in/courses/110106062/	
https://nptel.ac.in/courses/111107128/	
https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/275	
http://www.mphindigranthacademy.org/	

Part D-Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks : 100		
Continuous Comprehensive Evaluation (CCE) : 30marks University Exam (UE) 70marks		
Internal Assessment :	Class Test	Total 30
Continuous Comprehensive Evaluation (CCE):30	Assignment/Presentation	
External Assessment :	Section(A) : Objective Questions	Total 70
University Exam Section: 70	Section (B) : Short Questions	
Time : 03.00 Hours	Section (C) : Long Questions	


Dr. G. S. Gaur