LSCM 2007	Decision Modeling using spreadsheet	L	T	P	C
Version 1.0		3	0	0	3
Pre-requisites/Exposure	Basic Principles of Management, Basics Business Mathematics, Computer Applications.				
Co-requisites					

Course Objectives

Managers usually find spreadsheets natural, intuitive and user-friendly platforms for organizing information and performing "what if" analyses. Spreadsheets have therefore become indispensable tools of modern business analysis. This course will focus on structuring, analyzing, and solving managerial decision problems on Excel spreadsheets. We will address problems of resource allocation (how to utilize available resources optimally), risk analysis (how to incorporate uncertainty in problem parameters), decision analysis (how to synthesize a sequence of decisions involving uncertainty), data analysis (how to summarize available data into useful information), and forecasting (how to extrapolate past data into the future). In each area, we will consider specific managerial decision problems, model them on Excel spreadsheets, analyze and solve the models using available Excel commands, functions, tools, and add-ins, and study economic interpretations of the solutions obtained

Course Outcomes

On completion of this course, the students will be able to

CO1: Linear programming solution by solver

CO2: Transportation problem by spread sheet

CO3: Decision modeling. Allocation of resources using spreadsheet

CO4: Inventory analysis using spreadsheet

Catalog Description

Decision Modeling using spreadsheet explores the opportunities to analyze and decide improvements in logistics, supply chain and operations management. The main focus lies on production and service processes, allocating resources to capacity and facility planning to achieve the organization's long-range objectives by setting operational goals. Care will be taken to strike a balance between theoretical and practical perspectives in manufacturing and service organizations. Various modeling techniques to optimize the flow of goods,

manpower, resources and money have are analyzed in the course and decisions are taken based on both qualitative as well as quantitative methods. Excel is used to understand the interpretations of the solutions and to perform what-if analysis.

Course Content

Unit I: 6 lecture hours

Introduction to spread sheet, Introduction to graphs, Introduction to various probability distribution functions

Unit II: 6 lecture hours

Introduction to linear programming, Profit maximization, Solution to linear Programming, Introduction to transportation problems, Solution of transportation problem

Unit III: 6 lecture hours

Introduction to inventory, safety stock and lead time, Modeling of inventory, Analysis of inventory by spreadsheets, Introduction to type of decision making, Decision making under Risk

Unit IV: 6 lecture hours

Introduction to financial Parameters, Financial calculations using Microsoft Excel, Introduction to Multi –objective Optimization

Unit V: 6 lecture hours

Quality Management, Quality Inspection, Quality Assurance, Quality Control Tools & Techniques

Unit VI: 6 lecture hours

Vehicle Routing Problem, Introduction to AHP, AHP Implementation

Text Books

Text Books

Ramesh Bangia (2013) Learning Microsoft Excel 2010

Reference Books

1. J.K Sharma (2009) Operations Research Theory and Applications 4th edition

Modes of Evaluation: Quiz/Assignment/ presentation/ Test/Written Examination
Examination Scheme:

Components	MSE I	Internal Examination	ESE
Weightage (%)	20	30	50

ASSESSMENT TOOLS:

Description	Weight age
1. Internal Examination	30%
2. Mid-term Exam	20%
3. End term Exam	50%

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	**Mapped Programme Outcomes**
CO1	**Linear programming solution by solver**	**PO 1, 2, 4, 8,9,12**
CO2	**Transportation problem by spread sheet**	**PO 2,3,4,8,7,8**
CO3	**Decision modeling. Allocation of resources using spreadsheet**	**PO 3,4,6,8, 9, 12**
CO4	**Inventory analysis using spreadsheet**	**PO 4,5,6,7,9,10,11**

Program Outcome / Course Outcome mapping

Course Outcomes	CO 1	CO 2	CO 3	CO 4
PO 1	3	3	3	2

PO 2	3	3	3	2
PO 3	3	3	3	2
PO 4	3	1	1	3
PO 5	2	2	1	3
PO 6	2	2	2	2
PO 7	3	3	1	2
PO 8	3	3	3	3
PSO 9	3	3	3	1
PSO 10	3	3	3	2
PSO 11	3	3	3	2
PSO 12	1	1	1	3

		Students will demonstrate strong conceptual knowledge of management & its functional areas.
		Students will demonstrate effective oral and written communication skills in the professional context.
		Students will be able to work effectively in teams and demonstrate team-building capabilities.
		Students will be able to evaluate the legal, social and economic environments of business.
		Students will be able to describe the global environment of business.
		Students will demonstrate sensitivity towards ethical and moral issues and have ability to address them in the course of business.
		Students will be able to apply decision-support tools to business decision making.
		Students will be able to apply knowledge of business concepts and functions in an integrated manner.
		Students will demonstrate conceptual domain knowledge of the logistics sector.
		Students will apply decision-support tools to decision making in logistics sector.
		Students will apply conceptual knowledge of logistics sector in an integrated manner.
		Students will demonstrate employable and deployable skills for appropriate roles in management.

LSCM 2007	Decision Modeling using spreadsheet	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 9	PSO 10	PSO 11	PSO12
		3	3	3	2	2	2	2	3	2	3	3	2

1 – Weakly mapped
2 – Moderately mapped
3 – Strongly mapped

Model Question Paper

Name:

Enrolment No:

Course::LSCM 2006 – Decision Modeling using spreadsheet

Programme: BBA (LM) **Semester:** II EVEN-2017-18

Time: 03 hrs. **Max. Marks:100**

Instructions:

Section A:Multiple Choice Questions (All Questions are compulsory, each carrying 2 marks); **Section B**: short answer type questions (All Questions are compulsory, each carrying 5 marks)**; Section C** Long answer type questions (Attempt any three, each carrying 10 marks)**; Section D** Case analysis (All questions are compulsory, each carrying 10 marks)

	Section – A		
1.	Optimization models have been successfully applied in design analysis (T/F)	**[2]**	**CO3**
2.	Simulation Models describes how manufacturing activities consume scarce resources (T/F)	**[2]**	**CO4**
3.	A simplified representation (T/F)	**[2]**	**CO1**
4.	G.B.Dantzig design the "simplex method" (T/F)	**[2]**	**CO3**
5.	Formulas are entered in the worksheet cell and must begin with equal (T/F)	**[2]**	**CO4**
6.	A _____ is a document that is entirely made up of rows	**[2]**	**CO2**

	and columns.		
7.	_____ models predict demand for the company's finished products, the cost of raw materials or other factors	**[2]**	**CO3**
8.	There is an overabundance of _____ data	**[2]**	**CO4**
9.	There are two basic types of cell references in Excel	**[2]**	**CO3**
10.	Assuming there are no other changes to the input parameters, the change in the objective function value per unit increase to a right hand side of a constraint is called the _____	**[2]**	**CO2**
	SECTION B		
11.	What are the various assumptions of Linear Programming models?	**[5]**	**CO1**
12.	What is a linear programming model? What are its components?	**[5]**	**CO3**
13.	What are the various steps in decision making?	**[5]**	**CO3**
14.	What are the various types of models? Explain.	**[5]**	**CO3**
	SECTION C		
15.	Use graphical model to solve the following LP problem Maximize Z = $2x_1 + 3x_2$ Subject to the constraints i) $x_1 + 3x_2 <= 9$ ii) $3x_1 + x_2 <= 7$ iii) $x_1 - x_2 <= 1$ and $x_1, x_2 >= 0$	**[10]**	**CO4**
16.	Build a mathematical model for the below question Two types of products Labor limit (Labor days availability : 200,000 days/mo) Materials limit (Materials availability: 8,000,000 kg/mo) Marketing lower limits (product 1 = 100, product 2 = 200) Unit profit (product 1 = $8,000, product 2 = $12,000) Unit consumption labor (days/unit (product 1 = 300, product 2 = 500) Unit consumption materials (kg/unit) (product 1 = 10,000, product 2 = 15,000)	**[10]**	**CO3**
	Section D **17.** The ABC company has been a producer of picture tubes for television sets and certain printed circuits for radios. The company		**CO1**

	has just expanded into full scale production and marketing of AM and AM-FM radios. It has built a new plant that can operate 48 hours per week. Production of an AM radio in the new plant will require 2 hours and production of AM-FM radio will require 3 hours. Each AM radio will contribute Rs. 40 to profits while an AM-FM radio will contribute Rs. 80 to profits. The marketing department, after extensive research has determined that a maximum of 15 AM radios and 10 AM-FM radios can be sold each week. a) Formulate a linear programming model to determine the optimum production mix of AM and FM radios that will maximize profits. b) Solve the above problem using the graphical method		

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