



ARSD College, University of Delhi

Model Course Handout/Lesson Plan

Course Name : B.Com.(Hons)						
Semester	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical (P)	Credit (C)
V	BCH 4.2	BUSINESS MATHEMATICS	4	1	1	6
Teacher/Instructor(s)		NEETU YADAV				
Session		2022-23				

Course Objective:

The objective of this course is to make the students learn the basic mathematical tools with special emphasis on applications to business and economic situations.

Course Learning Outcomes:

After completing the course, the student shall be able to:

- Comprehend the concept of systematic processing and interpreting the information in quantitative terms to arrive at an optimum solution to business problems.
- Develop proficiency in using different mathematical tools (matrices, calculus, linear programming, and mathematics of finance) in solving daily life problems.
- Obtain critical thinking and problem-solving aptitude.
- Evaluate the role of mathematics in the business and economy .

Lesson Plan:

Unit No.	Learning Objective	Lecture No.	Topics to be covered
1.	Matrices and Determinants	1	Definition and types of matrix, Algebra of matrices
		2	Inverse of a matrix- Business Applications.
		3-4	Solution of system of linear equations- matrix inversion method
		5-6	Solution of system of linear equations- Cramer's Rule
		7-8	Leontief Input Output Model
2.	Basic Calculus	9-10	Mathematical functions and their types (linear, quadratic, polynomial, exponential, logarithmic and logistic function)
		11	Concepts of limit and continuity of a function.
		12	Concept of Marginal Analysis.
		13	Concept of Elasticity
		14-15	Applied Maxima and Minima problems including effect of Tax on Monopolist's Optimum price and quantity,
		16	Economic Order Quantity
3.	Advanced Calculus	21-22	Partial Differentiation: Partial derivatives up to second order
		23	Homogeneity of functions and Euler's theorem

		24	Total differentials. Differentiation of implicit functions with the help of total differentials
		25-28	Maxima and Minima involving two variables – Applied optimization problems and Constraint optimization problems using La grange multiplier involving two variables having not more than one constraint
		29	Integration: Standard forms & methods of integration- by substitution, by parts and by use of partial fractions.
		27-28	Definite integration. Finding areas in simple cases
		29-30	Application of Integration to marginal analysis;
		31-32	Consumer's and Producer's Surplus
		33	Rate of sales
		34-38	The Learning Curve. Questions for Practice
4.	Mathematics of Finance	39-40	Rates of interest: nominal, effective and their inter-relationships in different compounding situations
		41	Compounding and discounting of a sum using different types of rates.
		42-44	Applications relating to Depreciation of assets and Equation of value.
		45-46	Types of annuities: ordinary, due deferred, continuous, perpetual. Determination of future and present values using different types of rates of interest.
		47-48	Applications relating to Capital expenditure, Leasing, Valuation of simple loans and debentures, sinking fund. Practical Lab
5.	Linear Programming	51-52	Formulation of Linear programming problems (LPPs), Graphical solutions of LPPs. Cases of unique solutions, multiple optional solutions, unbounded solutions, infeasibility, and redundant constraints.
		53-54	Solution of LPPs by simplex method - maximization and minimization cases. Shadow prices of the resources
		55-56	Identification of unique and multiple optimal solutions, unbounded solution, infeasibility and degeneracy.
		57-58	The dual problem: Formulation, relationship between Primal and Dual LPP, Primal and Dual solutions (excluding mixed constraints LPPs). Economic interpretation of the dual.
		59-60	Lab Practical

Evaluation Scheme:

No.	Component	Duration	Marks
1.	Internal Assessment		25
	• Quiz		
	• Class Test		
	• Attendance		
	• Assignment		
2.	End Semester Examination	3 hrs.	75

Details of the Course		
Unit	Contents	Contact Hours
1	Definition and types of matrix, Algebra of matrices, Inverse of a matrix- Business Applications. Solution of system of linear equations (having unique solution and involving not more than three variables) using matrix inversion method and Cramer's Rule. Leontief Input Output Model (Open Model Only).	8
2	Mathematical functions and their types (linear, quadratic, polynomial, exponential, logarithmic and logistic function). Concepts of limit and continuity of a function. Concept of Marginal Analysis. Concept of Elasticity, Applied Maxima and Minima problems including effect of Tax on Monopolist's Optimum price and quantity, Economic Order Quantity.	8
3	Partial Differentiation: Partial derivatives up to second order. Homogeneity of functions and Euler's theorem. Total differentials. Differentiation of implicit functions with the help of total differentials. Maxima and Minima involving two variables – Applied optimization problems and Constraint optimization problems using La grange multiplier involving two variables having not more than one constraint. Integration: Standard forms & methods of integration- by substitution, by parts and by use of partial fractions. Definite integration. Finding areas in simple cases Application of Integration to marginal analysis; Consumer's and Producer's Surplus. Rate of sales, The Learning Curve.	22
4	Rates of interest: nominal, effective and their inter-relationships in different compounding situations. Compounding and discounting of a sum using different types of rates. Applications relating to Depreciation of assets and Equation of value. Types of annuities: ordinary, due deferred, continuous, perpetual. Determination of future and present values using different types of rates of interest. Applications relating to Capital expenditure, Leasing, Valuation of simple loans and debentures, sinking fund. In addition to the lectures, the students are expected to work on a software package for solving linear programming problems, problems related to mathematics of finance and analyze the results obtained there from	12
5	Formulation of Linear programming problems (LPPs), Graphical solutions of LPPs. Cases of unique solutions, multiple optional solutions, unbounded solutions, infeasibility, and redundant constraints. Solution of LPPs by simplex method - maximization and minimization cases. Shadow prices of the resources, Identification of unique and multiple optimal solutions, unbounded solution, infeasibility and degeneracy. The dual problem: Formulation, relationship between Primal and Dual LPP, Primal and Dual solutions (excluding mixed constraints LPPs). Economic interpretation of the dual. In addition to the lectures, the students are expected to work on a software package for solving linear programming problems, problems related to mathematics of finance and analyze the results obtained there from.	10
	Total	60
Suggested Books:		
Sl. No.	Name of Authors/Books/Publishers	
1	Kapoor, V.K. Business Mathematics, Theory & Applications. Sultan Chand & Sons	

2	Sharma, S.K. & Kaur, Gurmeet. Business Mathematics. Sultan Chand
3	Thukral, J.K. Business Mathematics. Mayur Publications.
Mode of Evaluation:	Internal Assessment / End Semester Exam

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