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Lesson Plan (CORE, Semester IV~~I~~, January~~uly~~ to April ~~November~~2023~~2~~)

Name of Teacher	Dr. Nishtha Bhushan	**Department**	**Commerce**
Course	B.Com. (Hons.)	**Semester**	IV
Paper	Business Maths	**Academic Year**	2022-23 (Jan.-April)

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Learning Objectives

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

Learning Outcomes

1.Developing skills to solve business and economics problem through matrices.
2.Understanding real life application of maximization and minimization concepts of mathematics.
3. Calculation to arrive at an optimum solution to business or economics problems.
4. Understanding real world application and calculation of interest in various cases.
5. Developing competency to use software for mathematical calculation to arrive at an optimum solution to business or economics problems.

Lesson Plan

Week No.	Theme/Curriculum	Any Additional Information

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1-2	**UNIT I: Matrices and Determinants** • Definition and types of matrix, Algebra of matrices, Inverse of a matrix- Business Applications. Solution of system of linear equations using matrix inversion method and Cramer's Rule. Leontief Input Output Model	Assessment at the end of the Unit
3-4	**UNIT II: Calculus I** • Mathematical functions and their types. 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.	Assessment after the completion of the Unit
5-7	**UNIT III: Calculus II** **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 Lagrangian 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.	
8-11	**UNIT IV: Mathematics of Finance** 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.	Solving mathematics of finance problem using Excel and analyze the results obtained there from. Revision on topics like simple and compound interest, depreciation -Discussion in details on future value, present value, annuity, deferred annuity etc. -Use of log & antilog Tables, exponential Tables, Present/Future value of Tables
12-15	**UNIT V: Linear Programming Problem** Formulation of Linear programming problems (LPPs), Graphical solutions of LPPs. Various cases. 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:	Use of Solver (Excel) for solving linear programming problems. Assessment at the end.

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	Formulation, relationship between Primal and Dual LPP, Primal and Dual solutions (excluding mixed constraints LPPs). Economic interpretation of the dual.	

References

Additional Resources

1.

Online Resources (If Any)	
Assignment and Class Test Schedule for Semester	Link the assignment and Test (optional)

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