

Business Mathematics

Basic Information

Title: Business Mathematics

Code: BUS102

Credit Hours: 3 C.H.

Prerequisite(s): None

Classification: Compulsory Faculty Core

Course Description

This course emphasizes the basic mathematical concepts that a business student should be acquainted with. The main topics covered are: functional representation, sets, system of linear equations and inequalities, vectors and matrices, and basic differential and integral calculus. Business applications of these topics will be the orientation of the course.

Learning Objectives

- To refresh the student knowledge of elementary functions.
- To help students to refine their understanding of the systems of linear equations and their business applications.
- To develop students ability to manipulate sets, vectors and matrices to solve business problems.
- To teach students the basic concepts of linear inequalities.
- To have students acquire the essential concepts of calculus (differentiation and integration) and their application in business.

Learning Outcomes

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

- Model business problems in a mathematical format.
- Use mathematical concepts in different business disciplines.
- Use matrices to find business costs, revenue and profits.
- Apply differentiation concepts in cost minimization and profit maximization.
- Analyze curves through the use of integration to study business problems such as analyzing income concentration from raw data.

Course Outline

Module	Topic
Module 1: Elementary functions: graphs and transformation	1-Types Of Numbers 2-Basic Rules 3-Multiplication and Division Of Fractions 4-Cancellation Of Common Factor 5-Addition and Subtraction Of Fractions 6-Fractional Exponents 7-Multiplication Of Expressions 8-Graphing Functions 9-Quiz
Module 2: Linear functions and straight lines	1-Linear Equation 2-Process for solving Linear Equation 3-Distance Formula 4-The slope of straight line 5-Applications of linear equations 6-Systems of equations 7-Quiz
Module 3: Quadratic functions	1-The standard form of a quadratic equation 2-Solving by Factoring 3-Solving by using Formula 4-Applications of quadratic equation
Module 4: Additional elementary functions (polynomial, exponential, and logarithmic)	1-Introduction to Potynomial 2-Pascal's Triangle 3-Division Of Polynomials 4-Introduction to Logarithms 5-Simplifying log expression 6-The common and Natural Logarithms 7-Introduction to Exponential Function 8-Evaluation Of Exponential
Module 5: Sets and basic counting principles	1-Set Notation 2-Venn Diagrams & Set Notation 3-Set theory and Boolean Algebra 4-Quiz
Module 6: Matrices: basic operations	1-Definitions 2-Matrix Order 3-Equalizing of matrices 4-Addition and Subtracting of Matrices 5-Multiplication by A Scalar 6-Matrix Multiplication 7-The product of row-vector and a column-

Module	Topic
	vector 8-The product of two matrices 9-Multiplication rule 10-Unit Matrix 11-Multiplication by unit matrix 12-The determinant of a matrix 13- Determinants of 3 x 3 matrices 14-Quiz
Module 7: Inverse of a square matrix	1-The matrix inverse 2-Quiz
Module 8: Matrix equations and systems of linear equations	1-Matrix equations and system of linear equations 2-Quiz
Module 9: Systems of linear inequalities in two variables	1-Introduction 2-Ordering the real numbers 3-Notation 4-Simple rules for inequalities 5-Systems of linear inequalities 6-Quiz
Module 10: The derivative, introduction to limits, limits and Continuity	1-Introduction 2-Definition 3-One-Sided Limits 4-Right-handed Limit 5-Limit Properties 6-Computing Limits 7-Continuity
Module 11: Derivatives of constant, power forms, and sums	1-Introduction 2-Definition 3-Interpretations of the Derivative 4-Rate Of Change 5-Slope of Tangent Line 6-Velocity 7-Properties 8-Formulas 9-Product and Quotient Rule 10-Product Rule 11-Quotient Rule 12-Quiz
Module 12: Marginal analysis in business	1-Introduction 2-Marginal Cost 3-Revenue Function

Module	Topic
	4-Marginal Revenue 5-Elasticity 6-Quiz
Module 13: The first and the second derivate and graphs	1-Increasing and Decreasing Functions 2-The First Derivative Test 3-Global Extrema 4-The Second Derivative Test 5-Quiz
Module 14: Curve sketching techniques: unified and extended	1-Second Order Derivatives 2-Extrema On An Interval 3-Increasing and Decreasing Intervals 4-Concavity and Points of Inflection
Module 15: Optimization: absolute maxima and minima	1-Relative Minimums and Maximums 2-Saddle points 3-Absolute Minimums and Maximums 4-Quiz
Module 16: Integration: Anti-derivatives and substitution	1-Introduction 2-Indefinite Integrals 3-Definitions 4-Properties of the Indefinite Integral 5-Computing Indefinite Integrals 6-Substitution Rule for Indefinite Integrals 7-Quiz
Module 17: Area between curves and applications in business	1-Area between curves 2-Quiz
Activity	

*Delivery mode of each topic will be determined by instructor and could differ from one semester to the other.