College of Business and Economics
Department of Accounting and Finance

Course Number	AcFn1041
Course Title	Mathematics for Finance
Degree Program	**BA degree in accounting and finance**
Module	Computational and Quantitative Methods for Finance
ETCTS Credits	6
Contact Hours (per week)	4
Course Objectives & Competences to be Acquired	At the end of this course, students should be able to • Differentiate the various techniques of mathematics that can be employed in solving business problems • Identify the way mathematical techniques are utilized • Appreciate the importance of mathematics in solving real world business problems • Use different mathematical techniques for supporting managerial Decisions • Analyze real managerial problems using mathematical tools
Course Description	Mathematics for Finance is one of the preliminary quantitative aids to decision making that offers the decision-maker a method of evaluating every possible alternative (act or course of action) by using various techniques to know the potential outcomes. This course is designed to expose finance students to the basic concepts and area of managerial application of mathematics for decision making. Topics include: linear equations and their applications, matrix algebra and its applications, Markov chain analysis, linear programming, mathematics of finance, elements and application of calculus.

Course Contents

1. Linear Equations and Their Interpretative Applications
   - 1.1. Linear Equations, Functions and Graphs
   - 1.2. Applications of Linear Equations
     - 1.2.1. Linear Cost Output Relations,
     - 1.2.2. Cost, Total Revenue, and Total Profit
   - 1.3. Break Even Analysis: Model and Solutions

2. Matrix Algebra and Its Applications
   - 2.1. Matrix Concepts
   - 2.2. Dimensions and Types of Matrix
   - 2.3. Matrix Operations and Techniques
   - 2.4. Inverse of a Matrix
   - 2.5. Matrix Applications
   - 2.6. Solving Systems of Linear Equations
   - 2.7. Markov Chains: Concepts, Models and Solutions

3. Introduction to Linear Programming
   - 3.1. Concepts
   - 3.2. Formulation of Linear Programming Models
   - 3.3. The Maximization Problem

3.4. The Minimization Problem
3.5. Solution Approaches to Linear Programming Problem
3.5.1. Graphic Approach
3.5.2. Algebraic (Simplex) Approach

4. Mathematics of Finance
4.1. Overview of exponential and logarithmic functions
4.2. Simple Interest and Discount
4.2.1. Computing Simple Interest
4.2.2. Promissory Notes and Bank Discount
4.3. Compound Interest
4.3.1. Compound Amount (Maturity Value)
4.3.2. Present Value (Principal) of Compound Amount
4.3.3. Nominal and Effective Interest Rate
4.4. Ordinary Annuities
4.4.1. Sum of Ordinary Annuity
4.4.2. Sinking Fund Payments
4.4.3. Present Value of Ordinary Annuity
4.4.4. Amortization
4.5. Mortgage Payments

5. Elements and Applications of Calculus
5.1. Differential Calculus
5.1.1. Concept
5.1.2. Rules of Differentiation
5.1.3. First and Second Derivative for Extreme
5.1.4. Business Application of Differential Calculus
5.1.5. Marginal Analysis
5.1.6. Optimization Problems
5.2. Integral Calculus
5.2.1. Concept
5.2.2. Indefinite and Definite Integration
5.2.3. Rules of Integration
5.2.4. Business Applications of Integral calculus
5.2.5. Finding Total functions
5.2.6. Area problems

Text Book:

• Bowen Earl. Mathematics with applications in Business and Economics, 10th. 1987

Reference Books

- Salezman S. A. etal. Mathematics for Business. 8th Ed. 2007, Pearson Publishing limited.
- Nelda W. Roueche and Virginia H. Graves. Business Mathematics, 6th ed, 1993, Prentice Hall Limited
- Ronald E. Larson and Bruce H. Edwards. Finite Mathematics with Calculus, 1991
- Ann j. Hughes. Applied Mathematics: For Business, Economics, and the social Science, 1983.
- Barnett Raymond A. and Ziegler Michael R. Essentials of College Mathematics for business and Economics, life science and social science. 3rd Ed. 1989