Institute of Business & Information Technology
University of the Punjab
Quaid-e-Azam Campus, Lahore

Spring Term

Basic Information:

Title	Mathematics for Management Sciences	**Code**	GEN 155
Program	BBIT	**Credit Hours**	Three (03)
Sessions	30 Classes + Mid Term + Final Term	**Pre-Requisite**	GEN 150

Course Description:

This course is designed to introduce students several important methods in quantitative business analysis. The topics illustrate the major applications of functions, matrices and integral calculus in business administration. The key business concepts such as interest, annuities and shares markup and markdown will be discussed. Basic business statistical techniques and models will be illustrated. Sequence and series will be discussed with applications.

Learning Outcomes:

After the successful completion of this course, it is expected that students will be able to
1. *Deal their daily business problems with the help of Mathematics.*
2. *Understand the problems of their respective subjects where Mathematical rules and formulae are used and applied.*
3. *Develop confidence and competence in applying mathematical concepts and techniques learned to problem solving situations.*

Teaching Learning Methodology:

The formal teaching component of this course consists of active student participation in and contribution to all forms of teaching and learning i.e. lectures, discussions, quizzes and research assignments. Lectures will be twice a week of 90 min each.

Group Configurations:

One of the objectives of this course is to encourage and facilitate teamwork. Class will have to make a group of four for projects and research assignments. It is recommended that student will form their own groups. As a general guideline, your group should have members with diverse skill sets including people who are proficient or have aptitude for different subject areas.

Weekly Term Plan

Wk	Lecture Topic	Activity
01	*Introduction of Mathematics for Management Sciences*	
02	*Differentiation of Function and their Application in Business*	A~01
03	*Integral Calculus*	Quiz~01
04	*Application of Integral Calculus in Business*	
05	*Applications of Matrices in Business*	A~02
06	*Inequalities and Linear Programming*	Quiz~02
07	*Mathematics of Finance*	
08	*Concepts of Shares*	Quiz~03
09	***Mid Term Examination***	
10	*Descriptive Statistics and Probability Theory*	
11	*Probability Distributions*	
12	*Correlation and Regression Analysis*	A~03
13	*Correlation and Regression Analysis*	Quiz~04
14	*Functions of Two or More Variables*	
15	*Sequence and Series*	Quiz~05
16	*Application of Sequence Series in Business*	A~04
17	***Final Term Examination***	

Spring Term
Topics in Detail

Mathematics for Management Sciences
Introduction

Differentiation of Function
Functions
Single-valued function,
Many-valued Function
Explicit and Implicit Function
Even and Odd Function
Algebraic Function
Transcendental Function
Inverse Function

Applications of Differential Functions in B & E
Demand Function, Supply Function,
Cost Function, Total Cost Function,
Average Cost Function, Marginal Cost Function,
Revenue Function, Profit Function

Integral Calculus
The Indefinite Integral
The Power Rule
Exponential and Logarithmic Functions
The Definite Integral
Area under the Curve
The Fundamental Theorem of Calculus
Integration by Parts
Integrals in Business and Economics

Applications of Matrices in Business
Input-Output Analysis
Leontief Input-Output Models
Matrices in Microsoft Excel

Inequalities and Linear Programming
Linear Inequalities in Two Variables
The Simplex Method: Maximization
Non-unique Solutions
Multiple Solutions and No Solution
The Simplex Method
Duality and Minimization

Mathematics of Finance
Simple Interest
Arithmetic Sequences
Compound Interest
Geometric Sequences
Future Value of Annuities
Loans and Amortization

Concepts of Shares
Shares, Stock Exchange,
Nature of Shares
Face Value, Book Value, Market Value
Brokerage, Dividend
Types of Shares
Equity Shares
Preferential Shares
Bonus Shares

Descriptive Statistics and Probability Theory
Probability
Unions and Intersections of Events
Conditional Probability
The Product Rule
Bayes' Formula
Permutations, Combinations, and Probability

Probability Distributions
Random Variables and Probability Distributions
Histograms
Measure of Central Tendency and Variation
Binomial Probability Distribution
Normal Probability Distribution

Correlation and Regression Analysis
Correlation
Types of Correlation
Scatter Diagram
Karl Pearson's Correlation Coefficient
Rank Correlation
Spearman's Rank Correlation Coefficient
Regression Analysis
Dependent and Independent Variables
Regression Equations

Sequence and Series−Its Application to Business
Different Types of Sequence
Finite Sequence, Infinite Sequence
Fibonacci Sequence
Kinds of Sequence
Arithmetic Sequence
Geometric Sequence
Arithmetic and Geometric Means
Arithmetic Progression (AP)
Geometric Progression (GP)
Recurring Decimals as Geometric Progression
Harmonic Progression (HP)
Harmonic Mean

Text & Recommended Readings

A. Mathematical Applications
   Ronald J. Hershberger and James J. Reynolds.
B. Introductory Mathematical Analysis for Business and Economics
   Frank S. Budnick
C. Thomas Calculus, 11th Edition.
D. Calculus, Concept and Context
   James Stewart.
E. Pre-Calculus
   Raymond S. Barnet and Michael R. Ziegler.

Assignment Specification

Pages of A4 Size, without borders

Spring Term

Grading Policy:

Final Grade for this course will be the cumulated result of the following term work with relevant participation according to the quoted percentage.

Sessional	25%		Mid Term	35%		Final Term	40%
Assignments	10 %		Mid Term Exam	25%		Final Exam	30%
Quizzes	10%		Major Report/Work	10%		Case Study/ Project/	10%
Presentations	05%					Term Paper	

Remember subdivision of Mid Term and Final Term Examination should be done only in extreme cases of very essential and major Grading Instruments.

Dishonest Practices & Plagiarism

Any student found responsible for dishonest practice/cheating (e.g. copying the work of others, use of unauthorized material in Grading Instruments) in relation to any piece of Grading Instrument will face penalties like deduction of marks, grade 'F' in the course, or in extreme cases, suspension and rustication from IBIT.

For details consult PU Plagiarism Policy at http://pu.edu.pk/dpcc/downloads/Plagiarism-Policy.pdf

Grading System:

Letter Grade	Grade Point	Num Equivalence
A	4.00	85 – 100 %
A-	3.70	80 – 84 %
B+	3.30	75 – 79%
B	3.00	70 – 74 %
B-	2.70	65 – 69 %
C+	2.30	61 – 64 %
C	2.00	58 – 60 %
C-	1.70	55 – 57 %
D	1.00	50 – 54 %
F	0.00	Below 50 %
I	Incomplete	*
W	Withdraw	*

Norms to Course:

✓ *Submission Date and Time for the term instruments is always* **Un-Extendable**
✓ *5 Absentees in class will result in forced withdrawal.* **(PU Policy)**
✓ *Re-sit in Mid and Final Term will cause you a loss of 2 and 3 grade marks respectively.* **(PU Policy)**
✓ *This is your responsibility to keep track of your position in class evaluation units.*
✓ *After the submission date, NO excuse will be entertained.*
✓ *Keep a copy of all submitted Grading Instruments.*
✓ *Assignment is acceptable only in its Entirety.*
✓ *No make up for any assignment and quiz.*
✓ *Copied & Shared work will score Zero.*
✓ *Assignments are Individual.*

Good Luck
For the Spring Term