Basic Information:

Title:	Introductory Mathematics	**Code**	GEN 150
Program:	BBIT	**Credit Hours:**	Three (03)
Sessions:	30 Classes + Mid Term + Final Term	**Pre-Requisite:**	None

Course Description:

This course will able to gain an understanding and necessary knowledge of function, limit, derivatives, integration, linear and quadratic equations that will help in solving business problems. 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
01	*General Introduction of Education, Science and Mathematics*
02	*Number Systems and Basics of Business Mathematics*
03	*Matrices and Determinants*
04	*System of Linear Equations with One and Two Variables*
05	*Quadratic Equations in Solving Business Problems*
06	*Roots of Quadratic Equations and Plane Curves*
07	*Sequence and Series*
08	*Mathematical Induction*
09	*Mid Term Examination*
10	*Trigonometry and its applications*
11	*Functions, Limits and Its Continuity*
12	*Derivatives, Differential Formula and Its Applications*
13	*Integration and Definite Integral Its Applications*
14	*Integration and Definite Integral Its Applications*
15	*Graph and its Applications*
16	*Graph and its Interpretation*
17	*Final Term Examination*

Topics in Detail

Introduction
- *Science and Mathematics*
- *Mathematical use of Excel*

Number Systems
- *Binary System*
- *Decimal System*
- *Octal System*
- *Hexadecimal System*

Basics of Business Mathematics
- *Profit/Loss*
- *Mark-up; Simple & Compound*
- *Unitary Method*
- *Zakat Calculation*
- *Business Math using Excel*

Function
- *Types of Functions*
- *Implicit and Explicit Functions*
- *Homogeneous and Non-Homogeneous Functions*
- *Limit and Continuity*
- *Applications in Economic and Business*

Matrices & Determinants
- *Introduction*
- *Sum, Difference and Products*
- *Additive and Multiplicative Inverse*
- *Determinants and their Properties*
- *Cramer's Rule*
- *Row Operation and Rank of Matrices*
- *Matrices in Excel*

Sequence and Series
- *Arithmetic Progression, Mean, Series*
- *Geometric Progression, Mean, Series*
- ***Binomial Theorem***
- ***Binomial Series***

Mathematical Induction
- *Introduction to Induction*
- *Sum of n, n^2, n^3 terms*

Trigonometry
- *Introduction*
- *Trigonometric Functions*
- *Coordinate System*
- *Trigonometric Identities*
- *First Fundamental Formula*

Derivatives
- *Derivatives as A Function*
- *Differential Rules*
- *Chain Rule*
- *Derivative of Logarithmic Functions*
- *Derivatives of Exponential Functions*

Integration
- *Why Integration?*
- *Indefinite Integral*
  - *Evaluation Techniques*
  - *Integration by Substitution*
  - *Integration by Parts.*
- *Definite Integral*
  - *Substitution Method*
  - *Area Between Curve*
- *Applications of Integration*

Linear Equation
- *General Equation of Line $y = mx + c$*
- *Different ways to calculate slope 'm'*
- *System of Linear Equations in Single Variable*
- *System of Linear Equations in Two Variables*

Quadratic Equations
- *Solution Techniques*
  - *Factorization*
  - *Complete Square*
  - *Quadratic Formula*
- *Quadratic Equations Types*
  - *Nature of Its Roots*
  - *Generating Equation from Roots*
- ***Quadratic Equation and Plane Curves***
  - *Circle, Ellipse, Parabola, Hyperbola*
  - *Asymptotes to Curves*

Graph and Application
- *Introduction to Graph*
- *Plotting a Graph*
- *Graph Interpretation*
- *Types of Graph*
  - *XY Scatter*
  - *Pie Graph*
  - *Bar Graph*
  - *Comparative Graphs*
- *Graph in Excel*

Text & Recommended Readings

A. *Mathematical Applications*
Ronald J. Harshbarger and James J. Reynolds.
Thomas Calculus, 11th Edition.

B. *Calculus, Concept and Context*
James Stewart.

C. *Introductory Mathematical Analysis for Business and Economics.*

Assignment Specification

Assignment Pages of A4 Size, without borders

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 %						
Quizzes	10%						
Presentations	05%						

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 Plagiarism Policy of PU 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**.
- ✓ *7 Absentees in class will be 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