SUKKUR IBA UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE

PRECALCULUS

ABET-2000 COURSE BINDER
MTS-101
FALL 2022

MTS-101: Pre-Calculus

1. General Information

Course Number	MTS-101
Credit Hours	Non-Credit
Prerequisite	None
Course Coordinator	Not Specified

2. Course Overview

Pre-calculus is a course designed to prepare students for future calculus courses by covering advanced mathematical concepts, functions, and theories that may not be covered in algebra, geometry, and other courses in a student's mathematics curriculum. Pre-calculus will commonly focus on the properties of functions with the study of trigonometric, logarithmic, and exponential functions. Students will learn about sequences, limits, and other concepts essential to the study of calculus.
In this course, you will prepare for calculus by focusing on quantitative reasoning and functions. As you begin the course, you should already have a strong understanding of algebraic skills such as factoring, basic equation solving, and the rules of exponents and radicals. You will concentrate primarily on linear, exponential, logarithmic, polynomial, rational, and trigonometric functions.

3. Catalog Description

MTS-101

4. Course Content

Week	Topics	Quizzes Assignments	Suggested reading
Week 01	**Complex Number:** What are the imaginary numbers? What are complex numbers? The complex plane: Adding and subtracting complex numbers: Distance and midpoint of complex numbers: Multiplying complex numbers: Complex conjugates and dividing complex numbers Identities with complex numbers: Complex numbers Absolute value and angle of complex numbers: The polar form of complex numbers: Multiplying and dividing complex numbers in polar form		Pre-Calculus Mathematics for Calculus by James Stewart, Lothar Redlin, and Saleem Watson
Week 02	**Algebra and Equations** Real numbers Polynomials Factoring Exponents and Radicals First-degree equations Quadratic Equations		
Week 03	**Graph, Lines, and, Inequalities** Graphs Equations of line Linear inequalities Distance and Midpoint Formula		

Week 03-04	**Functions and Graphs** Function Graph of function Linear, Quadratic, and polynomial functions Exponential and logarithmic functions Applications of function	Assignment-I Quiz-I	
Week 05	**Composite functions** Composing functions Modeling with composite functions Verifying the inverse functions by the composition Invertible function		Pre-Calculus Mathematics for Calculus by James Stewart, Lothar Redlin, and Saleem Watson
Week 06	Synthetic division Polynomial division Remainder and factor theorem Zeros of polynomial functions The binomial theorem		
Week 07	**Trigonometric Functions and Analytical Trigonometry** Fundamental identities and basic formulas of trigonometry Inverse trigonometric functions	Assignment-II	
Week 08	Solving trigonometric equations Problem-solving techniques Practice problems	Quiz-II	
Week 09	Matrices System of linear equations Applications of the system of linear equations		
Mid-Term			
Week 11-12	**Conic Sections** Introduction to conic sections The features of a circle Standard equation of a circle Expanded equation of a circle Center and radii of an ellipse		Pre-Calculus Mathematics for Calculus by James Stewart, Lothar Redlin, and Saleem Watson
Week 12-13	Foci of an ellipse Focus and directrix of a parabola Introduction to hyperbolas Foci of a hyperbola Identifying conic sections from their equations	Assignment-III	
Week 13-14	**Series** Arithmetic sequences Geometric sequences Geometric series Geometric series (with summation notation) Arithmetic series	Quiz-III	
Week 15	**Vectors** Vectors introduction Magnitude of vectors Scalar multiplication Vector addition and subtraction Unit vectors		
Final-Term			

5. Text Book

1. Pre-Calculus Mathematics for Calculus by James Stewart, Lothar Redlin, and Saleem Watson 8th Edition

6. Reference Material

1. Pre-Calculus by Michael Sullivan
2. Pre-calculus by Robert F. Blitzer.

7.

Component	**Weighting**
Quizzes (3 Quizzes, count Best of two for grading)	8%
Assignments (3 Assignments)	9%
Class Participation (Board Activities)	3%
Mid-Term	30%
Final Exam	50%

8. Course Learning Outcomes

	Course Learning Outcomes (CLOs)
1	Students will be able to apply the knowledge of basic mathematics including Algebra, Function, Transcendental function, Trigonometry, Sequence & Series, and Vectors.
2	Students will be able to identify and analyze the mathematical functions for solving the computing problems.

9. PLO-CLO Map

	CLO IDs										
PLO ID	**GA1**	**GA2**	**GA3**	**GA4**	**GA5**	**GA6**	**GA7**	**GA8**	**GA9**	**GA10**	**GA11**
1	1	0	0	0	0	0	0	0	0	0	0
2	0	1	0	0	0	0	0	0	0	0	0

Approval

Prepared By	Iftikhar Ahmed Bhutto
Approved By	
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