



NORTH SOUTH UNIVERSITY

Center of Excellence in Higher Education

The first private university in Bangladesh

Department of Mathematics and Physics

Course Name:	Pre-Calculus
Course Code	MAT 116
Section No:	
Semester:	Spring 2023

INSTRUCTOR & DEPARTMENT INFORMATION

Instructor Name:	
Office Room:	
Office Hours:	
Office Phone:	
Email Address:	
Department:	Mathematics and Physics
Links:	North South University Website: http://www.northsouth.edu Department Website: http://www.northsouth.edu/academic/seps/dmp.html

COURSE & SECTION INFORMATION

Class Time	
Location	
Course Credit Hours	3:0
Course Description	Behavior of functions in some depth including properties, graphs, inverse, transformations, compositions. This course pays particular attention to linear, quadratic, polynomial, rational, exponential and logarithmic functions. It covers trigonometric functions and inverse trigonometric functions as well.
Course Objectives	The course will help students to recognize various kinds of functions (including polynomial, rational, radical, exponential, trigonometric and logarithmic functions), analyze their behavior. Also, the students will be able to graph various functions and apply the acquired concept in higher studies and physical problems.
Student Learning Outcomes	Upon the successful completion of this course, a student will be able to: CO-1. Demonstrate the fundamental concept of mathematical functions and their properties (domain, range, composition, etc.). Perform function operations including composition, transposition, and finding inverse functions. CO-2. Plot different types of functions,–apply various kinds of transformations to those functions including translations, reflections, stretches, and compressions CO-3. Analyze and interpret graphically the linear, polynomial, rational, exponential, logarithmic and trigonometric functions.

CO-4. Solve linear, quadratic, polynomial, exponential, and logarithmic equations and inequalities involving polynomials and rational expressions apply them to model and analyze real world problems.

CO-5. Develop the prerequisite knowledge and mathematical skills necessary to undertake higher level courses which have a quantitative focus.

Mapping of Course Outcomes

	Course Outcomes (CO)	Bloom's taxonomy domain/level (C: Cognitive P: Psychomotor A:Affective)	Delivery methods and activities	Assessment tools
CO-1	Demonstrate the fundamental concept of mathematical functions and their properties (domain, range, composition, etc.). Perform function operations including composition, transposition, and finding inverse functions.	C1 C2 P1	Lecture Discussion	Class work, Quiz, Mid term
CO-2	Plot different types of function and apply various kinds of transformations to those functions including translations, reflections, stretches, and compressions.	C3 C4 P1	Lecture, Classroom presentation, discussion	Midterm exam, Assignment
CO-3	Analyze and interpret graphically the linear, polynomial, rational, exponential, and logarithmic and trigonometric functions.	C4 P1		
CO-4	Solve linear, quadratic, polynomial, exponential, and logarithmic equations and inequalities involving polynomials and rational expressions, and apply them to model and analyze real world problems.	C3 C4	Lecture Discussion	Class work, Quiz, Assignment, Final Exam
CO-5	Develop the prerequisite knowledge and mathematical skills necessary to undertake higher level courses which have a quantitative focus.	C4 P1	Lecture Discussion	Assignment

LEARNING RESOURCES AND TEXTBOOK(S)

	Text Book	Reference Book
Author	Michael Sullivan	
Title	"Pre-calculus"	
Edition & Year	10th Edition, 2016	

TEACHING STRATEGY

The class will be conducted through various activities including discussion of concepts and problem-solving, student initiative and active involvement as well as the practice of quantitative problems. Students are expected to actively involve and to take initiative for their own learning experience

ASSESSMENT STRATEGY		GRADING POLICY		
Grading tool	Points	Numerical Scores	Letter Grade	Grade Points
Attendance	10%	93 +	A (Excellent)	4.0
Assignments	10%	90 - 92	A-	3.7
Quizzes	20%	87 - 89	B+	3.3
Midterm	20%	83 - 86	B (Good)	3.0
Final Exam	40%	80 - 82	B-	2.7
		77 - 79	C+	2.3
		73 - 76	C (Average)	2.0
		70 - 72	C-	1.7
		67 - 69	D+	1.3
		60 - 66	D (Poor)	1.0
		Below 60	F (Failure)	0.0

Important note: Assessment strategy may change depending on the directives of UGC and NSU.

Classroom Rules of Conduct

Please Refer to NSU Student Handbook, Sections: "Disciplinary Actions" and "Procedures and Guidelines".

Exams & Make-up Exam Policy

NO makeup for quizzes and NO Formative assessment will be retaken under any circumstances. If a student misses the Midterm exam and/or Final exam due to the circumstances beyond their control (official valid documents are required) and informed beforehand (if possible), reasonable arrangement may be considered. Please note the retake exam questions are generally a bit tricky and critical compare to the regular exam questions. **Students may get the opportunity to see/recheck their midterm and Final exam scripts.**
Cell phones are prohibited in exam sessions.

Attendance Policy: As per NSU policy.

COURSE CONTENTS & SCHEDULE

Lecture No.	Topic	Learning Activities	Assessment tools	Learning Outcome	Chapter
1-2	The Distance and Midpoint Formulas	Lecture Assignment I	Midterm Quiz 1	CO-1	1.1
3-4	Graphs of Equations in Two Variables: Intercepts; Symmetry	Lecture Assignment I	Midterm Quiz 1	CO-2	1.2
5-7	Lines, Circles	Lecture Assignment I	Midterm Quiz 2	CO-1 CO-2	1.3,1.4
8-9	Functions, The graph of functions, Properties of functions	Lecture Assignment II	Midterm Quiz 2	CO-1	2.1 2.2 2.3
10-12	Library of functions, Piecewise-defined functions, Graphing Techniques	Lecture Discussion Assignment II	Midterm	CO-1	2.4 2.5
13	Linear functions and their properties	Lecture Assignment II	Midterm	CO-1	3.1
14-15	Quadratic functions and Models	Lecture	Midterm	CO-1 CO-3	3.3 3.4
16	Midterm				
17-18	Polynomial functions	Lecture	Final Exam Quiz 3	CO-1 CO-2	4.1
19-20	Properties and Graph of Rational Functions	Lecture Assignment III	Final Exam Quiz 3	CO-1 CO-2	4.2 4.3
21	Polynomial & Rational Inequalities	Lecture Assignment III	Final Exam	CO-1	4.4
22-23	The real zero of a Polynomial function	Lecture Assignment III	Final Exam Quiz 4	CO-1	4.5
24	Complex zeros, Fundamental Theorem of Algebra	Lecture	Final Exam Quiz 4	CO-1	4.6
25	Composite functions, Inverse functions	Lecture	Final Exam Quiz 4	CO-1	5.1 5.2
26-27	Exponential functions, Logarithmic functions	Lecture Discussion	Final Exam Quiz 5	CO-1	5.3 5.4
28-29	Properties of Logarithms, Logarithms & Exponential equations	Lecture Assignment IV	Final Exam Quiz 5	CO-1	5.5 5.6
30-31	Angles & their measure, Trigonometric functions: Unit circle approach	Lecture Assignment IV	Final Exam	CO-1	6.1 6.2
32-33	Properties and graph of Trigonometric functions	Lecture Assignment IV	Final Exam	CO-1 CO-2	6.3 6.4 6.5
34-36	The inverse Sine, Cosine, and Tangent functions, The inverse trigonometric functions	Lecture	Final Exam	CO-1	7.1 7.2
Final Exam (Declared by the Controller of Examinations)					

Note: The instructor reserves the right to make changes to the syllabus if necessary.