Department of Mathematics and Physics

Course Name:	**Pre-Calculus**
Course Code	**MAT 116**
Section No:	**08**
Semester:	**Summer 2021**

INSTRUCTOR & DEPARTMENT INFORMATION

Instructor Name:	Afroja Parvin
Office Room:	1133
Office Hours:	**3.00 PM- 4.00 PM (MW)**
Office Phone:	
Email Address:	afroja.parvin@northsouth.edu
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	**2:40 PM-4:10 PM (ST)**
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

	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 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**
Assessment (viva)	5%	93 +	A (Excellent)	4.0
Attendance	10%	90 - 92	A-	3.7
Assignments	10%	87 - 89	B+	3.3
Quizzes	20%	83 - 86	B (Good)	3.0
Midterm	25%	80 - 82	B-	2.7
Final Exam	30%	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

1. Electronic devices e.g**. cell phone**, **notepad, iPad, iPod, mp3, etc** are strictly prohibited in the class.

2. It is imperative that the students maintain absolute discipline in class. Students are also expected to arrive on time for the class, as frequent late attendance will not be accepted.

3. **Academic Integrity Policy:** Department of Mathematics and Physics does not tolerate academic dishonesty by its students. At minimum, students must not be involved in cheating, copyright infringement, submitting the same work in multiple courses, significant collaboration with other individuals outside of sanctioned group activities, and fabrications.

Students are advised that violations of the Student Integrity Code will be treated seriously, with special attention given to repeated offences.

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

EXAMS & MAKE UP POLICY

Three quizzes will be taken (best **Two** will be considered). **NO makeup for quizzes will be taken under any circumstances.** If a student misses any of the Midterm exams **only** due to extreme emergencies (official material evidence is required), the instructor will take the decision for his/her makeup exams. There will be **no extra question** in the Midterm and Final exams, so that students should have to answer all of the questions given in the question paper.

Cell phones are **prohibited** in exam sessions.

ATTENDANCE POLICY

Students are required and expected to attend all classes regularly and on time and participate in class discussions. North South University mandates to fail students who are absent 25% or more from their classes, even if such absences are excusable. If a student misses more than two lectures, marks will be deducted for each day of absence. Absence due to extreme situations will be considered an exception, as per the instructor's decision. It is the responsibility of the student to become aware of other course-related announcements missed during an absence.

Please Refer to NSU Student Handbook, Section: "Study Principles and Policies"

COMMUNICATION POLICY

All communications should take place using the instructor's **email**. Announcements in class will override any statement made here or in any other handouts. It is the student's responsibility to be aware of any announcements made in class.

APPROPRIATE USE POLICY

All members of the North South University community must use electronic communications in a responsible manner. The University may restrict the use of its computers and network systems for electronic communications subject to violations of university policies/codes or local laws or national laws. Also, the university reserves the right to limit access to its networks through university-owned or other computers, and to remove or limit access to material posted on university-owned computers.

STUDENTS WITH SPECIAL NEEDS

North South University will provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities/special needs that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their instructors to ensure that their needs are met. The University through its Special Need section will exert all efforts to accommodate special needs.

Special Needs Section

Telephones: +88-02-5566 8200 ext-1220
Location: Room # 413/A**,** Admin Building **(**4th floor).

Please Refer to NSU Student Handbook, Section: "Special Needs Services"

STUDENTS COMPLAINTS POLICY

Students at North South University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

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