



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:	Section 3&4
Semester:	Summer 2019

INSTRUCTOR & DEPARTMENT INFORMATION	
Instructor Name:	Sharmin Sultana
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Office Hours:	12.30: 2:30 (ST & MW)
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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 an understanding of 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 function and apply various kinds of transformations to those functions including translations, reflections, stretches, and compressions.

	<p>CO-3. Analyze and interpret graphically the linear, polynomial, rational, exponential, logarithmic and trigonometric functions.</p> <p>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.</p> <p>CO-5. Develop the prerequisite knowledge and mathematical skills necessary to undertake higher level courses which have a quantitative focus.</p>
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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 an understanding of 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, logarithmic and trigonometric functions.	C4, P1	Lecture Discussion	Midterm exam, Assignment
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.	C1,C4, P1	Lecture Discussion	Assignment

LEARNING RESOURCES AND TEXTBOOK(S)

Text Book		Reference Book
Author	Michael Sullivan	
Title	“Pre-calculus”,	
Edition & Year	10h Edition	

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 AND GRADING SCHEME	
Grading tool	Points
Attendance	05%
Assignment	05%
Quiz	15%
Midterm I	20%
Midterm II	20%
Final Exam	35%

Please Refer to NSU Student Handbook, Section: “Grading Policy”

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

Four quizzes will be taken (best **Three** out of **Four** 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 exam script.

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. Students not missing any course lectures and exams will receive an attendance bonus of 2% of total marks.

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.

COURSE CONTENTS & SCHEDULE

Lecture No.	Topic	Learning Activities	Assessment tools	Learning Outcome	Chapter
1	The Distance and Midpoint Formulas	Lecture	Discussion Midterm I	CO-1	1.1
2	Graphs of Equations in Two Variables: Intercepts; Symmetry	Lecture Assignments	Problem solving, Quiz, Midterm I	CO-2	1.2
3	Lines, Circles	Lecture Discussion	Quiz, Midterm I	CO-1, CO-2	1.3, 1.4
4	Functions, The graph of a functions	Lecture Assignments	Midterm I , Quiz	CO-1	2.1, 2.2
5	Properties of functions, Library of functions	Lecture Assignments	Midterm I Assignment	CO-1	2.2, 2.3
6	Piecewise-defined functions, Graphing Techniques, Transformation	Lecture Discussion	Midterm I, Quiz	CO-1, CO-2	2.4, 2.5
7	Linear functions and their properties	Lecture Assignments	Midterm I	CO-1	3.1
8	Midterm I				
9	Quadratic functions and Models, Inequalities involving quadratic functions	Lecture	Midterm II	CO-1, CO-3	3.3, 3.4, 3.5
10	Polynomial functions	Lecture Discussion	Midterm II Quiz	CO-1, CO-2	4.1
11	Properties of Rational Functions	Lecture Assignments	Midterm II Assignment	CO-1	4.2
12	The Graph of a Rational Function	Lecture Discussion	Midterm II	CO-2	4.3
13	Polynomial & Rational Inequalities	Lecture	Midterm II	CO-1	4.4
14	The real zero of a Polynomial functions	Lecture Assignment	Midterm II Assignment	CO-1	4.5
15	Complex zeros, Fundamental Theorem of Algebra	Lecture	Midterm II Quiz	CO-1	4.6
16	Midterm II				
17	Composite functions, Inverse functions	Lecture Assignment	Final Assignment	CO-1	5.1, 5.2
18	Exponential functions, Logarithmic functions	Lecture Discussion	Final Quiz	CO-1	5.3, 5.4
19	Properties of Logarithms , Logarithms & Exponential equations	Lecture Assignment	Final Assignment	CO-1	5.5, 5.6
20	Angles & their measure, Trigonometric functions: Unit circle approach	Lecture Assignment	Final	CO-1	6.1, 6.2
21	Properties of Trigonometric functions	Lecture	Final	CO-1	6.3
22	Graphs of the Sine & Cosine functions Graphs of the Tangent, Cotangent and Secant functions	Lecture	Final	CO-2	6.4, 6.5
23	The inverse Sine, Cosine and Tangent functions,	Lecture Assignment	Final Quiz	CO-1	7.1
24	The inverse trigonometric functions	Lecture Discussion	Final Discussion	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.