BRONX COMMUNITY COLLEGE
of the City University of New York
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

SYLLABUS: MTH 30 - Precalculus (4 Credits - 4 Hours per week)

Prerequisite: MTH 6 or equivalent, and if required ENG 2 and RDL 2
TEXT: <u>**Precalculus Essentials (Fifth Edition)**</u> **by Robert Blitzer, Pearson**
                   ISBN 978-0-13-457815-6

This course is a **Pathways Core B (Mathematical and Quantitative Reasoning) Course**:
A course in this area must meet all of the following learning outcomes. A student will:

a) Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
b) Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
c) Represent quantitative problems expressed in natural language in a suitable mathematical format.
d) Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
e) Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.
f) Apply mathematical methods to problems in other fields of study.

Course Learning Outcomes   **(Pathways Learning Outcomes contributed to)**
On successful completion of this course a student will be able to:

1. Solve factorable polynomials equations and inequalities of at least 3rd degree in one real variable and 2nd degree rational equations and inequalities in one real variable (b, c, e)
2. Graph polynomial, rational, exponential, logarithmic, sine and cosine functions (b, d, e, f)
3. Verify trigonometric identities and solve trigonometric equations (b, d)
4. Employ transformations of functions algebraically and graphically as problem-solving tools (b, c)
5. Compute inverse functions and use their properties to obtain more precise algebraic and graphical information about the corresponding original functions (a, b, c)
6. Demonstrate fluency with function notation and operations on functions including composition (b, c)
7. Identify whether a given graph or algebraic relation represents a function and analyze it to determine its particular properties such as domain and range, end behavior, asymptotes, and periodicity (a, c, d)
8. Form models to apply them in the solution of real-world problems such as involving exponential growth and decay and optimization in finance, biology, chemistry, or physics (a, b, c, d, e, f)

<u>SECTION</u>	<u>TOPIC</u>	<u>SUGGESTED EXERCISES</u>

Functions and Graphs

1.2	Basics of Functions and their Graphs	176/ 11-31 (odd), 45, 47, 53-57, 71, 72, 75-81
1.3	More on Functions and their Graphs	195/ 11, 15, 17, 23, 85-92, 97
1.6	Transformations of Functions	241/ 1-87 (odd)
l.7	Combinations of Functions; Composite Functions	258/ 5-11, 17-33, 51-59, 83-94
1.8	Inverse Functions	269/ 1-5, 11-24, 29-37, 53-58

SECTION	**TOPIC**	**SUGGESTED EXERCISES**

Polynomial and Rational Functions

2.2	Quadratic Functions	330/ 9-55 (odd)
2.3	Polynomial Functions and Their Graphs	348/ 3-7, 15-21, 25, 27-33, 37, 39, 41-47
2.4	Dividing Polynomials; Remainder and Factor Theorems	363/ 13, 15, 17-25, 33-41
2.5	Zeroes of Polynomial Functions	377/ 1-16, 17-31 (odd), 53-55, 58, 59
2.6	Rational Functions and Their Graphs	398/ 1-14, 21-28, 37-43, 45, 49, 57, 63, 71, 77-80
2.7	Polynomial and Rational Inequalities	412/ 1-23 (odd), 43-45, 55-57, 69, 70

Exponential and Logarithmic Functions

3.1	Exponential Functions	448/ 11-17, 19-31, 35-37, 41, 43
3.2	Logarithmic Functions	463/ 1-29, 43, 44, 47-53, 55, 59, 63, 71, 75-79, 81-89
3.3	Properties of Logarithms	475/ 1-27, 35, 37, 41-57, 67, 71-77, 83-86
3.4	Exponential and Logarithmic Equations	488/ 1-21, 27-43, 49-57, 69-71, 87, 89

Trigonometric Functions

4.1	Angles and Radian Measure	532/ 1-10, 13-28, 41-56, 60-63
4.2	Trigonometric Functions: The Unit Circle	547/ 1-55
4.3	Right Triangle Trigonometry	560/ 3-15, 21-31
4.4	Trigonometric Functions of Any Angle	575/ 1-21, 23-27, 35-43, 61-73
4.5	Graphs of Sine and Cosine Functions	595/ 1-25 (odd), 43-49
4.7	Inverse Trigonometric Functions	626/ 1-11, 19-41, 47-53, 63-67

Analytic Trigonometry

5.1	Verifying Trigonometric Identities	658/ 1-35
5.2	Sum and Difference Formulas	668/ 1, 3, 5, 13, 15, 21, 23, 33-36
5.5	Trigonometric Equations	703/ 11, 15, 19-22, 25-28, 39, 41, 57, 59

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Bronx Community College respects and welcomes students of all backgrounds and abilities. In the event you encounter any barrier(s) to full participation in this course due to the impact of a disability, please contact the disAbility Services Office as soon as possible this semester. The disAbility Services specialists will meet with you to discuss the barriers you are experiencing and explain the eligibility process for establishing academic accommodations for this course. You can reach the disAbility Services Office at: disability.services@bcc.cuny.edu, Loew Hall, Room 211, (718) 289-5874.