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: Precalculus by Jay Abramson, OpenStax
https://openstax.org/details/books/precalculus, online or pdf

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)

Academic Integrity: Academic dishonesty (such as plagiarism and cheating) is prohibited at Bronx Community College and is punishable by penalties, including failing grades, dismissal and expulsion. For additional information and the full policy on Academic Integrity, please consult the BCC College Catalog.

Accommodations/Disabilities: 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.

SECTIONS	TOPICS	SUGGESTED EXERCISES (page/exercise #)
Chapter 1 Functions		
1.1	Functions and Function Notation	18/6-19, 27-33, 40-47, 52-75
1.2	Domain and Range	35/6-25, 27-37
1.3	Rates of Change and Behavior of Graphs	48/5-21
1.4	Composition of Functions	60/5-17, 72-76
1.5	Transformation of Functions	85/6-19, 24-26, 49-52
1.6	Absolute Value Functions	98/20-34
1.7	Inverse Functions	110/7-12,16
Chapter 2 Linear Functions		
2.1	Linear Functions	139/20-37
2.2	Graphs of Linear Functions	159/6-29, 44-58, 65-69
Chapter 3 Polynomial and Rational Functions		
3.2	Quadratic Functions	221/6-25, 53-64
3.3	Power Functions and Polynomial Functions	236/17-30
3.4	Graphs of Polynomial Functions	254/6-23, 30-47
3.5	Dividing Polynomials	264/14-26, 29-35, 38-43, 49-53
3.6	Zeros of Polynomial Functions	276/22-32, 40-43, 46-49 (No Descartes' Rule)
3.7	Rational Functions	295/6-29, 39-43
Chapter 4 Exponential and Logarithmic Functions		
4.1	Exponential Functions	340/14-17
4.2	Graphs of Exponential Functions	352/11, 12, 26-28
4.3	Logarithmic Functions	361/6-53
4.4	Graphs of Logarithmic Functions	377/6-15, 26-43
4.5	Logarithmic Properties	389/3-29
4.6	Exponential and Logarithmic Equations	399/4-50
Chapter 5 Trigonometric Functions		
5.1	Angles	455/6-23, 26-45, 50-57
5.2	Unit Circle: Sine and Cosine Functions	470/6-53, 60-69
5.3	The Other Trigonometric Functions	484/6-41, 49-51
5.4	Right Triangle Trigonometry	495/6-41
Chapter 6 Periodic Functions		
6.1	Graphs of the Sine and Cosine Functions	520/6-14, 18,21
6.2	Graphs of the Other Trigonometric Functions	538/19, 22-26
6.3	Inverse Trigonometric Functions	550/8-11, 24, 26, 28
Chapter 7 Trigonometric Identities & Equations		
7.1	Solving Trig. Equations with Identities	568/16-18, 29-33, 40-42
7.2	Sum and Difference Identities	582/4-7, 10-13, 20, 21, 49-51
7.5	Solving Trigonometric Equations	614/4-9, 13-25, 41, 42