**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**](https://openstax.org/details/books/precalculus)**, online or** [**pdf**](https://assets.openstax.org/oscms-prodcms/media/documents/Precalculus-OP_9wwF7YT.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:

1. Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
2. Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
3. Represent quantitative problems expressed in natural language in a suitable mathematical format.
4. Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
5. Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.
6. 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**

[**Chapter 1 Functions**](https://openstax.org/books/precalculus/pages/1-introduction-to-functions)
1.1 Functions and Function Notation
1.2 Domain and Range
1.3 Rates of Change and Behavior of Graphs
1.4 Composition of Functions
1.5 Transformation of Functions
1.6 Absolute Value Functions
1.7 Inverse Functions

[**Chapter 2 Linear Functions**](https://openstax.org/books/precalculus/pages/2-introduction-to-linear-functions)
2.1 Linear Functions
2.2 Graphs of Linear Functions

[**Chapter 3 Polynomial and Rational Functions**](https://openstax.org/books/precalculus/pages/3-introduction-to-polynomial-and-rational-functions)3.2 Quadratic Functions
3.3 Power Functions and Polynomial Functions 3.4 Graphs of Polynomial Functions
3.5 Dividing Polynomials
3.6 Zeros of Polynomial Functions
3.7 Rational Functions

[**Chapter 4 Exponential and Logarithmic Functions**](https://openstax.org/books/precalculus/pages/4-introduction-to-exponential-and-logarithmic-functions)
4.1 Exponential Functions
4.2 Graphs of Exponential Functions
4.3 Logarithmic Functions
4.4 Graphs of Logarithmic Functions
4.5 Logarithmic Properties
4.6 Exponential and Logarithmic Equations

[**Chapter 5 Trigonometric Functions**](https://openstax.org/books/precalculus/pages/5-introduction-to-trigonometric-functions)
5.1 Angles
5.2 Unit Circle: Sine and Cosine Functions
5.3 The Other Trigonometric Functions
5.4 Right Triangle Trigonometry

[**Chapter 6 Periodic Functions**](https://openstax.org/books/precalculus/pages/6-introduction-to-periodic-functions)
6.1 Graphs of the Sine and Cosine Functions
6.2 Graphs of the Other Trigonometric Functions 6.3 Inverse Trigonometric Functions

[**Chapter 7 Trigonometric Identities & Equations**](https://openstax.org/books/precalculus/pages/7-introduction-to-trigonometric-identities-and-equations)
7.1 Solving Trig. Equations with Identities
7.2 Sum and Difference Identities
7.5 Solving Trigonometric Equations

**SUGGESTED EXERCISES (page/exercise #)**

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