Mathematics Department
Brooklyn College, City University of New York

Math 1021 (Precalculus A) Syllabus
3 hours lecture, 1 hour recitation; 2 credits

Math 1021 is the first semester in a two-semester sequence for precalculus. Math 1026 follows Math 1021 and is the second semester in this sequence. Alternatively, students may complete precalculus in one semester in Math 1011.

Prerequisites
- Real Numbers and Their Properties **-** Types of Real Numbers, Operations on Real Numbers, Properties of Real Numbers
- The Real Number Line and Order **-** The Real Line, Order on the Real Line, Sets and Intervals, Absolute Value and Distance
- Integer Exponents **-** Exponential Notation, Rules for Working with Exponents
- Rational Exponents and Radicals **-** Radicals, Rational Exponents, Rationalizing the Denominator
- Algebraic Expressions **-** Adding and Subtracting Polynomials, Multiplying Algebraic Expressions, Special Product Formulas
- Factoring **-** Factoring Trinomials, Special Factoring Formulas, Factoring an Expression Completely
- Rational Expressions **-** Multiplying, Dividing, Adding and Subtracting Rational Expressions, Simplifying Rational Expressions

Equations and Inequalities
- Basic Equations **-** Solving Linear Equations, Solving Power Equations, Solving for one variable in terms of the other
- Quadratic Equations **-** Solving Quadratic Equations by Factoring, Completing the Square, the Quadratic Formula
- Complex Numbers **-** Arithmetic Operations of Complex numbers, Square Roots of Negative Numbers, Complex Solutions of Quadratic Equations
- Absolute Value Equations and Inequalities- Solving an Absolute Value Equation, Properties of Absolute Inequalities

Coordinates and Graphs
- The Coordinate Plane**-** Distance and Midpoint Formulas,
- Graphs of Equations in Two Variables**-** Graphing Equations by plotting point, Intercepts, Circles, Symmetry
- Lines - Slope of a Line, Equations of a line**-** Point-Slope Form, Slope-Intercept Form, Vertical, Horizontal, Parallel, and Perpendicular Lines, General Equation of a Line, Slope as Rate of Change

Functions
- Definition of a Function-- Domain, Range, Graphs of Functions, Getting Information from the Graph of a Function,
- Average rate of Change of a Function,
- Transformations of Functions, Combining Functions -- Sums, Differences, Products, Quotients, Composition of Functions, One-to-One Functions and their Inverses

Polynomial and Rational Functions
- Quadratic Functions--Graphing Quadratic Functions Using the Standard Form, Maximum and Minimum Values of Quadratic Functions,
- Polynomial Functions and Their Graphs-- Dividing Polynomials, Real Zeros of Polynomials, Complex Zeros and the Fundamental Theorem of Algebra,

- Rational Functions and Their Graphs-- Asymptotes, Intercepts, End-behavior

Exponential and Logarithmic Functions
- Exponential Functions**--** The Natural Exponential Function,
- Laws of Logarithms--Exponential and Logarithmic Equations

Systems of Equations and Inequalities
- System of linear Equations in two Variables--Substitution, Elimination, and Graphical Methods,
- Systems of Non-linear Equations-- Substitution, Elimination, and Graphical Methods