Syllabus for MTH 21.5 -- SURVEY OF MATHEMATICS I WITH ALGEBRA (3 credits / 5 hours)

Prerequisite: None. Students with Math Proficiency Index less than 40 are strongly encouraged to enroll in Math Start or CUNY Start before taking college-level mathematics courses.

Textbooks: 1. "Mathematics, A Practical Odyssey" by D. Johnson and T. Mowry, 8th edition
         CENGAGE Learning, 2014
         2. "MTH 5 Lecture Notes" by A. McInerney, available at
    https://fsw01.bcc.cuny.edu/mathdepartment/Courses/Math/MTH05/05text0916b-hyper.pdf
         3. "ARITHMETIC: A Textbook for Math 01" by A. Weaver, available at
    https://fsw01.bcc.cuny.edu/mathdepartment/Courses/Math/MTH01/ArithBook5thEd.pdf

Calculator: Scientific calculator (suggested: TI-36X Pro)

Course Description: This course aims to introduce liberal arts students to the important mathematical concepts of sets, numbers, probability, statistics, and geometry. Students will learn how to analyze quantitative information, and how to make inferences and predictions about events around us. Further topics covered include financial management and linear programming. The following material from elementary algebra has been integrated into the course to provide the necessary background: fractions, decimals, percentages, radicals, functions, polynomials, linear and quadratic equations, literal equations, systems of equations, inequalities in one and two variables. This course is equivalent to MTH 21 Survey of Mathematics I in academic content and for the purpose of grade replacement.

Purpose:. This course covers the full content of MTH 21, Survey of Mathematics I, with supplemental instruction in elementary algebra for students who are not Math Proficient by CUNY standards. This course is not for STEM or Business Administration AS majors and is not a prerequisite for any higher- level mathematics course.

Student Learning Objectives: Upon completion of this course, students will be able to:

1. Perform operations with signed numbers and fractions. Solve and graph linear equations. Solve literal equations. Evaluate algebraic expressions and solve word problems. Evaluate functions and graph linear functions.
2. Use the language of sets (membership, union, intersection and complement) to analyze and solve problems.
3. Sort, analyze and present numerical data using sample spaces and measures of central tendency.
4. Recognize the families of prime, composite and perfect numbers.
5. Predict experimental outcomes using basic techniques of probability (permutations, combinations, counting techniques, tree diagrams).
6. Manage personal finances through a basic understanding of financial instruments such as loans, mortgages, and annuities.
7. Understand the geometric concepts of perimeter and area and recognize fractals.
8. Solve systems of linear equations and linear inequalities in two variables.
9. Optimize a function subject to constraints using the methods of linear programming.

Pathways: This course may be used to satisfy Category B (Mathematical and Quantitative Reasoning) of the CUNY Pathways Required Core.

Grading Guidelines: Homework, quizzes, oral presentations, projects, etc. (1/3 of grade); midterm, in-class tests (1/3 of grade); final exam (1/3 of grade). Additional detailed grading information will be provided by your instructor.

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.

	Mathematics, A Practical Odyssey	ELEMENTARY ALGEBRA
Week 1	2.1 Sets and set operations.	1.1 – 1.8 Review of fractions Review decimals, rounding, percentages See chapters 1 – 4 in textbook 3: ARITHMETIC
Week 2	2.2 Applications of Venn diagrams 2.3 Introduction to Combinatorics	2.1 – 2.6 Signed numbers, exponents, square roots 3.1 Order of operations
Week 3	2.4 Permutations and combinations	3.2 Algebraic expressions 3.3 Evaluating algebraic expressions 3.4 – 3.5 Translating algebraic expressions
Week 4	2.5 Infinite sets	4.1 Algebraic statements and solutions 4.2 Solving linear equations in one variable
Week 5	4.1 Population, sample and data	6.1 Introduction to polynomials 6.2 Adding and subtracting polynomials
Week 6	4.2 Measures of central tendency Supplement: percentiles	6.3 Properties of exponents 8.1 Quadratic equations and number systems
Week 7	7.4 Prime numbers and perfect numbers 7.5 Fibonacci numbers and the golden ratio	8.2 Radical expressions
Week 8	3.1 History of probability 3.2 Basic terms of probability	4.3 Solving literal equations
Week 9	3.3 Basic rules of probability	4.4 – 4.5 Solving linear inequalities in one variable
Week 10	3.4 Combinatorics and probability 5.1 Simple interest	5.1 Solving linear equations in two variables
Week 11	5.2 Compound interest	5.2 Slope and the geometry of lines
Week 12	5.3 Annuities 5.4 Amortized loans	5.3 Solving linear inequalities in two variables
Week 13	8.1 Perimeter and area 8.9 Fractal geometry	5.4 – 5.5 Solving systems of linear equations
Week 14	12.0 – 12.1 Linear programming	