SYLLABUS

MTH 21 – A Mathematical World   (3 credits, meets 3 hours per week)

Prerequisite: Math Placement Index of at least 60.
Textbook: "Mathematics, A Practical Odyssey," by D. Johnson and T. Mowry,
                8th edition Cengage Learning, 2015. ISBN: 9781305104174
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.
Purpose: This course may be used to satisfy Category B/Mathematical and Quantitative Reasoning of CUNY Pathways Required Core. 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: On successful completion of this course, students will be able to

1. Understand the advantages of place-value numeration systems.
2. Use the language of sets (membership, union, intersection and complement) to analyze and solve problems.
3. Predict experimental outcomes using basic techniques of probability (permutations, combinations, counting techniques, tree diagrams).
4. Use linear and quadratic functions to model real-world problems, and understand the significant differences between the two models.
5. Manage personal finances through a basic understanding of financial instruments such as loans, mortgages, and annuities

Suggested Grading: Homework: 15%
                       Class participation: 10%
                       Quizzes or tests: 20%
                       Midterm: 25%
                       Final Exam: 30%
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.

Sets and Counting (3 weeks)	**Homework**
2.1 Sets and set operations	Exercises 1, 7, 9, 17-25 (odd), 29, 41-49 (odd)
2.2 Applications of Venn diagrams	Exercises 1, 3, 5, 27-31 (odd)
2.3 Introduction to Combinatorics	Exercises 1, 5, 15, 17, 23-35 (odd)
2.4 Permutations and Combinations	Exercises 1, 3, 5, 13, 15, 19-37 (odd), 49, 53
2.5 Infinite sets	Exercises 1, 3, 5, 11, 15, 17

Number Systems and Number Theory (1 week)

7.4 Prime numbers and perfect numbers	Exercises 3, 5, 9, 13, 15, 17
7.5 Fibonacci numbers and the Golden Ratio	Exercises 1, 3, 5, 9, 11 (if discussed in class)

Probability (3 weeks)

3.1 History of probability (optional)	Exercises 1-8 (some of these hands-on exercises may be done in class)
3.2 Basic terms of probability	Exercises 1-28 (all)
3.3 Basic rules of probability	Exercises 11-25 (odd), 47-53 (odd)
3.4 Combinatorics and probability	Exercises 1-13 (odd), 21

Statistics (1 week)

4.1 Population, Sample and Data	Exercises 1, 5, 7, 15, 23, 27
4.2 Measures of Central Tendency	Exercises 1, 11, 15, 17, 19, 21
Supplement: Percentiles	

Finance (3 weeks)

5.1 Simple interest	Exercises 5-19 (odd), 37
5.2 Compound interest	Exercises 1-19 (odd), 29, 31, 35
5.3 Annuities	Exercises 1, 3, 5, 9, 19
5.4 Amortized Loans	Exercises 1-9 (odd)

Geometry (1 week)

8.1 Perimeter and Area	Exercises 1-23 (odd)
8.9 Fractal Geometry	Exercises 1, 3, 23, 27, 29

Linear Programming (2 weeks)

12.0 Review of linear inequalities	Exercises 1-19 (odd)
12.1 The geometry of linear programming	Exercises 1-11 (odd)