**BRONX COMMUNITY COLLEGE**

**Of the City University of New York**

**DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE**

# **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)

# RK Fall 2016

EA Fall 2017 incl CLOs

NN, COS Fall 2022
EA Sp23 for COVID – removed 07/23