

BRONX COMMUNITY COLLEGE
Of the City University of New York
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

SYLLABUS for 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

Grading Guidelines: 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.

If you test positive for COVID while taking an in-person/hybrid course:

- Using your BCC email account, please email all your **in-person and/or hybrid** professors of your status.

- Please include your emplid # and current phone number in your email.
- Please also email us at healthservices@bcc.cuny.edu .
- Your professor will work with you to complete class work while you are in quarantine.
- You will be called by a Health Services staffer. It is critical that you connect in a timely matter with this staff member for contact tracing information.
- You will need to submit a negative COVID test to Health Services (healthservices@bcc.cuny.edu) before you are allowed access to the campus.

Your negative test result must come from your doctor or a medical provider (e.g. CityMD, Urgent Care, etc.). We will **not** accept a negative home test result.

Sets and Counting (3 weeks)

- 2.1 Sets and set operations
- 2.2 Applications of Venn diagrams
- 2.3 Introduction to Combinatorics
- 2.4 Permutations and Combinations
- 2.5 Infinite sets

Homework

- Exercises 1, 7, 9, 17-25 (odd), 29, 41-49 (odd)
- Exercises 1, 3, 5, 27-31 (odd)
- Exercises 1, 5, 15, 17, 23-35 (odd)
- Exercises 1, 3, 5, 13, 15, 19-37 (odd), 49, 53
- Exercises 1, 3, 5, 11, 15, 17

Number Systems and Number Theory (1 week)

- 7.4 Prime numbers and perfect numbers
- 7.5 Fibonacci numbers and the Golden Ratio

- Exercises 3, 5, 9, 13, 15, 17
- Exercises 1, 3, 5, 9, 11 (if discussed in class)

Probability (3 weeks)

- 3.1 History of probability (optional)
- 3.2 Basic terms of probability
- 3.3 Basic rules of probability
- 3.4 Combinatorics and probability

- Exercises 1-8 (some of these hands-on exercises may be done in class)
- Exercises 1-28 (all)
- Exercises 11-25 (odd), 47-53 (odd)
- Exercises 1-13 (odd), 21

Statistics (1 week)

- 4.1 Population, Sample and Data
- 4.2 Measures of Central Tendency
- Supplement: Percentiles

- Exercises 1, 5, 7, 15, 23, 27
- Exercises 1, 11, 15, 17, 19, 21

Finance (3 weeks)

- 5.1 Simple interest
- 5.2 Compound interest
- 5.3 Annuities
- 5.4 Amortized Loans

- Exercises 5-19 (odd), 37
- Exercises 1-19 (odd), 29, 31, 35
- Exercises 1, 3, 5, 9, 19
- Exercises 1-9 (odd)

Geometry (1 week)

- 8.1 Perimeter and Area
- 8.9 Fractal Geometry

- Exercises 1-23 (odd)
- Exercises 1, 3, 23, 27, 29

Linear Programming (2 weeks)

- 12.0 Review of linear inequalities
- 12.1 The geometry of linear programming

- Exercises 1-19 (odd)
- Exercises 1-11 (odd)

RK Fall 2016

EA Fall 2017 incl CLOs

NN, COS Fall 2022

EA Sp23 for COVID