

LAGUARDIA COMMUNITY COLLEGE
CITY UNIVERSITY OF NEW YORK
DEPARTMENT OF MATHEMATICS, ENGINEERING AND COMPUTER SCIENCE

MAT107 — MATHEMATICS AND THE MODERN WORLD

3 credits, 3 hours

Prerequisite: CSE099, ENA/ENG/ESA099, MAT096

Catalog Description:

This course introduces selected topics and techniques in mathematics that help solve quantitative problems arising in applications addressed in other fields of study. For each topic studied, the emphasis will be placed first on the mathematical model and then on some significant applications. Inquiry into the applications will motivate problem-solving exercises requiring constructs from areas like algebra, geometry, probability and statistics, computer science, sets and logic.

Purposes and Goals: Upon completion of this course, the student should be able to:

1. Use the four-step problem solving process to analyze non-routine problem situations and identify/test potential solutions.
2. Model quantitative relationships in a situation using algebraic equations or inequalities.
3. Identify the set that results from a series of set operations.
4. Use counting functions to solve counting problems and calculate probabilities.
5. Use inquiry and problem-solving skills to make decisions.
6. Solve network problems requiring a shortest path or minimum spanning tree.
7. Solve simple problems related to personal finance.

Instructional Objectives: The instructor is expected to:

1. Familiarize students with the four-step problem solving process: Inquiry and contextual understanding; modeling and solution planning; solution generation and selection; feasibility and reasonableness testing.
2. Enable students to represent quantitative relationships using algebraic language.
3. Introduce students to sets and set operations.
4. Provide students with the skills to solve counting problems and calculate probabilities.
5. Provide students with the inquiry and problem solving skills to make decisions, even when some quantitative factors are uncertain
6. Introduce Graphs and Networks.
7. Explain investing options and compound and simple interest.

Attendance:

Students are expected to attend all class meetings. Students are also responsible for demonstrating engagement in on-line homework activities. Students are held responsible for all notes, announcements, and materials whether or not they have attended the class. Students should consult the college catalog to

find out the terms and conditions under which a WU, an Incomplete, or an F grade may be given by the instructor.

Textbooks:

Title: Thinking Mathematically (7th edition)

Author: Robert Blitzer

Publisher: Pearson Prentice Hall

Title: Models for Decision-Making, OER, https://academicworks.cuny.edu/lg_oers/61/

Evaluation:

Quizzes, Midterm Exam, 40%

Homework, Projects 30%

Final Examination 30%

Topic(s)	Text Readings
Polya’s Four-Step Process for Problem Solving Quantitative Modeling	Section 1.3 and Handouts
Sets and Set Operations	Chapter 2
Algebraic Models	Sections 6.1 - 6.3, 7.1, 8.1
Network Models	Sections 14.1, 14.2, 14.4
Counting, Probabilities and Expected Values	Sections 11.1 – 11.4, 11.8
Decision Models	OER: “Models for Decision-Making”
Midterm Exam	
Spreadsheets for Modeling and Computation	Handouts
Number Systems, Logic and the Math of Computers	Sections 4.1 - 4.3, 3.1 - 3.4
Personal Finance	Sections 8.2 – 8.5
Simulation	Handouts
Additional Topics	TBD

Final Exam Administered During Final Exam Week

