

**BOROUGH OF MANHATTAN COMMUNITY COLLEGE
THE CITY UNIVERSITY OF NEW YORK**

Department of Mathematics

**Quantitative Reasoning
MAT 160**

**Lecture Hours per Week: 4
Credits: 4**

Description

This course aims to teach students how to think competently about quantitative information. Students learn how to take real world problems, translate them into mathematics, and solve them. Topics include thinking critically, numbers in the real world, financial management, statistical reasoning, probability, and mathematical modeling.

Prerequisites

Students must have passed or have been exempted from MAT 012 or MAT 051, ESL 062 RDG 062, and ENG XXX.

Eligibility

This course satisfies the mathematics requirement for Liberal Arts students. It is recommended for students who do not intend to pursue mathematics, science, or any curriculum requiring the study of Calculus.

Required Text

Using and Understanding Mathematics, A Quantitative Reasoning Approach, Jeffrey Bennett and William Briggs, Pearson Addison Wesley, 7th Edition, 2019

Student Learning Outcomes

1. Interpret graphs, tables, and schematics, and draw inferences from them.
2. Represent mathematical information symbolically, visually, numerically, and verbally.
3. Use arithmetical, algebraic, geometric and statistical methods to solve problems.
4. Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.

Outline of Topics and recommended class hours

Class Hour & Page	Text Section	Topic
2 hours, pages 5-14	1A	Living in the Media Age
4 hours, pages 14 -39	1B, 1C	Propositions and Truth Values, Sets and Venn Diagrams
4 hours, pages 40-66	1D, 1E	Analyzing Arguments, Critical Thinking in Everyday Life
4 hours, pages 122 - 135	3A, 3B	Uses and Abuses of Percentages, Putting

		Numbers in Perspective
2 hours, pages 155 – 188	3C, 3D, 3E	Dealing with uncertainty, Index numbers, How numbers deceive
2 hours, pages 192 – 244	4A, 4B, 4C	Finances, The Power of Compounding, Saving Plans and Investments
2 hours, pages 244 – 274	4D, 4E	Loan Payments, Credit Cards, and Mortgages, Income Taxes
1 hour, pages 275 – 289	4F	Understanding the Federal Budget
2 hours, pages 294 – 319	5A, 5B	Fundamentals of Statistics, Should You Believe a Statistical Study?
2 hours, pages 319 – 354	5C, 5D	Statistical Tables and Graphs, Graphics in the Media
1 hour, pages 354 – 368	5E	Correlation and Causality
4 hours, pages 426 – 453	7A, 7B	Fundamentals of Probability, Combining Probabilities
2 hours, pages 453 – 473	7C, 7D	The Law of Large Numbers, Assessing Risk
2 hours, pages 474 – 486	7E	Counting and Probability
4 hours, pages 536 – 559	9A, 9B	Functions: The building blocks of Mathematical Models, Linear Modeling
4 hours, pages 578 – 593 , pages 593 – 608	10A, 10C	Fundamentals of Geometry, Fractal Geometry
OPTIONAL TOPICS		
4 hours, pages 657 – 701	12A – 12C	Voting, Theory of Voting, Apportionment
4 hours, pages 623 – 655	11A – 11C	Mathematics and the Arts, Music, Perspective and Symmetry, the Golden Ratio
4 hours, supplementary handouts		Network Analysis, The Traveling Salesman Problem, Scheduling Problems