

BOROUGH OF MANHATTAN COMMUNITY COLLEGE

City University of New York

Department of Mathematics**Mathematics Literacy – Quantway I****Class hours: 4****MAT 041****Semester:****Credits: 0****Instructor Information:****Name:****Email:****Phone:****Office:****Course Description:**

This developmental course provides an alternative and accelerated pathway to the college level liberal arts mathematics courses. The course will focus on applications of numerical reasoning to make sense of the world around us. Applications of arithmetic, proportional reasoning and algebra are emphasized. This course **cannot** be used as a pre-requisite for MAT056 and is not suited for Science, Technology, Engineering or Math (STEM) students.

Pre/Co-Requisites:

Pre-Requisite: ESL 062 & ACR 094

Students must have passed MAT 8 or been exempt by score on college placement test.

Student Learning Outcomes and Assessment:

I. Quantitative Reasoning Learning Outcomes	Measurements
1. Students will demonstrate quantitative reasoning to analyze problems, critique arguments, and draw and justify conclusions using the following skills and concepts: Q.1 Performing arithmetic operations Q.2 Using proportional reasoning, geometric concepts of area and volume, statistical and probabilistic reasoning Q.3 Understanding how quantities change including, but not limited to multiplicative vs. additive and relative vs. absolute Q.4 Estimating both in terms of mathematical calculations, and in contexts where estimation of values is essential because exact measures are unknown Q.5 Making comparisons based on relative magnitude Q.6 Understanding the magnitude and representations of numbers Q.7 Understanding and using concepts of measurement: units, precision, accuracy, error Q.8 Creating and using models (tables, words, graphs and equations) of real world situations Q.9 Checking answers and determining the reasonableness of results Q.11 Reading and interpreting quantitative information from a variety of real-world sources Q.12 Knowing where to find relevant data and how to evaluate its appropriateness for purpose and validity of source Q.13 Organizing and translating between and among various representations of quantitative information Q.14 Analyzing and using quantitative information to support an argument Q.15 Recognizing, making and evaluating quantitative assumptions	1. Homework, class activities, exams/quizzes, final exam
2. Students will communicate quantitative results in writing and orally using appropriate language, symbolism, data and graphs.	2. Homework, class activities, exams/quizzes, final exam
3. Students will use technology appropriately as a tool, including using computers and the internet to gather, research and analyze quantitative information, using spreadsheets, data simulations and other appropriate technology, and knowing when and how to use calculators appropriately.	3. Homework, class activities, exams/quizzes, final exam
4. Students will exhibit confidence in quantitative reasoning through perseverance and ability to	4. Homework,

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transfer prior knowledge in unfamiliar contexts	class activities, exams/quizzes, final exam
II. Mathematics Learning Outcomes	Measurements
<p>1. Numeracy: Students will develop and apply the concepts of numeracy to investigate and describe quantitative relationships and solve problems in a variety of contexts. Therefore, students will be able to:</p> <p>N.1 Demonstrate operation sense and communicate verbally and symbolically the effects of common operations on numbers.</p> <p>N.2 Demonstrate an understanding of and competency in using magnitude in the context of place values, fractions, and numbers written in scientific notation.</p> <p>N.3 Use estimation skills, knowing how and when to estimate results and to what precision, to solve problems, detect errors, and check accuracy.</p> <p>N.4 Apply quantitative reasoning to perform calculations in applications involving quantities or rates.</p> <p>N.5 Demonstrate measurement sense.</p> <p>N.6 Demonstrate an understanding of the mathematical properties and uses of different types of mathematical summaries of data (e.g., measures of central tendency) and mathematical models.</p> <p>N.7 Read, interpret, and make decisions based on data from graphical displays (e.g., line graphs, bar graphs, scatterplots, histograms).</p>	1. Homework, class activities, exams/quizzes, final exam
<p>2. Proportional Reasoning: Students will represent proportional relationships and solve problems that require an understanding of ratios, rates, proportions, and scaling. Therefore, students will be able to:</p> <p>P.1 Recognize proportional relationships from verbal and numeric representations.</p> <p>P.2 Compare proportional relationships represented in different ways.</p> <p>P.3 Apply quantitative reasoning strategies to solve real-world problems with proportional relationships based on an understanding that derived quantities can be described with whole numbers, fractions, or decimals, or in a combination of these, and that to fully explain these relationships, units must be used.</p>	2. Homework, class activities, exams/quizzes, final exam
<p>3. Algebraic Reasoning: Students will reason using the language and structure of algebra to investigate, represent, and solve problems. Therefore, students will be able to:</p> <p>A.1 Understand various uses of variables to represent quantities or attributes.</p> <p>A.2 Describe the effect that a change in the value of one variable has on the value(s) of other variables in the algebraic relationship.</p> <p>A.3 Construct and use equations or inequalities to represent relationships involving one or more unknown or variable quantities to solve problems.</p>	3. Homework, class activities, exams/quizzes, final exam
<p>4. Functions: Students will represent relationships between quantities in multiple ways and solve problems that require an understanding of functions. Therefore, students will be able to:</p> <p>F.1 Translate problems from a variety of contexts into a mathematical representation and vice versa.</p> <p>F.2 Describe the behavior of common types of functions using words, algebraic symbols, graphs, and tables.</p> <p>F.3 Identify when a linear model or trend is reasonable for given data; when a linear model does not appear to be reasonable, know how to explore the applicability of other models.</p> <p>F.4 Identify important characteristics of functions in various representations.</p> <p>F.5 Use appropriate terms and units to describe rate of change.</p> <p>F.6 Understand that abstract mathematical models used to characterize real-world scenarios or physical relationships are not always exact and may be subject to error from many sources, including variability.</p>	4. Homework, projects, class activities, exams/quizzes, final exam

Required Text and Readings:

Mathematics Literacy, BMCC Edition 1.0. This curriculum materials was re-designed by BMCC QW Committee from The Carnegie Foundation & The Charles A. Dana Center's Quantway I, V. 1.0.

Evaluation and Requirements of Students:

The final grade in this course will be a passing grade of S, or a failing grade of R. To pass the course, the student must attain a cumulative score of 70 % or more **AND** receive 60% or higher on the comprehensive final examination.

Grade Distribution:

Out of Class Experiences:	30%	Module Exams:	35%
Class Participation:	15%	Final Exam:	20%

Student Services:

1. Math Lab

The Math Lab is located in S535. You will need a valid BMCC student ID to visit the Math Lab. Tutors are available in the Math Lab for free to all BMCC students. The Math Lab has worksheets with practice problems in stock, as well as computer- and video-based tutoring.

2. Learning Resource Center (LRC)

To help make your college career a success, the Learning Resource Center (LRC) offers students academic support services to strengthen academic skills and meet their learning needs. LRC offers tutorial and instructional computer lab services and course-specific, non-print supplemental instructional materials. The LRC is located in room S-500 and all services are available free of charge to registered BMCC students. For more info visit <http://www.bmcc.cuny.edu/lrc/>

3. E-Tutoring

E-tutoring is available to all BMCC students. If you e-mail your question, you will receive response within 24 hours Monday to Friday except when classes are not in session. Questions submitted over the weekend, if not answered within 24 hours, will be answered on the following Monday. For further information, please call e-tutoring at 212-220-1380, send an email to e-tutoring@bmcc.cuny.edu or visit <http://www.bmcc.cuny.edu/etutoring/>

College Attendance Policy:

1. Absences

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For this course, you are allowed five hours of absence (not seven days). In the case of excessive absence, the instructor has the option to lower the grade or assign an "F", "R", or "WU" grade.

2. Class Attendance

If you do not attend class at least once in the first three weeks of the course and once in the fourth or fifth weeks, the Office of the Registrar is required to assign a grade of "WU". Attendance in both regular and remedial courses is mandated by policy of the City University of New York. Instructors are required by New York State law to keep an official record of class attendance.

3. Lateness

Classes begin promptly at the times indicated in the Schedule of Classes. Arrival in classes after the scheduled starting time constitutes a lateness. Latecomers may, at the discretion of the instructor, incur an official absence.

Academic Adjustments for Students with Disabilities:

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities. BMCC is committed to providing equal access to all programs and curricula to all students.

BMCC Policy on Plagiarism and Academic Integrity Statement:

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own

creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's web site, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).

MAT041 Outline of Topics

Weeks	Topics Covered	Lesson #
Week 1	Introduction to Quantitative Reasoning What is Percent?	1.1 1.2
Week 2	Affordable Care Act, Whose Footprint Is Bigger?	1.3 1.4
Week 3	Interpreting Statements About Percentages Module 1 Review	1.5
Week 4	Module 1 Assessment How Crowded Are We?	Exam 1 2.1
Week 5	Counting our votes, Measuring Population Change	2.2 2.3
Week 6	Picturing Data with Graphics What Is Average?	2.4 2.5
Week 7	What Is the Chances? Module 2 Review	2.6
Week 8	Module 2 Assessment What is the Correct Dose?	Exam 2 3.1
Week 9	The Facts on the Ground The Fixer Upper	3.2 3.3
Week 10	Balancing Blood Alcohol A Return to Proportional Reasoning	3.4 3.5
Week 11	Module 3 Review Module 3 Assessment	Exam 3
Week 12	Modeling Money More Linear Modeling	4.1 4.2
Week 13	Compounding Interest Makes Cents Compounding Makes More Cents,	4.3 4.4
Week 14	The Rising Seas Module 4 Review	4.5
Week 15	Module 4 Assessment Final Assessment Review	Exam 4
Week 16	Final Exam	Final