Title of Course:_FUNDAMENTALS OF MATHEMATICS I   **Class Hours: 3**

MAT110   **Semester**_____

Instructor Information (Phone#, Office#, email)_____

Credits 3

Course Description This course includes the study of several mathematical systems. The role of mathematics in modern culture, the role of postulational thinking in all mathematics, and the scientific method are discussed. The course considers topics such as the nature of axiom, truth and validity; the concept of number; the concept of set; scales of notation, and groups and fields.

Prerequisites Students must have taken (or been exempt from) MAT 008, MAT012, MAT041 and MAT 051.
MAT 110 is a course for Liberal Arts students not majoring in mathematics, science, or any curriculum requiring the study of Calculus and is equivalent to MAT 100.

Course Student Learning Outcomes (Students will be able to…)	Measurements (means of assessment for student learning outcomes listed in first column)	
1. Students will be able to interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.	1. Quizzes, homework, tests, projects.	
2. Students will be able to use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems	2. Quizzes, homework, tests, projects.	
3. Students will be able to represent quantitative problems expressed in natural language in a suitable mathematical format.	3. Quizzes, homework, tests, projects.	
4. Students will be able to effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.	4. Quizzes, homework, tests, projects.	
5. Students will be able to evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.	5. Quizzes, homework, tests, projects.	
6. Students will be able to apply mathematical methods to problems in other fields of study.	6. Quizzes, homework, tests, projects.	

Below are the college's general education learning outcomes, the outcomes that are checked in the left-hand column indicate goals that will be covered and assessed in this course. (Check at least one.)

General Education Learning Outcomes	Measurements (means of assessment for general education goals listed in first column)

Communication Skills- Students will be able to write, read, listen and speak critically and effectively.	
Quantitative Reasoning- Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.	Problems measuring quantitative reasoning will be included in the final exam.
Scientific Reasoning- Students will be able to apply the concepts and methods of the natural sciences.	
Social and Behavioral Sciences- Students will be able to apply the concepts and methods of the social sciences.	
Arts & Humanities- Students will be able to develop knowledge and understanding of the arts and literature through critiques of works of art, music, theatre or literature.	
Information & Technology Literacy- Students will be able to collect, evaluate and interpret information and effectively use information technologies.	
Values- Students will be able to make informed choices based on an understanding of personal values, human diversity, multicultural awareness and social responsibility.	

Required Text *Mathematical Ideas*, Custom Edition for Borough of Manhattan Community College (taken from *Mathematical Ideas*, 11th and 12th editions), Miller, Heeren and Hornsby; Pearson Learning Solutions; 2008 2012.

Evaluation and Requirements of Students

Mandatory Topics (these topics are to be covered in all classes):

- **Problem-solving:** Inductive and deductive reasoning, number patterns, problem-solving strategies, calculating, estimating and reading graphs. **Sections 1.1-1.4, suggested number of hours: 7-10 hours, pages 1-42.**
- **Sets:** Symbols and terminology, Venn diagrams, subsets, set operations, Cartesian products, cardinal numbers, and the cardinality of infinite sets. **Sections 2.1-2.4, suggested number of hours: 9-11 hours, pages 43-82.**
- **Logic:** Statements, quantifiers, truth tables, equivalent statements, conditionals, Euler diagrams. **Sections 3.1-3.6, suggested number hours: 9-11 hours, pages 83-136.**
- **Counting by principles**: the systematic counting principle, the fundamental counting principle, permutations and combinations. **Sections 7.1-7.5, suggested number of hours: 10-13 hours, pages 301-352.**

Optional Topics (one of the following will be covered):

- **Group Theory and finite mathematical systems**. **Sections 4.5-4.7, pages 168-194.**
- **Number theory:** Prime and composite numbers, greatest common factor, least common multiple, the Fibonacci sequence, and the Golden Ratio. **Sections 5.1-5.5, pages 197-238.**
- **Mathematics of Finance.** The time value of money, installment buying, truth in lending, home ownership and financial investments. **Sections 8.1-8.5, 16.4, pages 353-414.**
- **History of numerations systems and conversion between bases: 4.1-4.4**
- **Introduction to Real numbers: 6.1-6.5**

College Attendance Policy
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 example, you may be enrolled in a three-hour class. In that class, you would be allowed 4 hours of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

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).