Department of Mathematics

FUNDAMENTAL OF MATHEMATICS I
MAT 100
Semester:

Class hours: 4

Instructor:
Phone:
Office:

Credits: 4

E-mail:

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

Prerequisites and/or Co-requisites
Students must have taken (or been exempt from) MAT 010, MAT011, MAT012, and MAT 051, MAT 100 is an optional course (instead of MAT150 or MAT200) for Liberal Arts students not majoring in mathematics, science, or any curriculum requiring the study of Calculus.

Students Learning Outcomes

1. Students will learn the vocabulary, concepts and symbols of set theory, logic, historical numeration systems, modern number systems and its principles.
2. Students will be able to determine the validity of a logical argument through the use of truth tables Euler diagram and/or syllogisms.
3. Students will be able to determine the cardinality of a set and any of its subsets by way of deductive thought.
4. Students will be able to represent numeral from other places and other times giving a historical perspective of the numeration systems and they will be able to represent numbers in different bases and how to convert them from one base to another giving a modern and future view.

5. Students will be able to think critically about the structure of the real number system including operations and their properties, order and distribution of the rational and irrational numbers on the numerical real line.
6. Students will be able to use simple counting methods, including the Fundamental Counting Principle, permutations and combinations to find the cardinality.

Required Texts and/or Supplementary Materials
Mathematical Ideas, Custom Edition for Borough of Manhattan Community College (taken from *Mathematical Ideas*, 11th edition)*,* Miller, Heeren and Hornsby; Addison Wesley Longman Inc; 2008.

Evaluation and Requirements of Students

At the beginning of the semester, the instructor will advise the student of the determination of the final grade which will be based on class work, examinations, quizzes, writing assignments and the final examination. Students are required to attend all scheduled classes.

The three exams will be held in the first weeks of October, November and December. They will be at least 1 hour long and will consist of 10 questions (multiple choice and essay type).

Outline of Topics   **Text Pages**

Class Hours and Page	Text Section	*Topic*
6 hours Pages 53-97	2.1-2.5	Sets: Symbols and terminology, Venn diagrams, subsets, set Operations, Cartesian Products, Cardinal Numbers, and the Cardinality of infinite sets.
8 hours Pages 101-136	3.1-3.6	Statements, quantifiers, Truth Tables, Equivalent statements, conditionals, circuits and Euler diagrams.
9 hours Pages160–206	4.1-4.5	History of numerations systems, conversion between bases, arithmetic in the Hindi-Arabic-System, finite mathematical systems*, groups*.
9 hours Pages 260-326	6.1-6.5	Introduction to Real numbers, order, absolute value, Real number operations, properties and applications, decimal representation of rational and irrational numbers.
9 hours Pages 609-640	10.1-10.3	Counting by principles: the systematic counting principle, the fundamental counting principle, permutation and combination.

*Denotes Optional Topic

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 four-hour class. In this class, you are allowed 5 <u>hours</u> of absence (not 5 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/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 (Room N769;220-8180). 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 college bulletin(also available online).