

Montgomery County Community College
 MAT 103A
 Foundations of Mathematics
 3-4-1

COURSE DESCRIPTION:

This course is to give the students an understanding of the foundations of math. Topics include sets, logic, number bases and the structure of the number system from naturals to the reals, solving multiple step problems, and teaching to one's peers. This course does not satisfy the MAT 100 prerequisite requirement for MAT 125, MAT 130, MAT 131, MAT 140, or MAT 161. MAT 103A covers the same topics as MAT 103 by meeting 4 hours a week for 3 credits. It is important to note that the students will pay for four hours, but only receive three credits. NOTE: Check with a counselor regarding transfer equivalency.

REQUISITE(S):

Previous Course Requirements

- * MAT 011 Beginning Algebra, or MAT 085 Fundamentals of Mathematics with a minimum grade of "C"

Concurrent Course Requirements

- * None

Non-course Requirements

- * Accepted math placement test scores include a Next-Generation Accuplacer Quantitative Reasoning, Algebra and Statistics Test score of 238-300.

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to	LEARNING ACTIVITIES	EVALUATION METHODS
1. Describe the difference between inductive reasoning and deductive reasoning use both types.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
2. Use the process of estimation to arrive at an approximate solution to a question.	Lectures Small Group Discussions and/or Projects The Use of TI 84 Graphics Calculator Homework Quizzes Projects	Exams Quizzes Homework Projects
3. Discuss Polya's problem solving procedure and use it when solving problems. (Core Goal 2.1, 2.2, 2.3 and 2.4)	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
4. Set Terminology and operations on sets	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
5. Venn diagrams and the use of De Morgan's Law	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
6. Construction and Analyzing Truth Tables mathematical logic such as concepts in logic, symbolic arguments and Euler diagrams	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
7. Contributions of ancient civilizations to our present number system including conversions between Egyptian,Roman, Babylonian,and base ten systems	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
8. Be able to explain the concepts of algorithms and apply the algorithms of Duplation/Mediation and Galley Method to multiplication	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
9. Classify,locate,and compare numbers	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
10. Perform operations of whole numbers, integers, rational numbers, and decimal numbers using the order of operations	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
11. Explain and illustrate number properties closure,commutative, associative,distributive, identity, inverse,and density	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
12. Apply the meaning of terms, factors, divisors, multiples, divisibility tests, prime, composite numbers to prime factorization, greatest common divisor, and least common multiple	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
13. Solve multiple step problems	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects
14. Demonstrate an ability to perform higher level mathematics reasoning beyond computational skills Demonstrate teaching topics to peers	Lectures Small Group Discussions and/or Projects Homework Quizzes Projects	Exams Quizzes Homework Projects

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria*.

SEQUENCE OF TOPICS:

1. Inductive Reasoning, Estimation, Problem Solving
2. Sets, Set Applications
3. Statements and Connectives, Truth Tables, Equivalent Statements, Symbolic Arguments, Euler Diagrams
4. Ancient Numeration Systems, Place Value and Positional Notation, Other Bases, Algorithms, Computation in Other Bases
5. Number Theory, Integers, Rational and Irrational Numbers, Real Number System

LEARNING MATERIALS:

Angel and Porter. (2017). *A Survey of Mathematics with Applications*. Pearson. 10th ed

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by: Marion Graziano

Date: 3/10/2019

VPAA/Provost or designee Compliance Verification:

Date: 3/14/2019

A handwritten signature in cursive script, appearing to read "Marion Graziano".

This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.