



# Department Master Syllabus

**Camden County College**

**Blackwood, New Jersey**

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| **Course Number:**  MTH-105 | | **Course Title:**  Mathematical Systems I: Structures | | | |
| **Department/Program:** Mathematics | | | | | |
| **Date of Review:** April | | 2023 | | | |
| (This Department Master Syllabus has been examined by the program/department faculty members and it is decided that no revision is necessary at this time.) | | | | | |
| **Date of Revision:** April | | | | 2023 | |
| (This Department Master Syllabus has been examined by the program/department faculty members and it is decided a change requiring a revision is necessary at this time.) | | | | | |
| N.B. A change to the course materials alone (textbooks and/or supplementary materials) may not constitute a revision. Any other change to the items listed below on this form is considered a revision and requires approval by the department/program faculty at a department/program meeting and by the division at a Chairs and Coordinator meeting. | | | | | |
| **Credits:** 3 | | | | | |
| **Contact Hours** | **Lecture:** 3 | | **Lab:** 0 | | **Other:** 0 |
| Prerequisites: MTH-029 or MTH-035 and ENG-013 OR proper placement exam scores. | | | | | |
| Co-requisites: None | | | | | |
| Course Description: This course is designed for students majoring in a Liberal Arts area other than Mathematics or the Physical Sciences as well as education majors, with the exception of students intending to become secondary math or science teachers. Topics include problem solving techniques; sets; numeration systems; properties of counting numbers, whole, integers, rational and real numbers; number theory; equations and functions. | | | | | |
| **Student Learning Outcomes (SLOs)**  Course specific student learning outcomes  Upon completion of this course the student will be able to:   1. Use pedagogical methods to show how various concepts would be taught in the elementary school, as assessed by tests, quizzes, homework, or projects. 2. Employ strategies for problem solving, as assessed by tests, quizzes, homework, or projects. 3. Perform basic operations on sets, natural numbers, whole numbers, integers, rationals, reals, decimals, and percents, as assessed by tests, quizzes, homework, or projects. 4. Demonstrate algebraic reasoning and graphing, as assessed by tests, quizzes, homework, or projects.   As assessed by:  tests, quizzes, homework, or projects. | | | | | |

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| **General Education Student Learning Outcomes**  If this course has applied for General Education Elective Status the general education student learning outcomes listed below must exactly match those the sponsor has identified on the General Education Request form.  General Education SLOs:  Students will apply appropriate mathematical and statistical concepts and operations to interpret data and to solve problems, as assessed by tests, quizzes, homework, or projects.  As assessed by:  tests, quizzes, homework, or projects. |
| **Program Learning Outcomes**  List all course level student learning outcomes that interconnect to a particular program learning outcome.  This is a mathematical general education course that can be taken as a requirement in multiple programs.  Describe the assessment of the interconnected program learning outcome(s).  These will be assessed by tests, quizzes, homework, or projects. |
| **Course Outline:** Unit I: Thinking Critically An Introduction to Problem Solving  Polya’s Problem Solving Principles  More Problem Solving Strategies  Algebra as a Problem Solving Strategy  Additional Problem Solving Strategies  Reasoning Mathematically  **Unit II: Sets and Whole Numbers**  Sets and Operations on Sets  Sets, Counting, and Whole Numbers  Addition and Subtraction of Whole Numbers  Multiplication and Division of Whole Numbers  **Unit III: Numeration and Computation**  Numeration Systems Past and Present  Algorithms for Adding and Subtracting Whole Numbers  Algorithm for Multiplication and Division of Whole number  Mental Mathematics and Estimation  Non-decimal Positional Systems  **Unit IV: Number Theory**  Divisibility of Natural Numbers  Test for Divisibility  Greatest Common Divisor and Least Common Multiple  **Unit V:Integers**  Representations of Integers  Addition and Subtraction of Integers  Multiplication and Division of Integers  **Unit VI: Rational Numbers and Fractions**  The Basic concepts of Fractions and Rational Numbers  Addition and Subtraction of Fractions  Multiplication and Division of Fractions  The Rational Number System  **Unit VII: Decimals, Percent’s, and Real Numbers**  Decimals and Real Numbers  Computations with Decimals  Proportional Reasoning  Percent  **Unit VIII: Algebraic Reasoning and Graphing**  Variable, Algebraic Expressions, and Functions |
| **Course Activities:**  The classroom activities will consist of formal and informal lectures, group projects, assignments, and presentations by students at the instructor’s discretion. Students will be encouraged to participate fully and actively in the exploration of new concepts by means of hands-on activities and a problem solving approach. |
| **Course Materials:**  Textbook(s): Mathematical Reasoning for Elementary Teachers, Long and DeTemple, current edition, Pearson  Supplemental Materials: Textbook specific course management system. A basic four function calculator is required.  Software Licenses: N/A  Computers: N/A |
| **Course Assessment Plan**  How often and by what means will the effectiveness of this course as part of the curriculum be assessed?    This course will be assessed in accordance with the Gen Ed assessment cycle. |