Department Master Syllabus
Camden County College
Blackwood, New Jersey

Course Number:	**Course Title:**
MTH-205	Mathematical Systems III: Structures II

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 primarily for elementary and early childhood education majors. The course will require students to investigate problems in order to deepen their conceptual and procedural understanding in the areas of algebra, data analysis, probability, geometry, measurement, and systematic listing and counting. Students in the course will use physical materials and models to explore topics in algebra, geometry, probability, and statistics. They will use mathematics to describe real-world relationships and develop conjectures and intuitive proofs. A TI-108 (or any basic four function calculator) is required.

Student Learning Outcomes (SLOs)

Course specific student learning outcomes
Upon completion of this course the student will be able to:

1. Demonstrate an understanding of mathematical concepts and procedures along with the connections among them, as assessed by tests, quizzes, homework, or projects.
2. Employ ways to reason mathematically, strategies for problem solving, and effectively communicate mathematics at various levels of formality, as assessed by tests, quizzes, homework, or projects.
3. Solve problems with applications to the real world, as assessed by tests, quizzes, homework, or projects.

As assessed by:
tests, quizzes, homework, or projects.

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.

All CSLOs target EDU.AS program learning outcomes 1 and 4. CSLO bullets 2 and 3 target EED.AA program learning outcome 4.

Describe the assessment of the interconnected program learning outcome(s).

To be assessed within the normal assessment cycle.

Course Outline:

Problem Solving (optional) (1 day)

Unit I: Algebra and Applications (4 weeks)

Algebraic Expressions & Formulas
Algebraic Expressions
Formulas and Math Models
Vocabulary of Algebraic Expressions
Simplifying Algebraic Expressions
Linear Equations in One Variable and Proportions
Solve Linear Equations in One Variable
Linear Equations with Fractions
Proportions
Applications of Proportions
Applications of Linear Equations
Problem Solving with Linear Equations
Solve a Formula for One of its Variables
Linear Inequalities in One Variable
Solve linear inequalities and graph the solution set
Graphs & Functions;
Points, ordered pairs, Functions, Graphing Linear Functions,
The vertical line test
Linear Functions & Their Graphs
Graphing using intercepts, slope, slope-intercept form of a line,
Equations of Horizontal and Vertical Lines
Systems of Linear Equations in Two Variables (optional)
Addition Method and Substitution Method
Applications of Algebra: Percent, Sales Tax, and Discounts

Unit II: Measurement and Geometry (7 weeks)
Measurement (Dimensional Analysis)- Conversion in English and Metric
Points, Lines, Planes, and Angles
Points, Lines and Planes
Measuring Angles with Degrees
Parallel Lines
Triangles
The angles of a triangle
Triangles and Their Characteristics
Similar Triangles and Similarity and Scaling of Real Objects
Congruent Triangles
Pythagorean Theorem: problems, intuitive proof, applications
Polygons & Perimeter
Regular Polygons
Types of Quadrilaterals
Perimeter- Development of Formulas for Common Shapes
Sum of the Measure of a Polygon's Angles
Applications
Area & Circumference
Formulas for Area and Circumference-Development of Formulas for Common Shapes
Applications
Volume and Surface Area
Formulas for Volume and Surface Area- Development of Formulas for Common Shapes
Nets, Cross-Sections of 3D Solids, projections, use of dot paper -Applications
Geometric Transformations- (optional)

Unit III: Probability and Statistics (4 weeks)
The Fundamental Counting Principle
Fundamentals of Probability; Theoretical and Empirical Probability
Events Involving Not and Or
Events Involving And; Conditional Probability
Sampling, Frequency Distributions, and Graphs
Populations and Samples
Random Sampling
Frequency Distributions
Histograms and Frequency Polygons
Stem and Leaf Plots
Measures of Central Tendency
Mean, Median, Mode, and Midrange
Measures of Dispersion
Range
Standard Deviation (optional)
Mean Absolute Deviation
The Normal Distribution (optional)
Percentiles and Quartiles
Other types of distributions: skewed left, skewed right
Boxplots, interquartile range, outliers.
Scatter Plots, Correlation, and Regression Lines
Scatter Plots and Correlation
Regression Lines and Correlation Coefficients

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. Students will use geometric solids, geometric 3D solids with cross sections, geometric nets, and dot paper, etc. in the performance of in-class activities.

Course Materials:

Textbook(s): A Problem Solving Approach to Mathematics for Elementary School Teachers Package for Camden County College, Pearson, current edition.

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.