#### APPROVED: 4/12/11

#### Middlesex County College

**Edison, NJ**

**Course Abstract**

*If you need accommodations due to a disability, contact Disability Services in*

*Edison Hall Room 100, 732.906.2546.*

*To foster a productive learning environment, the College requires that all students adhere to the Code of Student Conduct which is published in the college catalog and website.*

**Course ID and Name:** MAT 114, Mathematical Structures II

**Department:**

Maria DeLucia, Ph.D, Chair

Office Location: Center II

E-mail Address: mdelucia@middlesexcc.edu

Telephone: 732.906.2585

**Prerequisites:** Mathematical Structures I **Co-requisites:**

**Course Description:**

This is the second of a two semester sequence. This second course focuses on selected topics from geometry, measurement, data analysis, statistics, and probability. Designed to develop mathematical reasoning, problem solving, and communication of mathematics effectively at different levels of formality, using a variety of representations of mathematical concepts and procedures. Develop a fundamental understanding relating to algebraic thinking and reasoning. Physical materials and models will be used to explore fundamental concepts of geometry, measurement, data analysis, statistics, and probability. This course is especially appropriate for those students preparing to be elementary, early childhood, or special education teachers.

**General Education Status:** Yes

**Credits:** 3  **Lecture Hours:** 3  **Lab Hours:** 0

**Learning Outcomes:**

* Recognize processes and algorithms, and the underlying purposes found in the elementary mathematics topics.
* Demonstrate the ability to communicate mathematical ideas appropriately using the language of mathematics.
* Demonstrate the ability to do algebraic thinking.
* Solve various types of mathematical problems using appropriate strategies.
* Establish the relationship of mathematics to other subjects, its applications in society, and relationships within mathematics itself.
* Develop an appreciation of the history, structure, and application of mathematics.

**Course Content Areas:**

* + - Data Analysis and Statistics
      * Representing and Interpreting Data: understanding the kinds of questions that can be addressed by data, creating data sets, displaying data.
      * Describing data: shape, spread, and center, using different forms of representation, comparing two sets of data.
      * Drawing conclusions: choosing among representations and summary statistics to communicate conclusions, understanding variability, understanding some of the difficulties that arise in sampling and inference.
* Probability
  + Making judgments under conditions of uncertainty, measuring likelihood, becoming familiar with the idea of randomness.
  + Principles of counting, empirical and theoretical probability, simulations.

## Geometry

## Visualization skills: becoming familiar with projections, cross-sections, and decompositions of common two- and three-dimensional figures; representing three-dimensional objects in two dimensions and constructing three-dimensional objects from two-dimensional representations.

## Basic shapes, their properties, and relationships among them: developing an understanding of lines and angles, transformations, symmetry, tessellations, congruence, and similarity.

## Measurement

* + The process of measurement: understanding the idea of a unit and the need to select a unit appropriate to the attribute being measure, understanding that measurements are approximate and that different units affect precision, being able to compare units and convert measurements from one unit to another.
  + Length, area, and volume: deriving measurement formulas for basic shapes; understanding the independence of area and perimeter, surface area and volume.