

MIDDLESEX COUNTY COLLEGE
EDISON, NJ
MASTER SYLLABUS

Course ID and Name: MAT 102, A Survey of Mathematics

Department: Mathematics

Prerequisites: Appropriate score on the College Placement test or MAT 013, or departmental approval

Co-requisites: None

Course Description: This course is primarily for liberal arts students interested in the practical applications of mathematics. Topics surveyed include problem solving and data analysis, mathematical modeling, the use of Venn diagramming, graph theory, voting theory, geometric analysis, set theory, and inductive reasoning.

General Education Status: GE MST

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

Textbook(s) and Other Course Materials:

E-book:

Author: Karl Smith

Title: The Nature of Mathematics, **13th Ed.**

Publisher: Cengage

Software: WebAssign

Core Learning Outcomes:

Upon successful completion of the course, the student will be able to:

1. Use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.
 - a. Translate quantifiable problems into mathematical terms and solve these problems using mathematical or statistical operations.
 - b. Construct graphs and charts, interpret them, and draw appropriate conclusions.
2. Communicate accurate mathematical terminology and notation to explain strategies to solve problems and interpret solutions.
3. Utilize various reasoning, problem-solving, and critical thinking techniques to solve applications, such as mathematical modeling, discrete mathematics, and voting.

4. Understand the language and concepts of logic, sets, voting, statistics, and graph theory, as well as the formal mathematical definitions that accompany them.

Content Strand	Students will be able to...
Inductive Reasoning (CLO 1a, 2, 3, 4)	<ul style="list-style-type: none"> ▪ Demonstrate the ability to identify and construct logical, valid arguments.
Set Theory (CLO 1a, 1b, 2, 3, 4)	<ul style="list-style-type: none"> ▪ Build, analyze, and work with different sets, both finite and infinite, and show understanding of them pictorially with Venn Diagrams.
Mathematical Modeling from Real-World Data (CLO 1a, 1b, 2, 3, 4)	<ul style="list-style-type: none"> ▪ Apply problem solving skills to solve real-world problems.
Graphs, Paths and Circuits (CLO 1a, 1b, 2, 3, 4)	<ul style="list-style-type: none"> ▪ Apply problem solving skills to solve real-world problems in graph theory.
Combinatorics (CLO 1a, 2, 3, 4)	<ul style="list-style-type: none"> ▪ Apply problem solving skills to solve real-world problems in combinatorics.
Voting Methods (CLO 1a, 2, 3, 4)	<ul style="list-style-type: none"> ▪ Understand and determine winners using the different voting methods, analyzing the levels of fairness of such methods.