**Course number and name:** MA 17500  Introductory Discrete Mathematics

**Credits and contact hours:** 3.0 Credits; 3.0 Lectures

**Instructor's or course coordinator's name:** Marc Lipman and Peter Dragnev

**Text book, title, author, and year**

**Course Description**
Sets, logical inference, induction, recursion, counting principles, binary relations, vectors and matrices, graphs, algorithm analysis.
Prerequisites or co-requisites: MA 16500 or 15300 and CS 16000; or MA 15300 and EET 26400 with a grade of C- or better in each course.
Whether a required, elective, or selected elective course in the program: Required

**Course Goals:**

**Course Objectives**
Students will acquire understanding of the important mathematical ideas in the course topics;
Students will improve problem solving skills through extensive practice;
Students will improve critical thinking and acquire new critical thinking tools;
Students will learn to speak and write mathematical language.

The course objectives will be addressed by placing emphasis on:

- **Logical arguments:** how to read and construct logically valid arguments;
- **Rigor:** developing the ability to carefully parse a mathematical argument, including your own;
- **Proofs:** examining types of proofs and proof techniques, learning how to read them, follow their reasoning, and determine their correctness;
- **Writing proofs:** constructing arguments and writing them down. (Proofs are written in English, and must be clear enough and straightforward enough to allow the reader to understand the argument from hypothesis through conclusion. This is only achieved through practice.)
Student Outcomes
The course learning outcomes of MA 17500 supports outcomes \{a, e, k\} of the Computer Engineering Program Students Outcomes (a-k):

a. an ability to apply knowledge of mathematics, science, and engineering
e. an ability to identify, formulate, and solve computer engineering problems
k. an ability to use the techniques, skills, and modern tools necessary for computer engineering practice

Major Topics Covered in the Course
The course covers portion of chapters 2 through 10 of the text, and includes brief skirmishes with
   Proofs, proof techniques, proof writing
   Logic
   Elementary number theory
   Mathematical induction
   Set theory
   Functions and relations
   Counting, Graph Theory.