

TOURO COLLEGE
COMPUTER SCIENCE DEPARTMENT

Course Number: MCO 241
Course Name: MATH for COMPUTER SCIENCE MAJORS
Prerequisite: GSM 130/132
Credits Hours: 3
Developer: Instructor, Dr. Leonid Srubshchik

COURSE DESCRIPTION:

This course provides an introduction to discrete mathematics, i.e. certain mathematical topics related to the computer and information sciences. The binary number system, computer codes and computer arithmetic, set and relations, Boolean algebra and logic circuits, graph theory and finite automata, vectors, matrix and linear systems will be covered.

COURSE OBJECTIVES:

- Learn How number systems work
- Understand Computer Arithmetic and Computer Codes
- Learn and use the ideas in Formal Logic
- Learn Sets and Relations
- Learn elements of Boolean Algebra and Computer Logic
- Describe and use Vectors, Matrices, and Subscripted Variables
- Learn Gaussian Elimination Method for System of Linear Equations
- Learn elements of Combinatorial Analysis
- Understand Graphs, Rooted Trees, and Directed Graphs
- Understand Turing Machines and Finite Automata

ENTRANCE COMPETENCIES

In order to be successful in this course, the student is expected to:

- a. Have knowledge of Elementary Algebra and Pre-Calculus
- b. Try reading with pencil and paper at hand
- c. Analyze the examples and practice problems
- d. Be ready to learn many new terms and ideas
- e. Be sure to understand all the terminology used in the problems, play with some ideas, solve a lot of problems and exercises
- f. Be perseverance

EXIT COMPETENCIES

Upon completion student will be introduced to many computer sciences and the power of mathematical notations. He will develop logical thinking, understand the usefulness of abstractions and demonstrate knowledge of the basic concepts in computer mathematics and use them for solving problems.

COURSE REQUIREMENTS

Class Exercises
In-class Exams 1 and 2 during semester
Homework Assignments
Final Test

Students must complete homework assignments
Students must take all in-class exams and final test

COURSE TEXT(S):

Title: **SCHAUM'S OUTLINE of THEORY and PROBLEMS of
ESSENTIAL COMPUTER MATHEMATICS.**

Author: **SEYMOUR LIPSCHUTZ**

Publisher: **McGraw HILL**

ISBN #: **0-07-037990-4**

BIBLIOGRAPHY: MATHEMATICAL STRUCTURES for COMPUTER SCIENCE

Forth Edition

Author: **JUDITH L. GERSTING**

Publisher: **W.H. FREEMAN and COMPANY 41 Madison Avenue, New York,
NY 10010 ISBN 0-7167-8306-1**

Instructor Resource

Material:

METHODOLOGY: We use sections 8.2 and 8.3 (pp 558-605) from **GERSTING's** book to cover the topic 14. Turing Machines as Function Computers, Church-Turing Thesis.

LESSON SCHEDULE: WEEKLY BREAKDOWN

Lesson	Topic
1.	Binary Number System, Binary Operations and Complements
2.	Computer Codes. Zoned Decimal and Packed Decimal Formats
3.	Computer Arithmetic
4.	Logic, Truth Tables
5.	Logical Equivalence, Arguments, Logical Implementation
6.	Set and Relations
7.	Exam 1: Weeks 1-5, Boolean Algebra, Duality, Basic Theorems
8.	Boolean Expressions, Logic Gates
9.	Simplification of Logic Circuits
10.	Vector, Matrices, Subscripted Variables, System of linear Equations
11.	Combinatorial Analysis. Exam 2: Weeks 6-11
12.	Graphs and Trees.
13.	Finite State Machines, Finite Automata
14.	Turing Machines as Function Computers, Church-Turing Thesis
15.	Review for Final and Final Examination

HOMEWORK ASSIGNMENTS:

Students should complete all the exercises in every chapter covered each week. Students should submit 2 Assignments on time.

ATTENDANCE

All students are expected to maintain good attendance during the course.

GRADING VALUES:

Semester Exams	33%
Final	40%
Class Participation	10%
Homework and Assignments	17%