SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
SYLLABUS (Tentative)
MATH 210-001 (Lee May's section) Introduction to Discrete Mathematics

Objectives: To introduce basic techniques of proof and reasoning, in particular, those for solving discrete problems. To enhance modes of thinking essential to mathematics. To teach techniques widely used in computer science, operations research, and statistics.
Intended for: Students interested in enhancing their reasoning and problem-solving skills. (Required for Mathematics and Computer Science Majors)
Prerequisite: MATH 140 or its equivalent.
Text: None. Notes will be distributed by Dr. May.

Topic	*Class-Periods*
Sets Principles of Set Equality and Specification; unions, intersections, and differences; Venn Diagrams, truth-tables, and element-chasing; power sets.	12
Relations Cartesian Products; reflexivity, irreflexivity, symmetry, anti-symmetry, and transitivity; order relations and Hasse Diagrams; equivalence relations and partitions.	10
Functions Relations and functions; domain and codomain; composition of functions; functions and computer programs; injections, surjections, and bijections; inverse functions.	8
Induction and Recursion The Principles of Mathematical Induction and Strong Induction; the factorial function.	6
Counting How many license plates can be issued in Maryland? The Fundamental Principle of Counting; counting samples – ordered ones with and without replacement, unordered ones with and without replacement.	8
Graphs Network and transportation problems; graphs and cycles; adjacency matrices; the Königsberg Bridge Problem and Euler Cycles; trees and spanning trees; the Spanning-Tree and Greedy algorithms; minimal trees, shortest paths, Prim's and Dijkstra's algorithms; binary trees and search algorithms; planar graphs.	8
A Brief Look at Propositional Calculus and Boolean Algebra Definitions and properties; digital logic gates and Karnaugh Maps.	4
	56

EVALUATION
Presentations in Class and Homework 30-100%
Midterm and Final Exams 0-70%

This course complies with the University Policy on Writing Across the Curriculum. The ability to communicate mathematics effectively, both orally and in writing, is very important. The assignments in this course are designed to help students develop and enhance that ability.

NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO OR PREREQUISITE FOR IT.

ELM 8/2009