

## Salisbury University Department of Mathematical Sciences

MATH 210 : Introduction to Discrete Mathematics  
Syllabus (Tentative)

**Description:** Introduction to basic techniques and modes of reasoning for discrete problem solving. Set theory, recurrence relations, counting, graphs and lattice number theory. 4 Hours Credit: Meets four hours per week. Meets General Education IVB or IVC.

**Prerequisites:** C or better in MATH 140 or equivalent.

**Intended Audience:** Students interested in enhancing their reasoning and problem-solving skills. (Required for Mathematics and Computer Science Majors)

**Objective:** 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.

**Textbooks:** *Discrete Mathematics: A Brief Introduction*, by Kathleen M. Shannon; 2018 in WebAssign (available in hard copy for those who would like a permanent hard copy in addition to the e-textbook, through Salisbury University's Bookstore). WebAssign is required for this course.

Topic	Weeks
<b>Chapter 0: What is Discrete Mathematics? (with examples)</b> Discrete vs. Continuous, Königsburg problem, party problem.	0.5
<b>Chapter 1: Preliminaries I: Sets</b> Sets, subsets, set operations, truth tables, functions and relations, equivalence relations, modular arithmetic, partial orderings, and Hasse Diagrams.	3
<b>Chapter 2: Preliminaries II: Logic and Proof</b> Introduction to proof, mathematical induction, strong induction, universal and existential quantifiers.	2
<b>Chapter 3: Counting</b> Multiplication rule, ordered samples with and without repetition, unordered samples with and without repetition, principle of inclusion and exclusion. Party problem; recurrence relations; unordered samples with repetition; planar graphs and isomorphisms, using k-maps to simplify boolean expressions and circuits.	3.5
<b>Chapter 4: Trees and Other Graphs</b> Graphs, multigraphs, networks, cycles, trees and spanning trees, greedy algorithms, and binary trees.	2
<b>Chapter 5: Propositional Calculus, Boolean Algebra and Digital Logic Gates</b> Set theory, propositional calculus, Boolean algebra, digital logic gates.	2
<b>Tests</b>	1
<b>Total</b>	<b>14</b>

#### Evaluation

Homework, Quizzes, and Class Participation	30 – 40%
Tests and Final Exam	60 – 70%

- Free tutoring is available for this course in the Spring and Fall semesters.
- Clear descriptions of thought processes, evidence of critical thinking, and effective communication must be demonstrated in written work.

- **Writing Across the Curriculum:** Students will be expected to communicate mathematics and mathematical ideas effectively in speech and writing. At the University Writing Center, trained consultants are ready to help you at any stage of the writing process. In addition to the important writing instruction that occurs in the classroom and during professors' office hours, the Center offers another site for learning about writing. **All students are encouraged to make use of these important services.**
- **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 it or is a prerequisite for it.