
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, logic and proof, counting, graph theory, orderings, propositional calculus, and Boolean algebra. 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 statistics, data science, and computer science.

Textbooks: *Discrete Mathematics: A Brief Introduction*, by Kathleen M. Shannon, 2nd edition; 2024 in WebAssign (also available in hard copy for those who would like a permanent hard copy in addition to the e-textbook, through Salisbury University's Bookstore, or as a pdf from your instructor). WebAssign is required for this course.

Topic	Weeks
Chapter 0: What is Discrete Mathematics? Introduction to Set Theory Discrete vs. Continuous, Königsburg problem, sets, subsets, set operations, set equality.	2.0
Chapter 1: Functions and Relations Functions and relations, equivalence relations, modular arithmetic, partial orderings, and Hasse Diagrams.	1.5
Chapter 2: Logic and Proof Introduction to proof, mathematical induction, strong induction, universal and existential quantifiers. (Optional Topic: Recurrence relations.)	2.0
Chapter 3: Counting Multiplication rule, ordered samples with and without repetition, principle of inclusion and exclusion. Party problem; unordered samples with repetition; planar graphs and isomorphisms.	3.5
Chapter 4: Trees and Other Graphs Graphs, multigraphs, networks, cycles, trees and spanning trees, greedy algorithms, and binary trees.	2
Chapter 5: Propositional Calculus, Boolean Algebra and Digital Logic Gates Set theory, propositional calculus, Boolean algebra, digital logic gates, using k-maps to simplify boolean expressions and circuits.	2
Tests	1
Total	14

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.