

Course Code: MAT 200 (IAI M1 905, CS 915)

Course Title: Introduction to Discrete Mathematics

Department: Mathematics

Effective Date: Summer 2026

PCS Code: 1.1 - Baccalaureate/Transfer

CIP Code: 27.0101

Repeatability: 0

Credit Hours

Catalog Notation: 3-0-3

Credit Hour Distribution:

Lecture: 3

Lab: 0

Clinical: 0

Total: 3

General Course Information

Catalog Description

Introduction to discrete mathematics, sets, functions, logic, proofs, Boolean algebra, combinatorics, probability, recurrence relations, trees, and graph theory.

General Course Objectives

Students will learn the important concepts and techniques in discrete mathematical structures which are particularly relevant to computer science.

Minimum Placement Levels

English	Reading	Math
None	None	Credit in MAT 124 with a grade of C or higher, or placement

Prerequisites

None

Methods of Evaluation

3 exams, 4-8 quizzes, homework, and a cumulative final exam.

Instructional Materials and Additional Supplies

Discrete Mathematics and Its Applications, 8th edition; Kenneth Rosen. 978-1-259-67651-2

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Logic, Sets, and Functions	1. Use logical propositions, sets, and functions.	5	0	0
Algorithms, Integers, and Matrices	1. Define and apply the basic concepts of algorithms, complexity, and growth of functions. 2. Define and apply integer division, modular arithmetic, and matrices.	5	0	0
Mathematical Reasoning	1. Form simple proofs. 2. Identify the steps in a proof by induction. 3. Use sequences.	5	0	0
Counting	1. Use permutations, combinations, multiplication rule, and addition rule. 2. Apply binomial coefficients.	5	0	0
Discrete Probability	1. Use basic probability theory, expected value, and variance.	2	0	0
Advanced Counting	1. Identify a recurrence relation. 2. Generate a recurrence relation based on a divide and conquer algorithm. 3. Solve linear recurrence relations.	2	0	0
Relations	1. Define and identify relations, reflexive relations, symmetric relations, transitive relations, and antisymmetric relations. 2. Represent relations using matrices and graphs.	2	0	0
Graphs	1. Define and apply simple, directed multi- and pseudographs. 2. Determine if graphs are isomorphic, connected, or contain Euler paths.	5	0	0
Trees	1. Identify trees. 2. Traverse trees. 3. Use spanning trees. 4. Sort using trees.	4	0	0
Boolean Algebra	1. Identify Boolean operators. 2. Represent logical gates. 3. Minimize circuits using algorithms.	3	0	0
Review and Tests	1. Earn at least 70 percent on each of three hour exams and the cumulative final exam.	7	0	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	0	0