Northwest Arkansas Community College

(Science and Mathematics Division)

Discipline Code

MATH

Course Number

2103

Course Title

Discrete Mathematics

Catalog Description

(On Demand) This course covers introductory topics in logic, proofs, study of sets, algorithms, graph theory and trees, and probability. Pre-requisites: College Algebra (Math 1203) with a C or better, or appropriate placement scores.

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College Algebra (MATH 1203) with a C or better, or appropriate placement scores (see college catalog).

Credit Hours

3 credit hours

Contact hours

45 lecture contact hours

Load hours

3 load hours

Semesters Offered

On Demand

Grade Mode

A-F

Learning Outcomes

Students completing this course will:

- Demonstrate the fundamental concepts of sets and logic and how they are used in the representation of real-world applications.

- Employ proofs to validate properties and arguments involving various concepts in discrete mathematics.

- Explain the fundamental concepts of functions and relations and how they are used to represent real-world applications.
- Perform fundamental analysis of an algorithm.
- Solve first and second order recurrence relations and use mathematical induction to verify the solution.
- Apply the fundamental properties and structure of trees, graphs, and networks to solve mathematical problems that can be represented by these structures.
- Use the fundamental properties of Boolean Algebras to derive other properties that can be used in real-world applications.
- Apply the concepts and techniques of discrete mathematics in the representation of real-world applications and be able to solve the resulting mathematical problem.

General Education Outcomes Supported

- Students can achieve mathematical literacy.

Standard Practices

Topics list

- Logical Form and Logical Equivalence
- Conditional Statements
- Valid and Invalid Arguments
- Predicates and Quantified Statements
- Direct Proofs and Counterexamples
- Indirect Argument: Contradiction and Contraposition
- Sequences
- Mathematical Induction
- Set Theory
- Probability
- Functions and Relations
- Sequences
- Modular Arithmetic
- Graph Theory

Learning activities

- Courses must, at a minimum, cover the core learning outcomes for each topic. Faculty may add to these outcomes, but may not omit any of them.

Assessments

- Assessment of student learning outcomes will be administered according to the math department's current assessment plan.