

Marshall University

College of Science

Mathematics Department

MTH 220: Discrete Structures

Course catalog description

Sets, relations, directed and undirected graphs, monoids, groups, lattices, Boolean algebra, and propositional logic.

Credit hours

3 hours

Prerequisites

ACT Math 27, or a grade of C or higher in MTH132, MTH229, or IST131.

List of topics

- Symbolic logic. Connectives, truth tables, Venn diagrams.
- Proof. Direct proof, proof by contradiction. Mathematical induction
- Finite set theory. Set operations. Set equality. Subsets. Power sets.
- Counting Principles. Multiplication principle, binomial coefficients. Probabilities.
- Relations and Functions.
- Trees and Graphs. Tree traversals. Spanning trees.

Course objectives

- Provide opportunities for students to explore the fundamental ideas of discrete mathematics.
- Prepare students to mathematically model situations and creatively solve problems for which they may never have seen examples.
- Prepare students to decide when and what technology is appropriate to solve a problem.

- Provide opportunities for students to communicate mathematical ideas in written and oral forms.
- Provide opportunities for students to read and interpret mathematical ideas independently.
- Prepare students to write their own proofs by initially providing opportunities for students to read and interpret proofs generated by others.
- Provide a historical perspective on the development of the material

Suggested textbooks

- Kolman, *Discrete Mathematical Structures*, 6th edition. ISBN: 978-0-132-29751-6
- Doerr and Levasseur, *Applied Discrete Structures*, version 2, March 2013

Last updated

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