

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

### **Last updated**

March 2014