

Math 2534: Discrete Mathematics
Spring 2024

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Text:	<i>Discrete Mathematics with Applications</i> , 5th ed. by Susanna Epp (textbook not required, but very useful)		
Canvas:	https://canvas.vt.edu/courses/147839		

Per Math Department policy, no further specifics of this course policy sheet may be made publicly available.

Tentative Schedule

- Week 1** M.L.K. Junior Day
§2.1 - Logical forms and logical equivalence
- Week 2** §2.2 - Conditional Statements
§2.3 - Valid and Invalid Arguments
§3.1 - Predicates and Quantified Statements I
- Week 3** §3.1 - Predicates and Quantified Statements I
§3.2 - Predicates and Quantified Statements II
§3.3 - Statements with Multiple Quantifiers
- Week 4** §3.4 - Arguments with Quantified Statements
§4.1 - Direct Proof and Counterexample I: Introduction
- Week 5** §4.1 - Direct Proof and Counterexample I: Introduction
Exam 1 Review
- Week 6** Exam 1
§4.1 - Direct Proof and Counterexample I: Introduction
§4.3 - Direct Proof and Counterexample III: Rational Numbers
§4.4 - Direct Proof and Counterexample IV: Divisibility
- Week 7** §4.4 - Direct Proof and Counterexample IV: Divisibility
§4.5 - Direct Proof and Counterexample V: Division into Cases
§4.7 - Indirect Argument: Contradiction and Contraposition
§4.8 - Three Famous Theorems: ($\sqrt{2}$'s irrationality, infinitude of prime numbers, $A = \pi r^2$)
§5.1 - Sequences
- Week 8** Spring Break
- Week 9** §5.6 - Recursive Sequences
§5.2 - Mathematical Induction I: Proving Formulae
§5.3 - Mathematical Induction II: Applications
§5.4 - Strong Mathematical Induction, Quotient–Remainder Theorem
- Week 10** §5.4 - Strong Mathematical Induction, Quotient – Remainder Theorem
§6.1 - Set Theory: Definitions and the Element of Proof
§6.2 - Properties of Sets
- Week 11** §6.2
§6.3 - Disproofs and Algebraic Proofs
Exam 2 Review
- Week 12** Exam 2
§6.3 - Disproofs and Algebraic Proofs

§7.1 - Functions on General Sets

Week 13 §7.1 - Functions on General Sets
§7.2 - One-to-one, Onto, and Inverse Functions

Week 14 §7.3 - Composition of Functions
§7.4 - Cardinality, Cantor's Diagonal Argument, Towers of Power Sets

Week 15 §8.1 - Relations on Sets
§8.2 - Reflexivity, Symmetry, and Transitivity

Week 16 §8.3 - Equivalence Relations
§8.4 - Partial Order Relations
Final Exam Review