Mathematics 2345: Discrete Mathematics
Topics for Exam 1
Fall 2013

The exam will cover Chapter One and sections 2.1—2.3 from the textbook including all topics covered in slides, lectures, homework, handouts, and worksheets in Weeks 1—5, plus Monday next week. The following list of topics may help you in your preparation for the test.

• Logic — including:
  – Propositional Logic, conditionals, truth tables
  – tautology, contradiction, contingency
  – ∧, ∨, ¬, Exclusive or (⊕)
  – Propositional Equivalences, DeMorgan’s Laws
  – logical equivalence – proof by reasoning, proof with truth tables
  – implication, inverse, converse, contrapositive, biconditional
  – predicates — binding variables, quantifiers, nested, negating
  – Rules of inference, fallacies, valid arguments
  – Proof methods: direct, indirect, contraposition, contradiction, vacuous, trivial, by cases, existence,
    – bit operations

• Sets
  – specifying sets
  – common sets: \( \mathbb{R}, \mathbb{N}, \mathbb{Z}, \mathbb{Z}^+, \mathbb{Q} \)
  – \( \subseteq, \subset, \emptyset, \mathcal{P}(A) \)
  – cardinality, finite, infinite
  – cartesiann product
  – set operations: equality, \( \cup, \cap, \) complement, difference, symmetric difference (⊕)