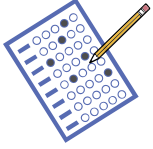


Final Study Guide

Spring 2018

Exam Information


- 2 hours
- 300 points
- Covers the entire semester



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Exam Time


- MWF 11:00 am**
 - Monday, May 14
 - 10:15am - 12:15pm
- MWF 2:00 pm**
 - Wednesday, May 16
 - 12:45pm - 2:45pm
- TR 9:00 am**
 - Tuesday, May 15
 - 10:15am - 12:15pm



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Sets – Need to Know

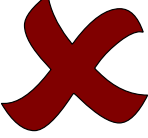
- Standard sets (\mathbb{Z} , \mathbb{Q} , etc...)
- Set Builder notation
- Set operators
- Venn diagrams
- Tuples
- Power sets
- Cross products
- Binary numbers
- Bit vectors



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Sets – Don't Worry About


- Example sets (Meeseeks)
- Encoding IEEE floating point numbers (still need to know the concept, though)



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Relations – Need to Know

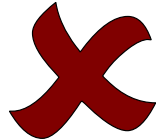
- Binary relations
- Types of relations
- Manipulating Relations
- Closures
- Functions
- Composition
- Database terminology



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Relations – Don't Worry About

- SQL
- Different programming language notations



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Logic – Need to Know

- Boolean operators
- Implication!
- Precedence
- Tautology / contradiction
- Logic equivalences
- Valid arguments
- Logical fallacies



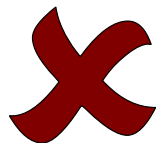
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Logic – Don't Worry About

- George Boole
- My "Gold Rush" example
- Boolean Algebra & Proofs
- Duels



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Proof – Need to Know

- Theorems & Definitions
- Direct proof
- Proof by contrapositive
- Predicate logic
- Quantifiers
- Induction



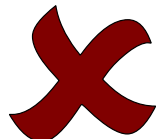
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Proof – Don't Worry About

- Proof by contradiction (still know the approach)
- Strong induction



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Circuits – Need to Know

- Gates
- Convert circuit to expression
- Convert expression to circuit
- Creating an arbitrary circuit
- Disjunctive normal form
- Karnaugh maps (and how they work)



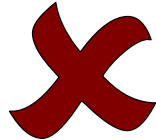
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Circuits – Don't Worry About

- Defining Boolean Logic
- Functional completeness (but know why important)



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Graph Theory – Need to Know

- Vertices
- Edges
- Paths & Cycles
- Connected/unconnected
- Directed
- Weighted graphs
- Trees
- Complete graphs



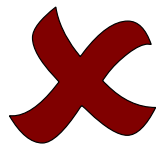
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Graph Theory – Don't Worry About

- Birth of graph theory
- Examples



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Recursion – Need to Know

- Recursion
- Order of growth



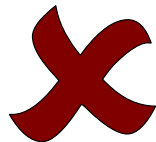
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Recursion – Don't Worry About

- Analyzing algorithms
- Historical perspective
- Big-O math
- Examples



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Languages – Need to Know

- Regular expressions
- Finite automata (just the concept, I won't ask you to create one)



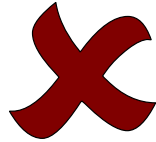
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Languages – Don't Worry About

- Regular expressions in languages
- Regular expressions to automata



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Counting – Need to Know

- Sum rule
- Product rule
- Inclusion-exclusion
- Pigeonhole principle



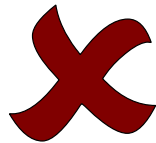
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Counting – Don't Worry About

- Permutations and combinations



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