

CISC 1400
Discrete Structures
Review Topics
Midterm Exam

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- Date: Monday 10 June 2019
- 110 points' worth of questions on Chapters 1–4
- Graded on a 100-point basis
- Questions based on exercises on text (either assigned or unassigned)
- One double-sided $8\frac{1}{2} \times 11$ -inch sheet of notes

- Operations ($\in, \subset, \subseteq, \cap, \cup, -, \times, \mathcal{P}, ', |\cdot|$)
- Venn diagrams
- Principle of inclusion/exclusion

- Sequences
 - What is the next term in a sequence?
 - Determine recursive formula for a sequence
 - Determine closed formula for a sequence
- Summation notation
- Proof by induction

- English into propositions (and vice versa)
- Operations $'$, \wedge , \vee , \oplus , \Leftrightarrow , \Rightarrow
- Propositional equivalence
- Truth tables
 - Definition of operations
 - Proving and disproving propositional equivalences and implications
- Parse trees
- Duality
- Predicates

Chapter 4: Relations

- Relation from X to Y : set of ordered pairs from $X \times Y$.
- Relation on X : relation from X to X
- Terminology
 - domain
 - codomain
 - rule or description
- Understand descriptions of relations:
 - a set of pairs
 - explicit listing
 - a rule: $\{(x,y) \in X \times Y : p(x,y)\}$ for some predicate $p: X \times Y \rightarrow \{\text{True}, \text{False}\}$
 - a graph
- Know whether a relation on some set satisfies the five properties:
 - reflexive
 - irreflexive
 - symmetric
 - antisymmetric
 - transitive