

## Fall 2018 COT 3100 Exam #1 Review

### Exam Format

Several Free Response Questions, 75 points total

*BRING BLANK SCRATCH PAPER  
YOU WILL BE PROVIDED REFERENCE SHEETS*

### Exam Outline

#### I. Logic and Proof

- a. Boolean variables, operators (xor not required)
- b. Implication and related statements
  - i. inverse
  - ii. converse
  - iii. contrapositive
- c. Truth Tables
- d. Logic Laws and application
- e. Predicates and Quantifiers
- f. Nested Quantifiers
  - i. When order matters
  - ii. How to disprove a nested quantifier statement
- g. Rules of Inference
- h. Some Definitions and Preliminaries
  - i. Divisibility
  - ii. Mod
  - iii. Algebra with expressions
- i. Proof Techniques
  - i. Direct Proof
  - ii. Proof by Contradiction
  - iii. Proof of Contrapositive
  - iv. Proof by cases

#### II. Sets

- a. Definitions ( $\in, \subseteq, \subset, \cap, \cup, \bar{A}, -, \times, \emptyset$ )
- b. Set Table
- c. Laws
- d. Operations
- e. Use of Proof Techniques