



Mohamed G. Gouda Mike A. Myers Centennial Professor of Computer Sciences



Mohamed G. Gouda
Spring 2015

CS 311

Syllabus

This course discusses the Foundations of Computer Science.

1. Boolean Formulas:
Definitions, Equivalence, Satisfiability, Normal Forms
2. Predicates:
Definitions, Quantifiers, Equivalence, Nested Quantifiers
3. Proof Styles:
Guessing, Case Analysis, Direct Inference, Indirect Inference,
By-Contradiction, Two-Sided Inference, Using Proven Predicates,
Induction
4. Graphs:
Definitions, Handshake Theorem, Coloring, Connectivity,
Bi-Partite Graphs, Trees, Planar Graphs
5. Sets:
Definitions, Operations on Sets, Set Laws
6. Functions:
Definitions, Injective, Surjective, and Bijective Functions,
Inverse Functions, Function Composition
7. Recurrences:
Definitions, Solving Recurrence Equations
8. Big Notations:
Big-O Notation, Big-Omega Notation, Big-Theta Notation
9. Program Annotation:
Hoare's Triples, Loop Invariants, Well-Foundedness

Textbook:

Kenneth Rosen, Discrete Mathematics and Its Applications, Seventh Edition,
McGraw Hill, 2012

Instructor:

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Grades:

10 points on attending exercise sections
30 points on three homeworks (10 points on each homework)
60 points on three midterms (20 points on each midterm)

Important Dates:

[University of Texas](#)
[Department of Computer Sciences](#)

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