Schedule of Topics
CSC/MAT 208, “Discrete Structures”
Department of Computer Science
Grinnell College
January 23, 2019

January 23: Overview; R7RS Scheme
Reading: Four handouts: “General Information”; “Scheme: a Refresher”; “Scheme in DrRacket”; and “Definitions and Libraries.”

January 25: Libraries in R7RS Scheme
Reading: Lehman, Leighton, and Meyer, from the beginning of part I through section 1.4 (pages 3–11).

January 28: Proofs and the Axiomatic Method
Reading: Lehman, Leighton, and Meyer, sections 1.5 through 1.10 (pages 11–19).

January 30: Proof Patterns
Reading: Lehman, Leighton, and Meyer, problems for chapter 1 (pages 20–28).

February 1: Practice with Proofs
Reading: “Basic Text Formatting and Typesetting with \LaTeX”; “Short Math Guide for \LaTeX.”

February 4: \LaTeX and the amssymb and amsmath Macro Packages
Reading: Lehman, Leighton, and Meyer, from the beginning of chapter 3 through section 3.2 (pages 47–54).

February 6: The Propositional Calculus: Notation, Axioms, and Rules of Inference
Reading: Handout: “The Propositional Calculus.”

February 8: The Propositional Calculus: Theorems and Proofs
Reading: Lehman, Leighton, and Meyer, sections 3.3 through 3.5 (pages 54–63).

February 11: Validity and Satisfiability
Reading: Lehman, Leighton, and Meyer, from section 3.6 to the end of chapter 3 (pages 63–102).

February 13: The Predicate Calculus: Notation, Axioms, and Rules of Inference
Reading: Handout: “The Predicate Calculus.”

February 15: The Predicate Calculus: Theorems and Proofs
Reading: Handout: “Axiom Systems and Mathematical Theories.”

February 18: The Theory of Identity; Peano Arithmetic

February 20: (pause for breath)
Reading: Handout: “Records in Scheme.”

February 22: Records in Scheme
Reading: Lehman, Leighton, and Meyer, from the beginning of chapter 4 through section 4.1 (pages 103–107).

February 25: Sets
Reading: Handout: “Laws of Sets.”

February 27: Naive Set Theory: Theorems and Proofs

March 1: Sequences, Functions, and Binary Relations
Reading: Handout: “Laws of Relations.”

March 4: Partial Orderings and Equivalence Relations
Reading: Lehman, Leighton, and Meyer, from the beginning of chapter 5 through section 5.1 (pages 137–146) and chapter 2 (pages 29–45).

March 6: Mathematical Induction and the Well-Ordering Principle
Reading: Lehman, Leighton, and Meyer, from section 5.2 to the end of chapter 5 (pages 146–172).

March 8: Course-of-Values Induction
Reading: Lehman, Leighton, and Meyer, from the beginning of chapter 7 through section 7.4 (pages 217–232).

March 11: Structural Induction
Reading: Lehman, Leighton, and Meyer, section 7.5 (pages 232–238).

March 13: Combinatorial Games

March 15: (pause for breath)

April 1: Rules for Counting
Reading: Handout: “Bags.”

April 3: Bags
Reading: Handout: “Permutations and Combinations.”

April 5: Permutations and Combinations
Reading: Handout: “Factorials, Falling Powers, and Binomial Coefficients.”

April 8: Binomial Coefficients
Reading: Handout: “Set Partitions and Stirling Numbers.”

April 10: Set Partitions
Reading: Handout: “Integer Partitions and Bell Numbers.”

April 12: Integer Partitions
Reading: Handout: “Binary Trees and Catalan Numbers.”

April 15: Binary Trees

April 17: (pause for breath)
Reading: Handout: “Semantics of the Predicate Calculus.”

April 19 and 22: Semantics of the Predicate Calculus

April 24: Divisibility

April 26: Euclid’s Algorithm

April 29: Prime Numbers
Reading: Lehman, Leighton, and Meyer, sections 9.6 and 9.7 (pages 362–367).

**May 1:** Modular Arithmetic


**May 3:** Multiplicative Inverses in Modular Arithmetic

Reading: Lehman, Leighton, and Meyer, section 9.10 (pages 373–378).

**May 6:** Euler’s Theorem

Reading: Lehman, Leighton, and Meyer, from section 9.11 to the end of chapter 9 (pages 378–420).

**May 8:** Public-Key Cryptography

**May 10:** Review; Student Evaluations

**Friday, May 17:** Final Examination (section 01: 2 to 5 p.m.; section 02: 9 a.m. to noon)