

CSE 213
Foundations of
Computer Science II

www.cs.sunysb.edu/~leo/cse213.html

Prof. Leo Bachmair

Course Objectives

1. Continue the development of a strong theoretical foundation for subsequent courses in the computer science curriculum.
2. Introduce descriptive structures such as sets, equivalence relations, and partial orders.
3. Introduce construction techniques for formal languages, including grammars and inductive definitions.
4. Provide students with more advanced proof techniques based on predicate logic and well-founded induction.

Course Topics

1. Set theory [Sections 1.2 and 2.4]
 - (a) Definitions
 - (b) Set operations
 - (c) Infinite sets
 - (f) Applications
2. Ordered Structures [Section 1.3]
 - (a) Tuples
 - (b) Lists
 - (c) Strings and languages
3. Construction Techniques [Chapter 3]
 - (a) Inductively defined sets
 - (b) Grammars
4. Relations [Chapter 4]
 - (a) Basic concepts
 - (b) Equivalence relations
 - (c) Order relations
 - (d) Closures of relations
 - (e) Well-founded induction schemas
5. Review of elementary logic [Chapter 6]
6. Predicate logic [Chapter 7]
 - (a) Predicates and quantifiers, syntax and semantics
 - (b) Equivalence of formulas
 - (c) Formal proofs