

Math 120

Syllabus Spring 2012

Math 120 is an introductory course in discrete mathematics for computer science majors. Typically the students are at the level of Math 141 or Math 151. One of the objectives is that students learn what is a proof, and what is not a proof; therefore tests should require simple proofs, e.g. propositions from the elementary number theory covered in Chapter 4. The computer science department requests that induction should receive special attention.

Text: Discrete mathematics and its Applications, 7th Edition
Kenneth Rosen, McGraw Hill 2012

The hours below are based on 42 class hours. six hours are reserved for tests and review

Chapter 1 12 hours

- 1.1 Propositional Logic
- 1.2 Applications of Propositional Logic
- 1.3 Propositional Equivalences
- 1.4 Predicates and Quantifiers
- 1.5 Nested Quantifiers
- 1.6 Rules of Inference
- 1.7 Introduction to Proofs
- 1.8 Proof Methods and Strategy

Students should learn to write and to de-bug proofs, but need not know the names of formal rules of inference in Section 1.6.

Chapter 2 6 hours

- 2.1 Sets
- 2.2 Set Operations
- 2.3 Functions
- 2.4 Sequences and Summations
- (2.5 Cardinality of Sets, OPTIONAL TOPIC, cover only if class is strong and time permits)
- 2.6 Matrices (important since CS majors no longer all take linear algebra)

Chapter 4 6 hours

- 4.1 Divisibility and modular arithmetic
- 4.2 Integer representations and Algorithms
- 4.3 Primes and GCD (cover as much as time and strength of class permits)

Chapter 5 6 hours

- 5.1 Mathematical Induction

5.2 Strong Induction and well ordering

Chapter 6 6 hours

6.1 Basics of Counting

6.2 Pigeonhole Principle

6.3 Permutations and Combinations

If time is short emphasize Chapter 5 and cover as much of Chapter 6 as time permits