

Carthage Mathematics Department
Course Summary for Math 121 Discrete Structures

1. Credits: 4 cr.
2. Semesters Offered: J-term
3. Text(s): *Notebook for Discrete Structures* by Snively, or *Discrete Mathematics* by Johnsonbaugh
4. Topics Covered:
 - a. Symbolic Logic and Truth Tables
 - b. Quantified statements and quantifiers
 - c. Mathematical Proofs
 - i. Direct
 - ii. Contradiction
 - iii. Induction
 - d. Algorithms
 - e. Set Theory
 - f. Equivalence Relations
 - g. Basic Combinatorics
 - h. Graph Theory
 - i. Paths and Cycles
 - ii. Trees
 - iii. Spanning Trees
5. Skills Enhanced:
 - a. Mathematical Investigation, insight into mathematics research
 - b. Logical thinking and argumentation
 - c. Proof writing
6. Sample Syllabus: (Johnsonbaugh, Fifth Edition)
 - a. Chapter 1, omitting Section 1.5
 - b. Chapter 2, omitting Section 2.7
 - c. Section 3.3
 - d. Chapter 4
 - e. Chapter 6
 - f. Chapter 7, up to and including Section 7.5
7. Miscellanea
 - a. Many other topics are often covered, including proofs in symbolic logic, voting theory, apportionment, discrete dynamical systems, polyominoes and tiling, number theory, board games.
 - b. A mini research project is often included as part of this course.