Course Description
Covers Boolean algebra, combinatorial and sequential circuits, algorithms and algorithm analysis, recursion, recurrence relations, graphs, and trees.

General Course Purpose
Most students who enroll in the Computer Science specialization of the Science AS degree at Northern Virginia Community College transfer to any VCCS System. GMU and Other universities has an introduction to discrete structures course in the second year of the Computer Science BS degree that must be taken before students can complete upper level courses in Computer Science. Students who have not taken this course are not allowed in the upper level Computer Science courses and are at a disadvantage trying to finish the Computer Science BS degree in two years at the transfer institution. The Introduction to Discrete Structures course will be taken as an approved elective so that students transferring to institutions in Computer Science not requiring this course will not have to take it at the community college.

Course Prerequisites/Corequisites
Prerequisite: CSC 208

Course Objectives
Upon completing the course, the student will be able to:

- Recall the basic results in number theory, logic, combinatorics, and graph theory
- Analyze algorithms and their complexity, while being able to refer to the time and space required to execute them
- Discuss recursive algorithms
- Determine if a recursive solution is more efficient than an iterative one.
- Introduce recurrence relations
- Analyze how recurrence relations relate to recursive algorithms and what types of problems are solved using these methods
- Explain how recurrence ties to complexity analysis
- Demonstrate ability of understanding and constructing mathematical proofs
- Develop Mathematical arguments and proof strategies
- Discuss graph theory, ways of representing graphs, and applications of graphs
- Discuss the terminology, subclasses, and applications of trees
- Explore the relationship of Boolean algebra and electronic circuits
- Demonstrate ability to introduce network models and Karnaugh maps
- Solve problems in a creative way, demonstrating critical thinking

Major Topics to be Included
- Algorithm analysis
- Recurrence relations
- Graph theory
- Trees
- Boolean algebras and combinatorial circuits