A better title for this course would be **Foundations of Computer Science**. We will learn the topics involving discrete structures essential to design and implement algorithms and software. These topics include sets, strings, data structures, graphs, trees, circuits, models of computation, etc. This material makes use of more mathematical machinery than other CS courses at this level. I will motivate the new techniques we need to learn by showing their applicability in Computer Science.

This course is about problem solving techniques that are needed to create algorithms and programs. Hence the best way to learn this material is by solving lots of problems. For this purpose, I require you to get the Student’s Solutions Manual that goes with the text book; it contains solutions to all the odd numbered problems in the text. One of the best features of the text book, *Discrete Mathematics and its Applications* (third edition), McGraw Hill, 1995 is the large number of problems at the end of each section and each chapter. Please solve many problems from these collections, and not only the ones I ask you to turn in as Homework. Try to solve the problems yourselves before you look at the solutions provided in the Student Manual—you will learn more this way.

I expect all work turned in for grading to be your own. You are not permitted to discuss your solutions with other students, or to look at other students’ solutions as you write up your own answers. Students who copy others’ work, or who permit others to copy their solutions will be liable for disciplinary consequences. All students are required to abide by Old Dominion University’s honor code. Any violation of the honor code will be entered in your permanent academic record.

**Grading.** You will receive weekly Home Work, and you will have a week to turn them in. There will be two exams during the term: Wed Oct 7, and Wed Nov 4 (both in class), and a final exam on Wed Dec 16 from 3:45 – 6:45 P.M. The Homework will account for 25% of your grade; the two midterm exams for 40%; and the final for 35%. The weight given to Homework reflects the importance I attach to learning throughout the semester.
SYLLABUS

I: Foundations: Logic, Sets, Functions, Big Oh notation and growth of functions.
II: Algorithms: Running Time Complexity, Search and sorting algorithms.
IV: Recurrence relations, Principle of Inclusion-Exclusion.
V: Relations: Representations of relations, Closure, Equivalence relations, Partial Orders, Relational databases.
VII: Boolean Algebra, Logic gates, Minimization of Circuits (If time permits).

I will use Maple (a computer algebra programming system) to illustrate the algorithms we discuss in class. You will find Maple or another computer algebra package in which you can quickly write programs to be an effective learning aid.

All lecture notes, Home works, and solutions in this course will be available on the Webbook at the URL http://dragon.iri2.tel.edu.edu/~webbook. I will announce the details once it is set up. The notes are meant to free you from taking detailed notes in class, so you can think with me during the lecture. They are not meant to be a complete representation of what transpired in class. If you miss a lecture, you will need to obtain notes from another student to learn what transpired in lecture.