CS4124 Theory of Computation **MWF 11:00 McBryde 224** **Index 5314**

Instructor: L. T. Watson, 630 McBryde, 231-7540, `ltw@cs.vt.edu`
Office Hours: 9:30–10:50 MWF, 17:00–17:30 W, and by appointment.

Text: Notes at A-1 Copies (University Mall).

Topics Covered: Finite State Machines, Transition Tables and Diagrams, Equivalence and Machine Minimization, Identification Experiments, Abstract Programs, Machines, Proving Program Correctness, Machine Simulation and Equivalence, Register Machines, Turing Machine, Church's Thesis, While Structure of Register Programs, Recursive Function Theory, Unsolvable Problems, Automata, Kleene's Theorem, Program Equivalence, Languages, Grammars, Decidability, Acceptability, Generability, Pushdown Store Machine.

Grading: FINAL GRADE will be an average of the midterm and final examinations, and the presentation of several homework assignments in class.

Midterm Exam: Friday, October 24, 1997; format to be decided.

Final Exam: 13:05–15:05, Monday, December 15, 1997.

References:

Clark and Cowell, *Programs, Machines, and Computation*, McGraw Hill, 1976.

Davis and Weyuker, *Computability, Complexity, and Languages*, Academic Press, 1983.

Denning, Dennis, Qualitz, *Machines, Languages, and Computation*, Prentice-Hall, 1978.

Gill, *Introduction to the Theory of Finite State Machines*, McGraw-Hill, 1962.

Hopcroft, Ullman, *Introduction to Automata Theory, Languages, and Computation*, Addison-Wesley, 1979.

Kain, *Automata Theory, Machines, and Languages*, McGraw-Hill, 1972.

Kfoury, Moll, Arbib, *A Programming Approach to Computability*, Springer-Verlag, 1982.

Manna, *Mathematical Theory of Computation*, McGraw-Hill, 1974.

McNaughton, *Elementary Computability, Formal Languages, and Automata*, Prentice Hall, 1982.

Minsky, *Computation: Finite and Infinite Machines*, Prentice-Hall, 1967.

Rogers, *Theory of Recursive Functions and Effective Computability*, McGraw-Hill, 1967.