CS 150, Fall 2002: Automata and Formal Languages

The course deals with the study of formal grammars, finite-state automata, push-down automata, Turing machines, time- and storage-bounded Turing machines, semantics of programming languages, elements of recursive function theory, and complexity of computation.

Instructor: Stefano Lonardi (`stelo@cs`), Surge 320, phone: x2203, Office hours: Wed 4:30-5:30PM, Fri 4:30-5:30PM, or by appointment.

TAs: Yu Luo (`yuluo@cs`, Office hours: Wed 9:10-10:00pm) and Ling Ling Jin (`ljin@cs`, Office hours: Mon 4:00-5:00pm) – discussion sessions starts Monday Oct 7th

Course Format: Three 50-minute lectures and one hour discussion per week, five howeworks, two quizzes, one final.

Textbook: Peter Linz, An Introduction to Formal Languages and Automata, Jones and Bartlett Publishers. Third Edition. ISBN: 0763714224

Prereq: CS 14, MATH 112. The prerequisites are strictly enforced. In particular, if you registered, but later failed some prerequisite, you will be dropped from this course.

Prereq by topic: sets, sequences, relations, functions, combinations, counting, recurrences, asymptotic notation, linear algebra (matrices, determinants), directed and undirected graphs, connectivity, proof methods (induction, contradiction), basic data structures (lists, stacks, binary trees) sorting, searching, graph traversal algorithms.

Tentative list of topics: finite automata (DFA and NFA), equivalence of DFA and NFA, minimization of DFA, regular expression, conversion of regular expressions to NFA, conversion of NFA to regular expression, closure properties of regular languages, non-regular languages, pumping lemma, context-free grammars, Chomsky normal form, the CYK algorithm, pushdown automata, pumping lemma, properties of context-tree grammars, Greibach normal form, $LL(k)$ grammars, Turing machines.

Homeworks: Five bi-weekly homework assignments will be posted on the class homepage. Assignments will be collected in class, before the class starts. We strongly encourage to type the assignment papers, or otherwise write very clearly. The use of LaTeX is recommended, but not required. Other word processors that can handle mathematical notation are acceptable (including Word). Unreadable assignments will **not** be graded.

Quizzes: Two quizzes, in class. Dates to be announced.

Final: Monday Dec 9, 2002, 3:00-6:00PM.

Grading: Quiz 1 15%, Quiz 2 20%, Final 50%, Homeworks 15%. Course grades are expected to be determined as follows: A = 80–100, B = 70–80, C = 60–70, D = 50–60. Minor adjustments of this scale can be made later during the quarter.

Plagiarism policies are described in a separate document that will be handed out. We ask the students to read and sign the document.

CS150 mailing list/newsgroup: All students are strongly encouraged to subscribe to the CS150 mailing list using their CS account (no Yahoo, Hotmail, etc.) General interest questions related to CS150 and announcements will be mailed to this list.

Course homepage: `http://www.cs.ucr.edu/~stelo/cs150/`