



Dept. of Computer Science and Engineering

DIT321, Finite automata theory and formal languages, 7.5 ECTS Credits

Basic Level

1. Establishment

The Faculty Board at the IT-university established the course plan at 2006-11-17. This course plan is effective from autumn 2007.

Educational area: Technology/Sciences

2. Location

The course is a part of the Computer Science Master's programme and an elective course at Göteborg University.

3. Knowledge Requirements

The requirement for the course is to have successfully completed 22,5 credits of computing science and 22,5 credits of mathematics of an education aiming at a bachelor degree within Computer Science or equivalent. Familiarity with a basic knowledge of discrete mathematics is assumed.

4. Learning Outcomes

Finite automata are basic mathematical models of some physical systems. The theory of finite automata is fundamental in computer sciences, and is becoming more and more important. Besides having direct concrete applications, it is mathematically simple and elegant. It provides ideal illustrations of basic notions in mathematics (set theory, proof by induction).

5. Content

The main applications in the text book (besides a mathematical model of a protocol) are about text search, lexical analysis and parsing. Other kind of applications (model of vending machines, traffic signals, etc...) require the notion of finite state transducers (Mealy machines), whose theory is almost identical to the one of finite automata.

We will make extensive use of graphs, trees, sets, functions, relations, equivalence relations, and partial orders, and this course can be seen also as a way to be more familiar with these fundamental mathematical concepts.

To be familiar with these mathematical concepts should be a required prerequisite for all the advanced courses in computing sciences.

6. Literature

See separate literature list.

7. Examination

The course is examined by a written exam at the end of the course.

8. Marks

The course is graded with the following marks: Fail, Pass, Pass with Distinction. The course can also, at the students' request, be marked according to ECTS standards.

9. Evaluation

The course is evaluated through meetings both during and after the course between teachers and student representatives. Further, an anonymous questionnaire can be used to ensure written information. The outcome of the evaluations serves to improve the course by indicating which parts could be added, improved, changed or removed.

10. Other

The course is held in English.