Formal Languages and Automata Theory

Programme course

6 credits

Formella språk och automatateori

TDDD85

Valid from: 2017 Spring semester

Determined by
Board of Studies for Computer Science
and Media Technology

Date determined
2017-01-25

Main field of study
Computer Science and Engineering, Computer Science

Course level
First cycle

Advancement level
G1X

Course offered for
- Computer Science and Software Engineering, M Sc in Engineering

Specific information
This course is not available for exchange students

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Basic mathematics, for instance given by discrete mathematics courses

Intended learning outcomes
This course will give an introduction to formal languages and automata theory. Automata and formal languages appear (possibly in various disguises) in almost every branch of computer science. Having completed the course the student will be able to:

- Deal with regular and context-free languages; explain and analyse their descriptions.
- Describe relations between languages and language classes.
- Apply basic parsing methods.
- Explain Turing machines.

Course content
Finite automata and regular expressions. Context-free languages and pushdown automata. Deterministic context-free languages, LR parsing. Chomsky's hierarchy. Introduction to Turing machines.

Teaching and working methods

The theory is presented during the lectures. Problem solving is practiced during the lessons.

Examination

UPG2	Compulsory lab assignments	1 credits	U, G
TEN1	Written examination	5 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

Supplementary courses:
Compiler Construction, Complexity Theory, Rewriting Systems, Programming Theory, Logic, advanced course

Department

Institutionen för datavetenskap

Director of Studies or equivalent

Ahmed Rezine

Examiner

Johannes Schmidt

Education components

Preliminary scheduled hours: 50 h
Recommended self-study hours: 110 h

Course literature

D. C. Kozen, Automata and Computability, 1997, Springer Verlag. Kompendium, publiceras på webben.

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.