Compiler Construction 7.5 credits D7011E

Kompilatorteknik

Course syllabus admitted: Autumn 2016 Sp 1 - Present

DECISION DATE
2016-02-15

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Compiler Construction 7.5 credits D7011E

Kompilatorteknik

Second cycle, D7011E

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Datalogi	Computer Technology

Entry requirements

Good knowledge of imperative programming (D0009E) and object-oriented programming & design (D0010E). Functions and relations, set theory, state automata (M0009M). Searching and sorting, common data structures like queues, stacks, lists, trees and graphs (D0012E). Stack-based assembly programming (D0013E).

Selection

The selection is based on 30-285 credits

Examiner

Per Lindgren

Course Aim

The student shall be able to

-       Demonstrate the ability to identify and formulate compilation of a high-level programming language into executable machine code as a multi-phase translation process.

-       Demonstrate the ability to implement a compiler for a non-trivial language using appropriate methods.

-       Demonstrate the ability to present and discuss the technological solutions chosen for such an implementation in writing, in an international context.

-       Demonstrate a considerable degree of specialized knowledge in the theoretical foundations of compiler technology.

-       Demonstrate the competence and skill to systematically use proven tools for compiler construction.

-       Demonstrate the ability to analyze and critically evaluate different aspects of modern high-level languages on basis of their underlying implementation techniques.

Contents

The organization of a compiler as a multi-phase translation process. Lexical analysis, syntax analysis, and translation into abstract syntax. Regular expressions and grammars, lexer and parser generators. Identifier handling and symbol table organization. Type-checking, logical inference systems. Intermediate representations and transformations for different languages. Code optimization and register allocation. Machine code generation for common architectures.

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Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.

Teaching consists of lectures, seminars and laboratory work. Lab assignments are reported in writing or by demonstration, and may be associated with a deadline. Homework assignments that render credit marks on the subsequent written exam may also occur during the course.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

Written exam as well as written or oral lab assignment reports. Passing the lab assignment part of the course requires a passed grade on all individual assignments.

Remarks

Credits for this course cannot be combined with credits for SMD002.

Overlap

The course D7011E is equal to D7050E

Literature. Valid from Autumn 2007 Sp 1

Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman. Compilers: principles, techniques and tools (2nd ed.), Addison Wesley, 2007, ISBN: 0321486811.

Course offered by

Department of Computer Science, Electrical and Space Engineering

Items/credits

Number	Type	Credits	Grade
0001	Written exam	4.5	G U 3 4 5
0002	Laboratory work	3	U G#

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Jonny Johansson, HUL SRT 2016-02-15

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Syllabus established

by the Department of Computer Science and Electrical Engineering 2007-02-28

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