DIT975   Software Language Engineering for Domain-Specific Languages, 7.5 credits

Programvaruspråksteknik för domänspecifika språk, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Computer Science and Engineering on 2019-12-09 to be valid from 2021-01-18, spring semester of 2021.

Field of education: Science 100%
Department: Department of Computer Science and Engineering

Position in the educational system

The course is an elective course in the Software Engineering and Management Master's Programme. The course is also a single subject course at the University of Gothenburg.

The course can be part of the following programmes: 1) Computer Science, Master's Programme (N2COS), 2) Applied Data Science Master's Programme (N2ADS) and 3) Software Engineering and Management Master's Programme (N2SOF)

Main field of studies	*Specialization*
Software Engineering	A1N, Second cycle, has only first-cycle course/s as entry requirements
Applied Information Technology with Specialization in Software Engineering and Management	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

To be eligible for this course, the student must have;

1. a Bachelor degree in Software Engineering, Computer Science or equivalent,
2. successfully completed a 7.5 hec course in Object oriented Programming (such as DIT948 programming, DIT952 Object oriented Programming and Design or equivalent)

Applicants must prove knowledge of English: English 6/English B or the equivalent level of an internationally recognized test, for example TOEFL, IELTS.

Learning outcomes
After completing the course the student should be able to:

Knowledge and understanding
- explain the following concepts: models, metamodel, constraints, transformation, semantics, abstract and concrete syntax
- explain the architecture of contemporary modeling frameworks
- explain how domain specific modeling languages can be realized within a contemporary modeling framework
- explain current research trends in domain-specific language (DSL) engineering

Competence and skills
- construct domain specific languages, e.g. specify meta models including syntax and semantics
- define syntactic constraints using a constraint language
- implement meta models within a modeling framework
- construct model editors within a modeling framework
- create model validators within a modeling framework
- specify model transformations, and realize them within a modeling framework
- apply the domain specific modeling approach to an authentic case

Judgement and approach
- identify emerging technologies for model-driven engineering using relevant information sources
- select appropriate domain specific modeling technology for a given tool
- propose effective strategies and concrete technologies for realizing parts of a DSL based on a concrete problem

Course content
Standard visual modelling languages, such as UML, do not often fit an organization's needs out of the box. Extending modelling languages with necessary constructs and features, or creating complementary languages, requires specialist knowledge beyond that of software modelling. The purpose of this course is to familiarize the student with contemporary technologies and notations for creation, adaptation, and transformation of modeling languages.

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Sub-courses
1. **Written hall examination** *(Skriftlig salstentamen),* 4.5 credits
   Grading scale: Pass with Distinction (VG), Pass (G) and Fail (U)

2. **Project** *(Projekt),* 3 credits
   Grading scale: Pass (G) and Fail (U)

Form of teaching
The teaching of this course will consist of different forms: lectures, literature studies, group work, group supervision, and practical assignments.

Language of instruction: English

Assessment
The examination consists of two parts: a final individual written hall examination carried out in an examination hall (4.5 hec) and a project (3 hec). The project is carried out in groups of normally 4-6 students.

The project part is graded individually, taking into account the group work as well as the student's individual contribution to the group work.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance)

In cases where a course has been discontinued or has undergone major changes, the student shall normally be guaranteed at least three examination occasions (including the ordinary examination) during a period of at least one year from the last time the course was given.

Grades
The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
 For Pass (G) as a complete course grade, both the written exam and the project part must have been awarded Pass. For Pass with Distinction (VG), the Project part must have been awarded Pass and the written exam must have been awarded Pass with Distinction.

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Course evaluation

The course is evaluated through meetings both during and after the course between teachers and student representatives. Further, an anonymous questionnaire is 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.

Additional information

The course is a joint course together with Chalmers.

In the Software Engineering Master's Programme, the course is part of a set of four courses, out of which the student need to take at least two.

The course replaces the course DIT596, 7.5 credits. The course cannot be included in a degree which contains DIT596. Neither can the course be included in a degree which is based on another degree in which the course DIT596 is included.

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