Course syllabus

Grundläggande funktionsprogrammering
Basics of Functional Programming

EDAF95, 5 credits, G2 (First Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED C/D
Date of Decision: 2023-04-18

General Information

Main field: Technology.
Compulsory for: D2
Language of instruction: The course will be given in English

Aim

The course gives an insight into how the functional programming often offers a possibility to write shorter and easier-to-understand programs than using the traditional imperative or object-oriented approaches.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- have a good understanding of the fundamental principles for functional programming
- understand the practical consequences of the differences in this paradigm relative to traditional programming
- know the common idioms of functional programming
- understand the benefits and the function of an advanced type system

Competences and skills
For a passing grade the student must

- be able to read programs written in a modern functional programming language
- be able to utilize the possibilities of the functional paradigm to write programs in a modern functional programming language
- be able to do type analysis of expressions in a modern functional programming language

Judgement and approach
For a passing grade the student must

- have learnt to appreciate the role of program code as a communication medium between people

Contents

The philosophy of functional languages. Introduction to a modern functional programming language. Language constructs and idioms. Higher-order functions. Lazy evaluation and infinite data structures. Polymorphic type systems. Type analysis and type inference.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Written examination. Mandatory lab assignments which are a basis for the assignments. To qualify for the exam students must have completed the assignments. The final grade of the course is based on the result of the written examination.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts
Code: 0119. **Name:** Assignments.
Credits: 1,5. **Grading scale:** UG. **Assessment:** To qualify for a passing grade the assignments must be completed.
Code: 0219. **Name:** Written Examination.
Credits: 2,5. **Grading scale:** TH. **Assessment:** To qualify for the exam the assignments must be completed. The final grade of the course is based on the result of the written examination. **Contents:** Written examination.
Code: 0319. **Name:** Labs.
Credits: 1. **Grading scale:** UG. **Assessment:** Completed laboratory work **Contents:** Lab work

Admission

Admission requirements:

- EDAA01 Programming - Second Course or EDAA30 Programming in Java - Second Course

Assumed prior knowledge: FMAA05 and FMAB20 or FMAA50 and FMAA55 or EDAA40. Students are expected to have basic understanding of mathematical functions, functional composition and proof by induction.
The number of participants is limited to: No
The course overlaps following course/s: EDA120, EDAN40, EDAF40

Reading list

- Web-based course material.
- Graham Hutton: Programming in Haskell, 2nd ed. Cambridge University Press, 2016, ISBN: 9780521692694. Recommended reference.
- Miran Lipovaca: Learn You a Haskell for Great Good. No starch press, 2011, ISBN: 9781593272838. Introduction to Haskell language.

Contact and other information

Course coordinator: Professor Jacek Malec, Jacek.Malec@cs.lth.se
Course homepage: http://cs.lth.se/edaf95