ID2012 Ubiquitous Computing 7.5 credits

Ubiquitous Computing

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for ID2012 valid from Autumn 2023

Decision to discontinue this course

The course will be discontinued at the end of Spring 2026 according to the head of school decision: J-2023-2991.Decision date: 2023-11-23The course is offered for the last time in Spring 2024. The last opportunity to take an examination in the course is in Spring 2026.Contact the examiner to be examined during the discontinuation period.

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Computer Science and Engineering

Specific prerequisites

Basic courses in mathematics, computer science, human computer interaction, artificial intelligence and programming of distributed systems.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

On successful completion of this course the student has knowledge and understanding regarding:

- the objectives and the historical development of the field of ubiquitous computing
- development in new materials
- fundamentals of sensor technology and sensor networks
- design of new (often embedded) interactive artefacts
- contextaware and adaptive systems
- middleware for fine-grained distributed systems
- analysis and coordination of complex systems
- new styles of interaction, e.g. tangible interfaces
- most important applications in the field
- general implications of the field.

Skills and capacities, to be able to:

- apply middleware techniques to implement ubiquitous computing systems
- design and implement coordination schemes for systems with many software and hardware components
- design and implement simple context aware applications, using standard sensor technology
- design and implement interfaces suitable for ubiquitous computing in particular tangible interfaces.

Values and attitudes, to be able to:

- compare the usability of alternative design of interactions for specific ubiquitous computing systems
- compare the adequacy of alternative coordination strategies for specific ubiquitous computing systems
- judge the user acceptance and relevance of specific designs for adaptive and context aware systems
- compare the adequacy of alternative middleware techniques for particular ubiquitous computing systems.

Course contents

Introduction to the field of ubiquitous computing including objectives of the field, core technologies, applications and implications for society. Core technologies are innovative materials, design of new computational artifacts, sensor technology, middleware for fine grained distributed systems, context aware systems, theory of complex systems, artificial intelligence techniques for coordination of behaviour (multi agent systems) and new forms of interaction. A specialization in middleware for ubiquitous computing with a bias on support for collaborative applications, context aware functionalities and tangible interfaces.

Examination

- INLA - Assignment, 1.5 credits, grading scale: P, F
- LABA - Laboratory Work, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- SEM1 - Seminar, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Assessment on the course consists of three assignments. To pass the whole course requires pass on all three.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.