Design and Development of Interactive Systems

Design och utveckling av interaktiva system
12 credits

Programme course

TDDE43

Valid from: 2025 Spring semester

Determined by	**Main field of study**	
Board of Studies for Computer Science and Media Technology	Information Technology	
Date determined	**Course level**	**Progressive specialisation**
2024-08-28	First cycle	G1F
Revised by	**Disciplinary domain**	
	Technology	
Revision date	**Subject group**	
	Computer Technology	
Offered first time	**Offered for the last time**	
Autumn semester 2019		
Department	**Replaced by**	
Institutionen för datavetenskap		

Specific information

The course can not be included in degree together with TDDC73, TDDD13 or TDDD35.

Course offered for

- Master of Science in Information Technology

Prerequisites

Basic knowledge of computer programming and system development.

The course is preferably taken in parallell with the course Diversity and gender in application development, alternatively the student should have corresponding knowledge in the area of gender and diversity.

Intended learning outcomes

Related to design of interactive systems, after completing the course the students should be able to:

- Plan, carry out, analyse, and communicate the results of user studies and usability tests, as well as based on this be able to define, prioritise, communication and evaluate design goals.
- Create, analyse, evaluate, and argue for a certain design solution, among alternative solutions, with respect to different perspectives such as design goals based on user studies, psychological factors and limitations, e.g., human factors in a security perspective, as well as diversity, gender, and accessibility.
- Construct and evaluate prototypes of a design solution.
- Communicate and motivate user studies, design, and usability test results both orally and in writing.

Related to development of interactive systems, with focus on user interfaces, after completing the course the students should be able to:

- Describe some current languages, environments/tools, and libraries for programming interactive systems.
- Construct and describe the architecture of an event-based system with graphical components.
- Use a few different programming languages and class libraries for programming interactive systems.
- Create their own interaction components.

- Apply design patterns for interaction techniques in their architecture and program dynamic interaction techniques.
- Describe the connection between class libraries for programming interactive systems and principles for user interface design.
- Plan and carry out a development project, and communicate and motivate the choices made.
- Individually describe and motivate the program code that has been developed.

Related to the student's role in a project group and a PBL-group, after completing the course the students should be able to:

- Independently and in a group, identify learning needs in relation to given problems related to the courses of this semester.
- Collaborate with colleagues both in learning and problem solving, and lead technical problem solving situations related to the courses of this semester.
- Contribute to discussions and results in a PBL-group.
- Contribute to planning and execution in a project group.
- Critically analyse their own role in the group, as well as the group as a whole, e.g., from a diversity and gender perspective.

Course content

The course is focused on development of interactive systems with good usability and a satisfactory user experience. Human-computer interaction is a central area of knowledge and practice in development of interactive systems. In an organisation developing interactive systems, or using systems, human-computer interaction is relevant for all roles, in different ways. This course provides the foundation for further studies and understanding of these roles, such as project leader, product owner, customer, interaction programmer, etc., based on how to perform human-centred development of interactive systems.

The course introduces an industry perspective on usability and interface development, through e.g. guest lecturers or other industry-related elements."

In addition, the course provides basic knowledge and skills in developing an interactive system based on a design, which meets the requirements of the target group of users, especially regarding the user interface.

The course also allows the students to practice project work and performing a development project in a group, as well as being the course connecting all the remaining courses of semester 3 of the IT-program, including to allow students to practice PBL group work with problems from all courses.

The course covers, related to design of interactive systems:

- Development of interactive systems that meet the needs of a target group of users.
- Basic concepts of human-computer interaction.
- Principles and methods for design and development of graphical user interfaces.
- User-centred system development.
- Basics concepts of cognitive psychology, related to design and usability.

The course covers, relatied to basic interaction programming:

- Architectures for event-based systems (e.g., using widgets).
- Class libraries for user interfaces.
- Interaction programming and design principles for gaphical user interfaces, e.g., how class libraries can support implementing conventions and interaction paradigms.
- Design patterns for interaction programming (e.g., MVC, Observer, Command, Decorator).
- Redesign and implementation of graphical user interfaces based on known usability issues.

Teaching and working methods

Teaching is done following the PBL, problem-based learning, principles, including among others the following resources; lectures, project, seminars, labs, and PBL group wourk based on scenarios.

The course is overall given as a project course, where the students work in groups on a project during the entire semester.

The course is the connecting course of the semester.

Note that participation (physical presence) is required in examinations, such as the PBL group work meetings, project presentations etc.

Examination

LAB1	Lab work	1 credits	U, G
BAS1	Tutorial work	2 credits	U, G
PRA1	Project work	5 credits	U, G
UPG1	Assignments	4 credits	U, 3, 4, 5

Grades for examination modules are decided in accordance with the assessment criteria presented at the start of the course.

Grades

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

Other information

Supplementary courses: Utveckling av interaktiva system, Interaktionsdesign

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

The course is campus-based at the location specified for the course, unless otherwise stated under “Teaching and working methods”. Please note, in a campus-based course occasional remote sessions could be included.