Course syllabus

Digitalisering - realisering och systemdesign med användarperspektiv
Design of Systems for Digital Transformation

EITA65, 15 credits, G1 (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: C1
Language of instruction: The course will be given in Swedish

Aim

The course gives a clear view of the goals and the overview of the programme, and gives a motivation for courses and subjects in the continuation of the studies. Courses later in the programme can refer to the system overview presented in this course. The focus of the course is to get an understanding of the overview and the link between the user expectations and the technical solutions, and, within a content, based on user demands make a choice of technical solutions.

The course objective is that the students after the approved course should have basic knowledge and ability within the area of digitalisation, e.g. understanding of the system and an ability to view it on different levels of abstraction.

Throughout the course, the students will learn how to make use of computers as tools with hands on abilities that can be used in the continued studies as well as in their continued working life. The student will start gathering a computer based toolbox to solve practical problems.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- Have knowledge of digitalisation, the technical implications and its impact on society.
- Be able to describe and use basic concepts within digitalisation.
- Be able to describe why information security is an important part of a digitalisation system and have an overall knowledge about how it can be implemented.
- Have practical experience, and be able to explain the complexity, by combining separate modules into a working system that solves a technical problem.
- Describe the challenges in developing a system that meets the customer needs. Both technically, organisational and administrative.
- Outline the contents in some of the social goals that impact the technology and the human interaction with technology, such as Agenda 2030.
- Outline the impact of standardisations, such as ISO and IETF, within the fields of the course.
- Outline the ecosystem based on open source.

Competences and skills
For a passing grade the student must

- Basic ability to identify the different blocks in a digitalisation system, and how known technical solutions can collaborate to give a functional complete solution.
- Ability to understand and describe solutions at different levels of abstraction -- both from an abstract and a practical point of view.
- Within a context be able to evaluate and motivate the choice of technical solutions, based on general and specific technical requirements and target groups.
- Have practical experience of carrying out a project through the phases needs' analysis, choice of solution, realisation and validation, and as such deliver a system that fulfills the customer's actual needs.
- Be able to develop and deliver technical solutions in collaboration with others.
- Be able to use a computer as a tool during education and working life, e.g. for documentation, mathematical calculations, automatisation, planning and coordination.
- Demonstrate ability that is needed to find solutions for a problem in an engineering way, e.g. through experiments with the material and the technology.
- Have practical experience of tools used in open source projects.
- Have practical experience in methods relevant for interaction design and system engineering.

Judgement and approach
For a passing grade the student must

- Be able to discuss the complexity in large digitalisation systems and compromises that can be done based on technical requirements (such as security, prestanda and robustness), as well as context and target group.
- Be able to recommend a user-centric approach in the development process.
- Be able to apply an engineering way to approach problems by working actively and showing an ability to carry out experiments with the technology and the material.
- Be able to identify their own need for increased knowledge in the relevant areas.

Contents

The course gives an introduction to digitalisation from a system centric view. Throughout the course the students are working with the building blocks from a larger system, e.g. by controlling and monitoring an attached unit, flows of data in different parts of the system, cloud storage, open source solutions, interaction design and information security. In the course the students work with programming tools, such as console and script programming to realise the components and merge to a complete solution. Methods for user centric system development are used where the work is continuously documented. It is also included to formulate and illustrate understandable instructions.

Theory and practice from the topics communication systems, computer science and interaction design is mixed in the same course. To a large extent, the theory studied in this course is on a basic level and is seen as a motivation for other more in depth courses in the programme.

The course is studied through lectures, exercises, laboratories and a project that describes and motivates the theory in this and following courses. Laboratories gives a practical perspective of implementation of technical modules, whereas the project gives a wider system view with both technical solutions and users in interaction.

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)
Assessment: Approved course requires approved laboratories, reflections, hand in problems and presentations. It also requires active participation in project meetings.

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: 0121. **Name:** Mandatory Parts Study Period 1.
Credits: 3. **Grading scale:** UG. **Assessment:** Approved mandatory parts in LP1
Code: 0221. **Name:** Mandatory Parts Study Period 2.
Credits: 4,5. **Grading scale:** UG. **Assessment:** Approved mandatory parts in LP2
Code: 0321. **Name:** Mandatory Parts Study Period 3.
Credits: 3. **Grading scale:** UG. **Assessment:** Approved mandatory parts in LP3
Code: 0421. **Name:** Mandatory Parts Study Period 4.
Credits: 4,5. **Grading scale:** UG. **Assessment:** Approved mandatory parts in LP4

Admission

The number of participants is limited to: No

Reading list

• TBD.

Contact and other information

Course coordinator: Paul Stankovski Wagner, paul.stankovski_wagner@eit.lth.se
Course homepage: https://www.eit.lth.se/course/EITA65

Further information: The course is given as a collaboration between the departments Electrical and Information Technology, Computer Science and Design Sciences.