Linnæus University

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# Course syllabus

Faculty of Technology
Department of Computer Science and Media Technology

## 2DT304 Projekt med inbyggda system, 7,5 högskolepoäng
## Project with Embedded System, 7.5 credits

**Main field of study**
Computer Engineering

**Subject Group**
Computer Science

**Level of classification**
First Level

**Progression**
G2F

**Date of Ratification**
Approved by Faculty of Technology 2020-06-13
The course syllabus is valid from autumn semester 2020

**Prerequisites**
Embedded Systems (1DT302), Computer Engineering (1DT301), Operating Systems (1DV512), and Networking (1DV701) or equivalent.

Finally, knowledge about advanced Software/Systems Engineering and Reliability in Embedded Systems (e.g. 2DT303) is recommended.

## Objectives
After completing the course, students should be able to:

- Design and develop non-trivial embedded systems fulfilling functional and non-functional requirements of specific applications.
- Master specific architectures and programming languages for embedded systems.
- Demonstrate ability to manage real-time scheduling and concurrency.
- Model and assess non-functional requirements like performance, reliability, safety and security for compliance and certification purposes.

## Content
In the course the students are supposed to develop and document a non-trivial Embedded Systems project. The project can be in the context of smart-systems, cyber-physical systems, Internet of Things, etc. The project must demonstrate the capacity of the student to address real-world application requirements.
Projects can be assigned by course coordinator or proposed by the students, subject to approval by course coordinator. Students can work individually or in groups. Students can leverage on devices and tools available in the lab for developing their projects.

## Type of Instruction

Teaching consists of course introduction explaining course objectives and organization, and student project supervision. All course materials and assignments are managed through the online learning platform. Attendance to any planned seminars and workshops is mandatory. Students will be regularly asked to present their current progress in project development.

## Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.
The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

At the end of the course, students will submit a report consisting of a written document showing structured system design and testing, plus any additional audio-visual materials demonstrating their achieved results. Students will be also required to provide a real operational demonstration of what they have developed. In cases where two or more students have done a joint report, the individual contributions must be assessed. A grading rubric will be provided to students explaining the main evaluation criteria.

Repeat examination is offered in accordance with Local regulations for courses and examination at the first and second-cycle level at Linnaeus University.

If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customised exam or to have the student conduct the exam in an alternative way.

## Course Evaluation

During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of the course. The course evaluation is to be carried out anonymously.

## Required Reading and Additional Study Material

Detailed information about study guidelines and extra course materials will be provided during the lectures and shared in learning platform classroom.

For the project, depending on the hardware and software platforms they will use, students are encouraged to find their own sources and study materials (books, technical papers, videos, etc.).

The following reference textbooks can be used as a starting point:
Edward A. Lee and Sanjit A. Seshia, Introduction to Embedded Systems, A Cyber-Physical Systems Approach, Second Edition, MIT Press, ISBN 978-0-262-53381-2, 2017

Peter Marwedel. . Embedded System Design: Embedded Systems, Foundations of Cyber-Physical Systems, and the Internet of Things (3rd ed.). Springer Publishing Company, Incorporated, ISBN 978-3-319-56045-8, 2017