Linnæus University

Jnr: 2019/1995-3.1.2.2

Course syllabus

Faculty of Technology

Department of Computer Science and Media Technology

1DT302 Inbyggda System, 7,5 högskolepoäng
Embedded Systems, 7.5 credits

Main field of study
Computer Science

Subject Group
Informatics/Computer and Systems Sciences

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved by Faculty of Technology 2019-06-10
The course syllabus is valid from spring semester 2020

Prerequisites
Knowledge about fundamentals of computer science, computer architecture / technology and programming languages (eg, 1DV004, 7.5 credits + 1DV507, 7.5 credits + 1DT301, 7.5 credits or equivalent).

Objectives

After completing the course, students should be able to:

- describe the characteristics and technologies of embedded systems in various applications
- describe and explain architectures and programming languages for embedded systems
- use the main real-time scheduling algorithms
- model concurrency in embedded systems
- describe and explain the main standards and certification activities for embedded systems

Content
The course covers the following topics:

- Basic definitions: Embedded Systems, Smart-Systems, Cyber-Physical Systems, Internet of Things
- Embedded Systems Classification and Applications
- Embedded Systems Architectures and Programming Languages
- Scheduling in Real-Time Embedded Systems
- Concurrency Models for Embedded Systems
- Embedded Systems Standards and Certification

Type of Instruction
Teaching consists of lectures, project work and assignments. All course materials and assignments are managed through learning platform.

Attendance is mandatory since weekly or biweekly assignments will be provided during lectures.

Hybrid/blended teaching models are used together with "flipped classroom".

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 is the lowest grade on the scale that will result in a pass. The grade F is that the student's performance is assessed as fail.

The assessment of student performance is made through the submission of papers.Students will be required to submit a paper before a given deadline and prepare a brief presentation to be held and discussed during the next lecture.

The final grade will be an average of the grades obtained in each assignment.

To pass the course, grade E or higher is required for all parts.

Students who do not pass the regular examinations will be offered retrials. Different modalities (eg, multiple answer written tests) may be used in case of retrials.

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 course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed.

Other
Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

The course is conducted in such a way that the course participants' experiences and

knowledge are made visible and developed. This means, for example, that we have an inclusive approach and strive for no one to feel excluded. This can be expressed in different ways in a course, for example by using the gender neutral example.

Required Reading and Additional Study Material

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

For the assignments, 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