Welcome to IL2206 Embedded Systems

Course Overview

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About the course responsible...

- Background
  - Professor in Electronic System Design
  - Languages (in that order): German, Swedish, English
- Research Interests
  - Embedded System Design Methodologies
  - Embedded System Architectures
  - Embedded Software
- Web Page
  - https://people.kth.se/~ingo/

Course Contents

- Main focus lies on design of embedded real-time systems
- Lectures focus on theoretical concepts
- Seminars focus on the design process
- Laboratory course supports selected theoretical concepts

Intended Learning Outcomes

- Having passed the course, the student should be able to
  - describe the fundamental structure of the platform for embedded computer systems and explain the cooperation between the software and the hardware components (ILO A)
  - analyse how architecture and implementation decisions influence the performance in an embedded system (ILO B)
  - use basic models and analytical methods for embedded realtime systems (ILO C)
  - develop software for simple embedded real time systems (ILO D)
- Examination
  - ILO A-C are examined in the written exam in individual parts
  - ILO D is examined in the seminars and laboratories

Course Requirements

- Grading system A-F
  - A-E (passed), F (failed)
- To pass the course the student has to fulfil the following requirements:
  - Complete the seminars and the labs and have them approved by the course assistant. Please note, that in order to attend the laboratories all preparation tasks have to be completed!
  - Pass the final exam. The grade for the exam will also be the grade of the course, assuming the labs and exercises have been completed as required.

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Course is on advanced level!

For many students, this course is maybe the first course at master level. Please check the qualitative targets (examensmål) for master programs in Sweden.

Course Staff

- Course Responsible and Examiner
  - Ingo Sander
- Lectures
  - Ingo Sander
- Laboratories
  - Rodolfo Jordao, Rui Chen, Fahimeh Bahrami, Thilanka Thilakasiri
- Seminars
  - Ingo Sander, Rodolfo Jordao, Rui Chen, Fahimeh Bahrami, Thilanka Thilakasiri

Course Structure

- 17 lectures including
  - Tutorial on laboratory environment
  - Exercises as part of the lectures
- 2 mandatory laboratories in 3 lab sessions
  - Students work together in groups of two. However each student has to understand all parts of the lab.
  - Each student has to individually complete the preparation tasks before the lab session!
  - There are several sessions for each laboratory
- 2 mandatory seminars
  - Students work alone
  - Each student has to individually complete the preparation tasks before the seminar session!
  - There are several sessions for each seminar

Work load

Expected average work load: 200 hours (7.5 hp)

Exams

- Exams (graded), please double-check dates!
  - Final exam: at end of period 1
  - Only one re-exam: at end of period 2 (before Christmas)
- Exam contains three parts A, B, C (individual part per intended learning outcome)
- All parts must be passed to pass the exam

Detailed Exam Information
More information in Canvas and the Course-PM

Laboratories

- A laboratory consists of 2 students
- Several sessions per lab
  - Register for a session in KTH Canvas
  - Each student has to register, i.e., lab partners must register for the same session.
  - Come to the session you registered for, otherwise you will neither be guaranteed a seat nor time with the lab assistant!
- Most of the laboratory is preparation, i.e., to be done before the lab session!
- Find a lab partner and start as soon as possible!

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Good individual preparation is required

1. Laboratories require significant preparation work!
2. Every student has to understand the full laboratory

Seminars

- Individual work
- Several sessions per seminar
  - Register for a session in KTH Canvas
  - Each student has to register for a seminar session
- Seminar has preparation tasks, which have to be completed in time
  1. reflection exercise
  2. feedback on reflection exercises

Virtual Machine and FPGA Boards

- DE2 FPGA-boards will be distributed later in the course to be used in laboratory 2
- A virtual machine (VM) will be used in the course for the software used in the labs
- Follow the instructions in Canvas to download the VM

Cheating and Plagiarism

Cheating and Plagiarism

Suspected cheating shall be directly reported by the teaching staff to report to the KTH president, which gives rise to a disciplinary matter with possible serious consequences for the student.

KTH Canvas

- We will use Canvas in the course. You can log in with your KTH id after you have been registered
- All questions to the course staff should be send via the KTH Canvas
- You can also use the KTH Canvas discussion forum between students
  - Students can help students and many small problems can be solved without consulting the teaching staff!

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Questions?

For questions, please use the discussion forum in Canvas!

Course Material

- The main reading material are the lecture notes, which are available via Canvas
- There is no textbook available that covers the material of course
- The course gives links to online resources (book chapters, industrial documentation, articles, . . .)
- Good knowledge of programming language C is required

Contact with Course Staff

- The lecturer is usually available for question during the break and up to 15 minutes after the lecture. Please use this time for questions.
- Before you send an e-mail, please check the course web page on KTH Canvas. Maybe there is already an answer to your question.
- If you anyhow feel, you need to send an e-mail
  - Please check that you send the e-mail to the right person or mail-list.
  - Use your KTH mail address so that we know that you are a KTH student.
  - Start the subject with "[IL2206] . . . " so that we know that is about the Embedded Systems course.
  - Please make sure that your e-mail has a very clear message. This will save a lot of time!

Changes due to Covid-19

- Due to Covid-19 restrictions apply and the course cannot be conducted in the same way as in previous years
  - Maximum number of students in a lecture room is restricted, and distance needs to be ensured!
  - New restrictions or regulations can arise due to Covid-19
- Initial plan for IL2206 Embedded Systems:
  - Lectures in the classroom with limited number of students and online-streaming
  - Seminars will be conducted online
  - Laboratory session 1 will be conducted online
  - Laboratory sessions 2 and 3 with well-defined schedule in smaller groups in class room
- We will continuously check, if this model can fulfil the restrictions due to Covid-19.
- Please cooperate and keep distance!

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Please follow these instructions to enable a safe study environment!

Before I forget...

- Read the course web page and the course-PM in Canvas
  - All important information is contained there
- Laboratory and seminar registration will open in a few days
  - Select a laboratory and seminar group for each lab session in Canvas

IL2212 Embedded Software

- Embedded Systems course should not be viewed in isolation
- Follow up-course: IL2212 Embedded Software
- Many software-related topics are discussed in that course!