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## Report - IL2212 - 2021-05-21

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Respondents: 1  
Answer Count: 1  
Answer Frequency: 100.00%

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Please note that there is only one respondent to this form: the person that performs the course analysis.

**Course analysis carried out by (name, e-mail):**

Ingo Sander, ingo@kth.se

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**DESCRIPTION OF THE COURSE EVALUATION PROCESS**

**Describe the course evaluation process. Describe how all students have been given the possibility to give their opinions on the course. Describe how aspects regarding gender, and disabled students are investigated.**

All students were invited to participate in the learning experience questionnaire (LEQ) of KTH with 12 questions. The LEQ summary also gives separate diagrams per gender, type of student, or disability. The LEQ gives also the opportunity to give free comments. In total 11 out of 45 students participated in the LEQ.

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**DESCRIPTION OF MEETINGS WITH STUDENTS**

**Describe which meetings that has been arranged with students during the course and after its completion. (The outcomes of these meetings should be reported under 7, below.)**

The students did not issue an interest for a course committee meeting. No course committee meeting was held this year, also caused by sick leave due to the pandemic. In the previous year and in this year's embedded system (IL2206) course, there have not been any volunteers although the teacher had reminded the students on a course committee meeting.

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**COURSE DESIGN**

**Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.**

The course is designed for about 50 students and given each year at the advanced level. The course consists of 15 lectures (2h), 2 seminars (2h) and 3 laboratory sessions (4h). To pass the course, both the written exam (grades: A-F), focusing on the theoretical aspects, and the laboratory course (grades: P,F) have to be passed.

The course focuses on the practical real-time aspects of multiprocessor embedded real-time systems. In normal years, the laboratory course is conducted as a project, where students have to implement a digital signal processing application on an embedded multiprocessor with given timing and memory constraints. The multiprocessor is provided as a soft-core, which will be downloaded onto an Altera FPGA board, which the students can borrow for the duration of the course. During the project students have also to hand in two written reports describing their design and its performance. The project is divided into three laboratory sessions with deliverables in each session.

However, due to the pandemic situation, the course design was changed, and the laboratory course was replaced by practical homework. Normally, the written exam determines also the grade of the course. Due to the pandemic another system with examination on theoretical and practical homework was used, with an optional oral exam for students who scored high marks and wanted to achieve the grades A or B.

The course was held remotely, with recorded lectures.

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### THE STUDENTS' WORKLOAD

#### **Does the students' workload correspond to the expected level (40 hours/1.5 credits)? If there is a significant deviation from the expected, what can be the reason?**

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According to the answers of the students in the learning environment questionnaire, the workload seems to be reasonable. Still, it seems that most students work in average 20 hours per week. However, there is a clear variety between the workload hours reported by the students.

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### THE STUDENTS' RESULTS

#### **How well have the students succeeded on the course? If there are significant differences compared to previous course offerings, what can be the reason?**

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Students perform well in this master course. It seems that the preceding IL2206 Embedded Systems course prepares them well for this course.

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### STUDENTS' ANSWERS TO OPEN QUESTIONS

#### **What does students say in response to the open questions?**

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It is very difficult to summarise the answers to the open questions. Many students pointed out that the course was well organised and had interested lectures, seminars and homework's. The lecture notes were seen as a positive addition to the course. In the pandemic situation, lectures, seminars and homework examinations have been remotely (with recorded lectures), which was seen as positive by the students. Some students did not like the new examination form.

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### SUMMARY OF STUDENTS' OPINIONS

#### **Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.**

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The KTH learning experience questionnaire has been used for the evaluation. The questionnaire has 12 questions, where students give marks from 1 (strongly disagree) via 4 (neutral) to 7 (strongly agree). The questions are grouped into the following three areas.

It seems that during this year, there were only minor differences regarding gender. Also, it is difficult to draw major conclusion here because only 11 students participated in the evaluation.

- Meaningfulness - emotional level (Questions 1-6)

The course received very high marks in this area. According to the evaluation, the course had stimulating tasks (Q1: 6.5), and has been challenging in a stimulating way (Q4: 6.5)

- Comprehensibility - cognitive level (Questions 7-16)

Also in this area, the course achieved very high marks in almost all questions (between 5.8 and 6.4), but there is an exception in question 12 (Q12: 4.3). The students viewed the course to have clear goals and a clear organisation (Q7: 6.4). They found the subject and the presentation very understandable (Q10: 6.0, Q11: 6.8). Students found that the course had a very good alignment between the learning activities and the intended learning outcomes (Q12: 5.8). However, students did put lower marks regarding the delivery of the feedback (Q15: 4.3). The assessment on the course has been regarded as fair and honest (Q16: 5.9).

- Manageability - instrumental level (Questions 17-22)

The course achieved in general very high marks (between 6.3 and 6.6) in this area, with a minor exception in question 21 (Q21: 5.3). Students regarded their background knowledge as sufficient (Q17: 6.5), could learn in a way that suited them (Q19: 6.3). They gave lower but still very positive marks on the possibility to collaborate and discuss with others (Q21: 5.3) and students found that they were able to get support when needed (Q22: 6.5).

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### OVERALL IMPRESSION

#### **Summarize the teachers' overall impressions of the course offering in relation to students' results and their evaluation of the course, as well as in relation to the changes implemented since last course offering.**

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The course seems to have run even in the pandemic very well and students also perform in general very well in the course. Also students find the course relevant and stimulating.

The measures taken during the pandemic seem to have been very suitable. Both seminars and theoretical and practical homework have been very successful and increased in the teacher's view the student's understanding of embedded software design process.

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#### **ANALYSIS**

**Is it possible to identify stronger and weaker areas in the learning environment based on the information you have gathered during the evaluation and analysis process? What can the reason for these be? Are there significant difference in experience between:**

- **students identifying as female and male?**
- **international and national students?**
- **students with or without disabilities?**

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It seems that the course has succeeded to create a stimulating and positive learning environment for the students. Thus, it seems that the course is well-designed from a student perspective. In my opinion, the inclusion of theoretical and practical homework examination has been very successfully. It should be analysed, if this structure should be kept even in coming non-pandemic years, where these parts could be even more stimulating if they can be executed as physical events at KTH. The lecture notes have been very useful to support this kind of learning environment.

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#### **PRIORITIZED COURSE DEVELOPMENT**

**What aspects of the course should be developed primarily? How can these aspects be developed in short and long term?**

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The course has worked very well during the pandemic. It seems that large parts of the new structure could even be kept in a non-pandemic situation. However, this requires a more careful further analysis, but seminars and homework examination would profit even more from the possibility to have physical meetings. Thus, course development should focus on how the new concepts developed during this pandemic year can be further improved to make use of the possibility to have physical meetings within the classrooms.

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