Report - IL2212 - 2022-06-15

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

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):

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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 9 out of 43 students participated in the LEQ.

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.)

A course committee meeting was held on April 26, where the course and possible improvements were discussed. Two students, the examiner, and two lab assistants participated in the meeting.

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 followed the same course design as in the previous 'pandemic' year. Thus, 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. A guest lecture with two industrial embedded software system designers has been added, which was seen very positive by the students.

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

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. The students in the course committee meeting expressed that the workload was reasonable and that the tasks were evenly distributed over the period.

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?

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

STUDENTS´ANSWERS TO OPEN QUESTIONS
What does students say in response to the open questions?

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 really liked the new form, which uses a continuous examination concept, while others like the idea of the written exam.

SUMMARY OF STUDENTS' OPINIONS
Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.

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 high marks in this area. According to the evaluation, the course had stimulating tasks (Q1: 5.7), and has been challenging in a stimulating way (Q4: 5.6).

- Comprehensibility - cognitive level (Questions 7-16)

Also in this area, the course achieved very high marks in almost all questions (between 5.8 and 6.8). The students viewed the course to have clear goals and a clear organisation (Q7: 5.8). They found the subject and the presentation very understandable (Q10: 6.3, Q11: 6.8). Students found that the course had a very good alignment between the learning activities and the intended learning outcomes (Q12: 6.8). Also, students put high marks regarding the delivery of the feedback (Q15: 5.9). The assessment on the course has been regarded as fair and honest (Q16: 6.0).

- Manageability - instrumental level (Questions 17-22)

The course achieved in general very high marks (between 6.4 and 6.8) in this area, with a minor exception in question 21 (Q21: 5.1). Students regarded their background knowledge as sufficient (Q17: 6.4), and could learn in a way that suited them (Q19: 6.6). They gave lower but still very positive marks on the possibility to collaborate and discuss with others (Q21: 5.1) and students found that they were able to get support when needed (Q22: 6.8).

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.

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 and have created a good learning environment based on continuous examination. 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.

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?

The course has now been given for two years in a row using a new course structure with continuous examination. From the learning environment, it seems that this alternative structure 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.

However, there is also another side of the coin, since the continuous examination during the course also requires a lot of effort of the teaching staff, which is very likely more than in the previous structure of the course. Further evaluation is required to see, if this structure can also be used in years, where there is no pandemic, or how the course structure can be adapted so that it becomes more scalable and does not require so many resources.

PRIORITIZED COURSE DEVELOPMENT
What aspects of the course should be developed primaily? How can these aspects be developed in short and long term?

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.

Since the workload on the course staff is high in the current structure, it is important to investigate how the course structure can be adapted so that it becomes more scalable and does not require so many resources.