Report - IL2206 - 2021-05-20

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 addition, a course committee meeting was offered, but there has been a lack of volunteering students.

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 offered, but there has been a lack of volunteering students. So, a course committee meeting could not be held after the course.

COURSE DESIGN
Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.
The course consists of 17 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 seminars were part of the laboratory course. The written exam determines also the grade of the course. The laboratory course focuses on the practical real-time aspects of embedded single-processor systems.

The introduction of seminars and new material in the form of lecture notes have been new in this course.For the seminars, the students had to answer open questions on embedded systems design, which where then discussed in two seminars.

The students borrow donated Altera FPGA boards, which they can use for the course. In the second laboratory, the students have to implement an application using a commercial real-time operating system (MicroC/OS-II). To finish the two laboratory tasks, three lab sessions are allocated. The course is the first one in the master program "Embedded Systems" with many international students. To support the students and to compensate for the different background of students in this course, we have developed a home laboratory, where students also have access to the full solutions.

The course has worked well in previous years. The course has been designed for around 100 students each year at the advanced level.

Due to the large laboratory part, the course requires a large number of laboratory assistants. This year we have used four PhD students to conduct the laboratory sessions.

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' 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. Some students were late with their laboratory assignments.

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 and laboratories. Most students liked the idea of the seminars, but gave also suggestions for improvement. The lecture notes were seen as a positive addition to the course. In the pandemic situation, classes and seminars have been held both in a lecture room and remote (with recordings), which was seen positive by the students.

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 22 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.

35 students participated in the questionnaire.

1. Meaningfulness - emotional level (Questions 1-6)

The course received very high marks in this area (between 5.7 and 6.2). According to the evaluation, students worked with very interesting issues (Q1: 6.2), and was challenging in a stimulating way (Q4: 5.7).

2. Comprehensibility - cognitive level (Questions 7-16)

Also in this area, the course achieved in general very high marks (between 5.7 and 6.2). Students viewed the course to have well-defined learning outcomes (Q7: 6.0). They found the subject and the presentation very understandable (Q10: 5.7, Q11: 6.1), where the understanding of key points had high priority (Q11: 5.9). The course furthermore was regarded to have a very good alignment between the learning activities and the intended learning outcomes (Q12: 6.0). Students are very satisfied with the delivery of the feedback (Q15: 6.0) and regarded the assessment on the course as fair and honest (Q16: 5.9).

3. Manageability - instrumental level (Questions 17-22)

The course achieved very high marks (between 5.6 and 6.2) in this area. Students regarded their background knowledge as sufficient (Q17: 6.1) and could learn in a way that suited them (Q19: 5.8). They liked that they could collaborate and discuss with others (Q21: 6.2) and the students found that they were able to get support when needed (Q22: 6.2).

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 run very well and students perform in general very well in the course. Also students find the course relevant and stimulating.

However, the course requires a lot of resources and effort from the teaching staff, because of the practical laboratories, where students can borrow FPGA hardware boards.

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?

It seems that the course has succeeded to create a stimulating and positive learning environment for the students. This in particular important, because IL2206 Embedded Systems is the first course in the KTH master program "Embedded Systems" with depending on the study year between 80 and 150 students, where the major part are international students, who have never studied at KTH before. The course seems to have a clear organisation and structure, which is well aligned with the intended learning outcomes. Students view that the subject is presented in a clear matter and the assessment of the course is fair.

According to the LEQ there has not been so much difference between the answers of (a) international students and Swedish students, and (b) between different genders. It is difficult to draw any conclusion of the answers from the LEQ on students with disabilities due to the low number of answers.

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

The prioritised course development will be on the seminars. The idea is to have smaller groups to improve the discussion between students.

The course responsible will concentrate on an improvement of the laboratory course, since the labs also require very large resources and effort from the teaching staff. We need to investigate how the laboratories can run more efficiently.