Report - IS1200 - 2021-04-16

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.
We have used the following method:

1. Course committee meetings. Two students volunteered to be part of the committee in the beginning of the course, one from CINTE and one from TCOMK. We had two meetings: one halfway through the course, and the other at the end of the course.
2. In the middle of the course, we performed a battery evaluation (a special form of mid-term evaluation). All students were asked to give feedback (pros and cons) using mentimeter during a lecture break. We then summarized all answers and presented a summary of the answers at the next lecture (and, published the summary on Canvas).
3. At the end of the course, we sent out the LEQ form to all students.
4. The students were encouraged to send emails directly to the course responsible and/or examiner with feedback.

We try to encourage students from different programs with different background to take part in the course committee. This year, we had one male and one female student in the committee.

To enable support for disabled students, we always inform (on Canvas) about where they can find more information about their rights (FUNKA).

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.)
We arranged two meetings during the course: one in the middle, and one at the end.

COURSE DESIGN
Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.
The course teaches the fundamentals of computer organization, including both software and hardware. The course is divided into 6 modules:
1. C and Assembly Programming
2. I/O Systems
3. Logic Design (only for IS1500 students, not for IS1200)
4. Processor Design
5. Memory Hierarchy
6. Parallel Processors and Programs
The course is divided into 2 LADOK parts: (i) Labs and home labs (4.5 hp), and (ii) Written Exam (3hp). There are in total 12 lectures, 5 exercise sessions, 4 seminars, 4 laboratory exercises, and one mini project. The course ends with a 5 hour written exam.

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?

It is clear from the comments that many students find the course quite challenging. The expected time investment for the course is 20 hours a week, and the LEQ diagram indicates that students spent between 3 and 41 hours per week. The majority is in the upper range (20 hours or more), but the response rate was, however, only 12.99%. Therefore, the statistical significance can be questioned.

We believe that the high workload experienced by many students is due to a combination of many factors:
1. The pandemic can be quite taxing for many students, since all teaching and examination now take place online.
2. Many students do not have sufficient prerequisite knowledge of programming, and computer use in general. As a result of the pandemic, this fact is aggravated, since the students now need to install and handle a lot of software on their personal computers; in pre-pandemic times, most students used the lab computers with all software preinstalled. This problem has also been reported and confirmed by our lab assistants.
3. The students are attending their first year at KTH, and many may not have adjusted fully to university studies yet. Combined with the high pace of this course (only one period), this can come as a shock to many.

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?

2017: 50% pass rate
2018: 60% pass rate
2019: 68% pass rate
2020: 62% pass rate
2021: 45% pass rate

Detailed statistics for this round (2021):
F: 55%, 114 students
Fx: 0%, 0 students
E: 27%, 57 students
D: 10%, 20 students
C: 6%, 12 students
B: 2%, 4 students
A: 0%, 1 students

The pass rate is significantly lower compared to previous years. In addition to the factors mentioned under "THE STUDENT'S WORKLOAD", our new improved exam system could also have affected this. With this exam system, the students take the exam as a quiz in Canvas, and the submitted answers are then automatically graded using our external framework. In particular, this allows for having real programming tasks at the exam, which are then graded automatically using MARS for MIPS and GCC for C (MARS and GCC are of course available to the students at the exam). As a result, it is impossible to pass the exam if you are not able to write and run MIPS and C programs (assisted by an assembler /compiler). This could be a possible reason for the lower pass rates this year. The exam system was, however, also used for IS1500 in January, and did not result in a significantly lower pass rate compared to previous IS1500 exams.

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

In general, the students are happy with the course content and teachers. The main problems students experienced were related to the pace of the course.

We had one extra question related to taking the course during the pandemic. Overall, the students were happy with how this was handled.

The best aspects of the course
+ Interesting topic
+ The project
+ The exam
+ Good and helpful teachers and assistants
+ The lectures, especially polls

What could be improved
- Reduce the amount of course work
- Some exam invigilators were very inexperienced.

Advice to future participants
* Study a lot
* Read the book
* Start with everything in time
* Do not miss exercises and lectures
* Use git/github for the labs and project
* Work together with other students

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

The average response to LEQ questions are lower overall compared to the previous course round. Judging by the students' comments, this is mainly because of the experienced increase in workload compared to previous years. All LEQ items are, however, still on the positive side (>4).

Summary of feedback from the battery evaluation
+ Good quality course structure, lectures, teachers, and/or slides (26 students)
+ The interaction/polls/chat is good (15 students)
+ Exercises and seminars provide a good way to learn (10 students)
- Too quick/heavy/time-consuming (30 students)
- Seminars should be removed, or it should be possible to get the bonus points without attending them (11 students)

Summary of feedback from the course committee meetings
+ Overall good course
+ Great teachers at exercise sessions
+ Virtual machine for exam worked great
- Many students do not have sufficient programming background
- Too much work required
- Exam invigilators were not properly prepared
- The exam format was a bit problematic with copying and pasting in Canvas

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 works well overall, and has been refined and matured significantly over the years. However, for this course round (2021), and also for the last course round (2020), we have noticed a clear increase in the number of complaints regarding the course workload. In addition to this, we have had to schedule large amounts of retake lab sessions for these two course rounds, because a large amount of students are not able to finish the labs during the ordinary lab sessions. This has not been an issue in previous years.

It is difficult to pinpoint the reason for this decline, and we believe it is rather a combination of many factors. We identify some possible factors under "THE STUDENTS' WORKLOAD" above. The pandemic is clearly a contributing factor for this course round, but the fact is that the last course round was given under normal circumstances (except for the exam), which indicates other problems as well.

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 strong areas in the learning environment are the teachers and lab assistants, the course material, and the course organization (in particular the Canvas structure). This also agrees with the student feedback from this and earlier course rounds in the LEQs, the battery evaluations, and the course committee meetings.

As mentioned before, a possible weak area that have been especially prominent for the two most recent course rounds is the high workload and stress experienced by students. Again, the reason for this decline is not obvious, and we (the lead teaching team involved in the course) do not believe we can do any major changes to reduce the workload without also modifying the intended learning outcomes. It is interesting that this has become a problem in IS1200 during the last two rounds, but not for IS1500 (the same course that we give for CDATE).

It is important to investigate the problem above for future course rounds. We believe that this is a problem that must be addressed by the PAs for the involved programs, and not something we can handle for this course in isolation.

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

As this course has been around for quite some time now, and is rather mature, we do not believe any major changes are required in the near future. In the long term, we of course need to modernize, since computer architecture is a field evolving rather quickly. For example, it looks like the hardware used for the labs will soon no longer be produced. This means we will eventually need to redevelop some of the labs with respect to new hardware. This is, hopefully, a couple of years away, however.

In the short term, we will continue to adjust parts of the course based on student (and teacher) feedback. In particular, we will work on improving our new Canvas exam framework with automatic grading further. We are also looking into a possible solution for using the lab software through a virtual machine running in the students' browsers together with KTH in Flemingsberg. This would reduce the amount of time that students need to spend installing software on their own computers, which is in particular a huge benefit when the course is given online. Finally, we are also looking to update the requirements for the mini project, since many students still find these rather unclear.

OTHER INFORMATION
Is there anything else you would like to add?

We (the teacher team) would like to thank the students and everyone involved in the course for their efforts and feedback. Please do not hesitate to send us emails at is1200@ict.kth.se if you have any further comments or suggestions.