



Report - IS1500 - 2021-02-08

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.

I offered the following means for students to give opinions and influence the course:

1) Student Course Committee (SV, kursnämnd): Students volunteer to be part of the course committee when the course starts and take on the role of being proxies for other students to give anonymous feedback on the course. I met the students on two occasions: once in the middle of the course and once in the end. This year, the student course committee was represented by one female and one male student, both from CLGYM (but also collected information from CDATE).

2) Battery Evaluation: Here, I offer an additional communication-channel to complement the course committee. The battery evaluation was performed half-way through the course and in an online format, where students could anonymously comments and feedback on what works well and what does not work well. After the battery evaluation is complete, I summarize the evaluation in four slides and present the battery evaluation during the subsequent lecture, including planned efforts on improving the course as a function of the student's feedback.

3) At the end of the course, the LEQ is uploaded and made visible for students on the course homepage.

4) I encourage students to send feedback directly to the course responsible.

This year, the student course committee was well-diversified, with both a female and a male student.

I support students with disabilities by informing and encouraging them to contact me through the Canvas homepage. Furthermore, I have recorded and video-edited all lectures in the course, which allows all students to study and go through the lecture multiple times at their own leisure.

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.)

Two meetings were arranged with the student course committee during the course. The first time is in the middle of the course, and the second time is near the end (just before the exam). Furthermore, a battery evaluation is performed in the middle of the course, which is online and anonymous. The battery evaluation (mid-term evaluation) summary is disseminated to the students during the lectures.



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
4. Processor Design
5. Memory Hierarchy
6. Parallel Processors and Programs

The course is divided into 3 LADOK parts:

1. Labs in logic design (1.5 hp)
2. Labs and home labs (4.5 hp)
3. Written Exam (3hp)

There are in total 14 lectures, 6 exercise sessions, 4 seminars, 6 laboratory exercises, and one mini-project. The course ends with a 5 hour written exam.

Covid-19: The most intrusive change to the course this year (compared to the previous year) has been subject to the constraints that the ongoing covid19 pandemic is posing. Consequently, I (and several TAs/Examinators in the course) put in a significant effort in making the course covid19-friendly. Some notable examples were:

- 1) Perform the entire course virtually using Zoom,
- 2) Revamp course lecture material (slides, etc.) and change/update it to better activate the students through quizzes, polls, chats, and (when time allowed) real-life demonstrations of course content,
- 3) Record and video edit all lectures to allow students to re-watch them at their own leisure,
- 4) Virtualize the entire exam, effectively allowing students to solve exam-questions more faithfully using a dedicated (specialized) virtual machine (rather than write source code on paper)

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?

Overall, according to the LEQ response diagrams, the average student spends between 6 and 20 hours per week on the course, where the top three responses are:

- 1) 21% of the students spent 12-14 hours/week (up from 13.0% in 2019)
- 2) 19.4% of the students spent 9-11 hours/week (down from 23.9% in 2019)
- 3) 16.1% of the students spent 6-8 hours/week (down from 26.1% in 2019)

We also see that the distribution is different this year from the previous year, with a shift in time the students spend on the course. The reason behind this shift is not yet understood, but one possible hypothesis is that this is the first time the course is held online, which can be taxing on both students and teachers. Furthermore, there was a delay (covid19-related) in supplying students with the Labbkits they use for the labs, which could also have influenced this time.

Overall, most students answer that the course is demanding (but fun) and that the time spent is motivated by the credits rewarded. One student noted that they felt inhibited by the poor organization of the other courses they read in parallel, which led to the student spending less time than they wanted on this course (since they really liked this course).



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?

This year, the distribution on the grades were the following:

Grade distribution:

F: 29%

Fx: 3%

E: 22% (Down from 34% in 2019)

D: 16% (Up from 13% in 2019)

C: 22% (Up from 14% in 2019)

B: 6% (down from 8% in 2019)

A: 2% (down from 10% in 2019)

Overall, 68% of the students passed the exam, which is slightly lower compared to the 79% from the previous year (2019). If students with Fx (3%) pass the exam, then the number of passed students this year would reach 71%, which is in-line with the 70% passed in 2018.

In total, 180 students wrote the exam. If we contrast the distribution to the one from 2019, then we see a reduction in the number of students awarded both A or B, but an increase in the number of students awarded C or D. The underlying reason for this is not yet fully understood. One possible explanation is the improved (but different) examination system, which allowed students to actually solve the exam questions on a secure virtual image rather than writing the solutions down on paper. Despite the dedicated test-session we had with the system and the students, perhaps the divergence from the conventional exam format shifted the distribution to the one we see today. Another reason could be that the course moved entirely to a virtual (online) format.

STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

There were two open questions. This is a compiled version of all answers without quotes.

1) QUESTION: What advice would you like to give to future participants?

- a) Seminars, exercises, and labs are all good ways to practice for exams,
- b) Attend the high-quality lectures as they are very rewarding and actively ask questions
- c) Do a project that you think is fun as you learn more,
- d) Start working/preparing the labs and the project early on

2) QUESTION: What is your experience in following the course at a distance?

- a) All worked well, including the examination,
- b) The recorded lectures were good and helped a lot
- c) Some trouble with video-quality when showing labs,
- d) Hard to meet with team-members

Overall the students thought that this was indisputably the best distance course they encountered this semester, which is rewarding to hear given the time I (Artur) and the IS1500 team devoted to improving it.



SUMMARY OF STUDENTS' OPINIONS

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

Overall, the students seem very happy with the course and how it was delivered, despite the added constraints by covid19.

Some of the strengths:

- 1) Most students praise and appreciate the lectures and how they were delivered, including the video recording of the lectures available offline,
- 2) Using Polls on the lectures were appreciated
- 3) The entire course structure was praised by students
- 4) The virtual exam was positively received by the students

Some of the weaknesses:

- 1) Lab kits were not delivered in time
- 2) More TAs are needed for labs. Also, some students experienced a variance in how tough the TAs were during examination.
- 3) The lectures can at times be hard, and an "I don't understand" option for the polls/quizzes would be good
- 4) Some students found it ambiguous on what was counted as an advanced project.

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.

Despite the difficulties of the ongoing pandemic and the attached labor in virtualizing the exam, we found that the course went well. We are very happy and fortunate to have received so much praise from the students with the course this (and other) year(s).

Several of the changes that I (Artur) implemented this year, such as recording of video lectures or polls/quizzes online, were well received. Also, the new exam infrastructure developed by the IS1500 team was well received by the students.



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?

General analysis of the diagrams:

The overall score was quite high, and the average score for the different questions ranged from 5.5 to 6.5. The lowest was question 7 on ILOs, which is analyzed in detail below.

Overall, there are no major differences between female and male students, albeit female students have given scores that are slightly lower than those given by men. The most notable difference was in the perceived sufficiency of background knowledge, where female students scored their background knowledge lower than male students. However, on average, all students scored their background knowledge above neutral.

There was no information about the type of student (international/national/etc.).

Interestingly, the score given by the students with disability rank higher than the score given by those without. This is an observation that we also saw in the previous (2019) incarnation of the course. Students with disabilities comment that it has been appreciated and worked very well with having the course virtual (rather than physical on campus), and that the virtual exam also worked well.

Detailed analysis of the diagrams:

A clear majority (90.6%) of the students perceived that they were working "... with interesting issues" and gave either the highest (60.9%) or the second highest (29.7%) score. The remaining students either weakly agreed (6.3%) or felt indifferent (3.1%). Not a single student disagreed with the statement.

Nearly all students (96.9%) concurred that the course was "... challenging in a stimulating way", with a majority strongly agreeing with said statement (62.5%). Among the motivation behind the score was the large degree of freedom in choosing a project and that the course was challenging but delivered in a good way. Two persons responded negatively, but there were no further comments as to why they disagreed with the statement.

More than half of the students (57.6%) thought that the intended learning outcomes (ILOs) helped them understand what they were expected to achieve. Interestingly, several (31.3%) students claimed indifference to the statement, commenting that they never really read the ILOs. This is valuable as I (Artur) might want to increase the visibility and/or lift the ILOs up in future revisions of the course.

A majority of the students award the highest (50.8%) or second-highest (27.0%) score on the question if they learned concrete examples they could related to. Some students (6.4%) answered negatively on this score, and one comment was that the "labs were hard ... did not have many good code examples." [Translation from Swedish], which might be something to increase in further versions of the course.

Similarly, nearly all students awarded the highest (54.7%) or second-highest (29.7%) score on the question of whether "understanding key concepts had high priority" in the course. There were no students that disagreed with the statement.

The majority of the students answered that the course activities (labs, seminars, lectures, etc.) helped them to achieve the ILOs effectively. This is particularly important as it ensures me (Artur) that the course moments constructively align to the ILOs, which is indeed the intention behind them. Three students disagreed with the statement, where one of the comments thought that the exam and the ILOs did not align.

Most students agreed that they were able to "...practice and received feedback without being graded" and appreciated labs/exercises/seminars and even old exams. However, eight students disagreed with this statement. One of the students commented that the distance-education was part of the problem, and another commented that they were not aware of when said statement took place. Perhaps for future incarnations of the course, I should put more emphasis on this statement.

A majority of the students (87.5%) agreed with "the assessment of the course was fair and honest", and out of these, many strongly supported this statement (65.6%). However, four students disagreed with this statement. Two students provided feedback on why they disagree, which is primarily because of the new and virtual examination that took place. In particular, one felt uneasy by the automatic grader and its assessment. This feedback encourages me to perhaps discuss more deeply about the new type of virtual examination that we are using and perhaps have the students familiarize themselves with the virtual environment earlier than what was allowed now.

A majority of the students (81.3%) agreed that their "...background knowledge was sufficient to follow the course". Seven students (11%) disagreed with the statement, where one of the comments was that the student had never used the C-language before. One student commented that the "level between students differ greatly" [Translation from Swedish], and some students from CLGYM seem to experience that their prior background is limited compared to students from CDATE. This is also something that we observed in the previous year (e.g., 2019).

Most students agree that "the course activities enabled me to learn in different ways", which is the intention behind the course and its different moments (labs/seminars/exercises/projects) and their respective active learning styles. Two students disagreed with this statement, but no comments were left.

The majority of the students (87.5%) concur with the statement that they were "...able to learn by collaborating and discussing with others". This is in line with many of the course moments that adopt active cooperative and collaborative learning, particularly when coupled with experiential learning (labs). Four students disagreed with the statement but left no other feedback. What is interesting is that the course going virtual did not noticeably affect this graph compared to last year (2019) when the course was held physically, which seems to point that collaborative learning as designed in the course materialize well even using the online format.

Finally, most (73.7%) students felt they were able "...to get support if ..." they needed it. Eight students (12.5%) disagreed with the statement, and one of the comments was the problem of installing the software needed for the labs. This is something that we are continuously and actively working with, and we maintain a list of remedies on the Canvas homepage for the most common errors we see students encounter.



PRIORITIZED COURSE DEVELOPMENT

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

The course received a revamp this year, which was driven by the required online format during the pandemic. All the lectures were augmented with polls and quizzes in an attempt to activate the students during the ~2 hour-long lectures. Similarly, the labs and exercises were ported to an online format. The exam, which typically is physical, was reformatted to allow the students to use the tools that they were exposed to during the course in order to solve exam problems, which required a significant effort into making exam questions, making the infrastructure, and making the virtual machine.

While the course content itself is very mature, and the labs/exercises/project/seminars are (and have been) very appreciated by students, I think that with respect to the pandemic and the new examination format, the process is very iterative. We have gained a lot of experience and know-how this year-- experience that we aspire to proactively apply in order to improve the overall virtual experience for the next-generation students should the pandemic situation demand it.

OTHER INFORMATION

Is there anything else you would like to add?

I want to thank all students for the invaluable feedback they have provided and that they are very welcome to drop me an email for any questions, comments, or suggestions (podobas@kth.se).

Since this is my first time being main lecturer and course responsible for a course, I would like to thank you for all the praise you have given me in this evaluation, and I intend to aspire to continue doing an "extremely good job" on delivering the content in the future.
