Course Analysis

IS1500

Computer Organization and Components (Datorteknik och Komponenter)

Quantitative Data

- Course code: IS1500
- Year: Fall 2017 (Periods 1 and 2)
- Credits: 9 hp
- Main programs: CINTE, TIDAB, TIEDB, TCOMK
- **Examiner:** David Broman
- **Course responsible:** David Broman
- Responsible for lectures: David Broman
- Number of students: 272 according to Canvas.
- Number of participants at the exam: 186 (may include retake students)
- Students that passed the first exam: 139 (75%)
- Students that have finished all parts of the course: see LADOK.

Course Summary

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.

Course Evaluation Methods

The course was evaluated in three ways:

- We performed a Muddy Cards evaluation in the middle of the course, where the students could on a voluntary basis answer anonymously on a sheet of paper what they thought was good with the course and what they thought should improved. The teacher then collected the information and gave feedback on the response at one of the following lectures.
- We formed a course evaluation group (kursnämnd) that consists of students and the examiner. One meeting was held in the middle of the course and another after the course.
- Course questionnaire using the KTH Social system. The course evaluation was performed after the course. The system sent out the questionnaire to 189 students. The answering frequency was 17%.

Changes from Previous Years

In the fall 2014, this course got a new examiner: David Broman. The last time the course was given was in the fall 2016. The major changes of the course this year, compared to before fall 2014 are the following:

- Completely new lectures (introduced in 2014)
- The course got completely new labs. Students in groups of two can borrow ChipKIT embedded boards and bring them home during the course (introduced in 2015)
- A new mini project where one or two students create a small project in C. Students chose the project topic on their own (introduced in 2015)
- New concept of seminars where students can get bonus points to the exam. The purpose of the seminars is to train the student on the more theoretical aspects of the course and prepare them for the written exam. The seminars are optional (introduced in 2015).
- Separation of basic and advanced projects. This means that students need to be good in both the practical parts (the project) and in the theory part (written exam) to be able to get the highest possible grades (A or B) (introduced in 2016)

Since the last time the course was given (fall 2016), only minor changes have been done in lecture notes, labs etc., but no major changes in the course structure.

Feedback from Students

The following section summarizes the most essential feedback that was received from the Muddy cards, the course evaluation group (kursnämnd), and via the course questionnaire form. The figures are taken from the web-based course evaluation.

Lectures and Organization

In general, it seems like the majority of the students liked the course very much. In particular, several students pointed out that they liked the course organization, both in general, and in Canvas in particular. Considering the following Figure 9 (from the LEQ student evaluation), it shows that most students, with a few exceptions, understood the main concepts.



According to Figure 8, it is clear that a significant portion of the students agreed that the organization of the course was clear. The course seems to be quite stable now, and only few improvements are needed every year.





Similar to previous years, some students think that they do not have enough background knowledge. We should also note that students come from different programs, with different programming knowledge.

One issue that some students mentioned is that they do not like that several lectures are scheduled the same day. We will try to improve this next year.

One thing that was discussed at the course evaluation committee meeting was the possibility to introduce short video lectures on difficult topics, as a complement to the ordinary lectures. This is a good idea and I plan to add a few video lectures the coming year.



Despite the fact that many students found that the course requires a lot of work, most students found that the course was challenging in a stimulating way. See Figure 4 .

Some students commented that some of the lab descriptions could become clearer. In particular, lab 2 about symbols.

ò

Response

+1

+2

+3

x

In summary, the majority of the students seem to be very happy with the organization and the lectures, and few changes are planned for next year.

-2

-3

-1

Exercises and Seminars

In general, the impression seems to be quite positive about the exercises and seminars. Several students say that they learned a lot during the seminars, and they encourage other students to attend these seminars.

A few students thought that the exercises where not very organized. We will discuss this at the next teacher meeting.

Labs

Several students are very positive concerning the labs, and say that they learn a lot in the labs also for the exam.

This year we got the comment again that some TAs examined the labs in different ways. We are continuously improving this and we can also note that the problem is less significant this year. I plan to discuss this in detail before the course starts next year.

In general, a large majority of the students found that the course was inclusive and had a good atmosphere (see Figure 6).



Mini Project

I received very few comments about the mini project. In general, the feedback is very positive. The main negative comment was that students thought it was hard to know what was counted as an advanced project, and what was counted as a basic project. I will try to improve the clarification on the website and also to be clearer at the lectures.

Examination

In general, most students were satisfied with the assessment and the examination (see Figure 16)



Some students said that they want the advanced project to give higher grades, not to be a requirement for higher grade. I understand this comment, but there is a clear pedagogical assessment goal to have this system. The point is that to get on of the highest grades (A or B) in the course, the student has to be good both theoretically (the exam) and practically (to do an advanced project).

Some student also thought that the exam was too massive and took too much time.

Course Literature

We receive only a few comments about the course literature, and these comments were very positive.

Learning Experience Questionnaire (LEQ)

The LEQ graphs shown below are part of the web-based course evaluation system. It clearly shows that the course is quite stable now, with a few variations over the years.



Results for fall 2015

Meaningfulness - emotional level

Stimulating tasks

1. I worked with interesting issues

Exploration and own experience

2. I explored parts of the subject on my own

3. I could learn by trying out my own ideas

Challenge

4. The course was challenging in a stimulating way

Belonging

5. I felt togetherness with other course participants

6. The atmosphere in the course was open and inclusive

Comprehensibility - cognitive level

Clear goals and organization

7. The learning objectives helped me understand what I was expected to achieve

8. I understood how the course was organized and what I was expected to do

Understanding of subject matter

- 9. I understood what the teachers were talking about
- 10. I could learn from concrete examples that I was able to relate to
- 11. Understanding of key concepts was given high priority

Constructive alignment

- 12. The course activities helped me to reach the learning objectives efficiently
- 13. I understood what I was expected to learn in order to get a particular grade

Feedback and security

- 14. I regularly received feedback that helped me see my progress
- 15. I could practice and receive feedback without any grading being done
- 16. The assessment on the course was fair and honest

Manageability - instrumental level

Sufficient background knowledge

17. My background knowledge was sufficient to follow the course

Time to reflect

18. I regularly spent time to reflect on what I learned

Variation and choices

- 19. I could learn in a way that suited me
- 20. I had opportunities to choose what I was going to do

Collaboration

21. I could learn by collaborating and discussing with others

Support 22. I could get support if I needed it