

Course Analysis

IS1500

Computer Organization and Components (Datorteknik och Komponenter)

Quantitative Data

- **Course code:** IS1500
- **Year:** Fall 2014 (Periods 1 and 2)
- **Credits:** 9 hp
- **Main programs:** CDATE and CLGYM
- **Examiner:** David Broman
- **Course responsible:** David Broman and Fredrik Lundevall
- **Responsible for lectures:** David Broman
- **Responsible for labs and exercises:** Fredrik Lundevall
- **Number of students (in Daisy):** 253 participants (239 active)
- **Number of participants at the first exam:** 153 participants,
- **Students that passed the first exam:** 86 (55,8%)¹
- **Students that have finished all parts of the course (reported into LADOK 2015-02-24):** 74

Course Summary

The course teaches the fundamentals of computer organization that includes both software and hardware. The course is divided into 6 modules:

1. Logic Design
2. C and Assembly Programming
3. Processor Design
4. Memory Hierarchy
5. I/O Systems
6. Parallel Processors and Programs

The course is divided into 3 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 12 lectures, 12 exercise sessions, 4 laboratory exercises, and 2 take home laboratory exercises. The course ends with a 5 hour written exam.

¹ The students that were registered and reported to LADOK according to the time of the report (February 24, 2015). Of the students that received FX, two students had not done their complementary exam when this report was written.

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 consisted of three students and the examiner. One meeting was held in the middle of the course and another after the course. At the second meeting, only one student attended the meeting, but the other two students provided comprehensive feedback via email after the meeting.
- Course questionnaire using the KTH Social system. The course evaluation was performed after the course. The system sent out the questionnaire to 187 students. The answering frequency was 28%.

Changes from Previous Year

In the fall 2014, this course got a new examiner, David Broman. The major changes of the course this year, compared to previous years, are the following:

- The course got a new structure, consisting of the six modules described above.
- All lectures where redesigned, including organization and lecture slides. In particular, these lectures now emphasize the interaction between the teacher and the students.
- One of the home labs was removed.
- An optional quiz was introduced in the middle of the course.
- New exercises were introduced for the module Parallel Processors and Programs.

Feedback from Students

The following bullet items summarize the most essential feedback that was received from the Muddy cards, the course evaluation group (kursnämnd), and via the course questionnaire form.

Lectures

- + Most students reported that they really liked the new lectures. In particular, we received many positive comments about the interactive aspects of the lectures, including the small exercises.
- + Many students think that the lecture slides are very good and informative.
- - A few students think that there is too much information on the slides.
- + Several students appreciate that the slides are on the web.
- - A few students think that the reading instructions were not clear.
- - At the Muddy card evaluation, quite a number of students report that that the lectures had a too high pace, that too much information was covered in the lecture.
- + According to the course evaluation meeting, the teacher at the lecture was very appreciated. In particular, the students expressed that the teacher was very engaged in the teaching.

Exercises

- + Many students appreciated the exercises and gave good comments about the teachers.
- - A few students did not appreciate the exercises, stating that they did not contribute very much.

Labs

- + The labs were in general very appreciated. Many students report that they have learned a lot in the labs.
- - Many students report that they think that the workload for the labs were too high.
- - Some students comment that the lab instructions were hard to follow.
- - There were a few comments that the connections between lectures and labs are not very clear.
- - Some students commented that it was not so good that the lab preparations had to be done at school.
- - Many students complained about the software that was used in the labs.

- - Some students said that it was not good that the labs were using the instruction set architecture NIOS II, whereas the lectures and the book are using MIPS.
- - Many students disliked that the Windows lab rooms were used for the labs since it was very hard for the students to get a time slot there to prepare the labs.
- - The lab hours (17-21) were not very appreciated.
- - Many students felt that they were stressed before the lab exams because they felt that they only had one attempt to pass.
- - There have been some complaints that some laboratory assistants are harder (more strict) when examining students than others.
- + Some students have commented that the cache home lab was really good.
- - Some students said that it was hard to get help if they were stuck in the preparations of the labs.
- - Some students complained that there was a lot of waiting time during the labs.

Organization

- + Some students have commented that they liked the structure of the course and how it was divided into modules.
- - Some students thought that the course was pretty comprehensive and that it was hard to find the time to study between the lectures.

Examination

- - There were quite a lot of complaints on the written exam. In particular, students seem to dislike true/false/don't know questions and the fact that one could get minus points when guessing.
- + Except for the true/false questions, other questions were, according to the course evaluation meeting, appreciated.
- - Some students thought it was confusing to have NIOS at the labs and then MIPS at the exam.
- - Many students commented that the exam was quite hard and challenging.
- There have been many requests for bonus points for the exam.
- - Some students commented that the workload was too high for a 3hp course.
- - A few students stated that the advanced part of the exam was very time consuming.

Course Literature

- We did not get so many comments about the course literature. The only thing that was mentioned at the course evolution meeting was that the book did not strongly relate to the labs.

Analysis and Response from the Responsible Teachers

Lectures

We are very happy that most students seem to really appreciate the new lectures and especially that many students say that the interactive parts of the lectures are good. A few students think that there is too much information on the slides. We can understand this; the reason is, however, that we are trying to make the slides accessible even after the lecture. There are also a few comments about the reading instructions. We do not believe that there should be detailed reading instructions for a course at the university level. It should be enough with high-level guidelines about which chapters to read. Finally, many students reported that the lectures had too high pace. This is something that we will try to improve for the next year, so that more students can follow along the lectures.

Exercises

It seems that some students appreciate the exercises and some do not. In general, the exercises are now designed as a preparation step for the labs. We plan to do some changes for the exercises next year. In particular, we plan to have exercises that the students do individually during the course and that can give bonus points to the exam.

Labs

The labs are very appreciated, but there are also quite a number of comments about them. In particular, students seem to think that the labs require a lot of work. There are also quite a lot of comments about the hardware and that we are not using the same hardware on the labs and in the lectures. We plan to change this for the next time the course is given. In particular, we will try to use the same instruction set architecture (ISA) on both the labs and the lectures. We will also try to schedule the labs in other rooms than the Windows lab rooms.

Organization

In general, most students seem to like the structure. The main overall criticism we get is that the course is big and contains a lot of material. Now, when we are creating the new labs for a new hardware platform, we will try to find a good solution when it comes to work load.

Examination

There are a lot of comments on the examination, especially on the written exam. The main thing that is criticized is the true/false questions. The reason for why we introduced this kind of questions is that we would like to reduce the time spent on the fundamental part, so there is enough time to do the advanced part. The reason

for having minus points is to avoid that students guess on the true/false questions. However, since we have received so much feedback on this particular issue, we plan to mitigate the impact of this kind of questions now on the retake exam, and instead have short traditional questions on the fundamentals part of the exam.

Also, we plan to introduce bonus points in the examination. It is not decided yet how this will be done, but if it is implemented, it will be part of the course in the fall 2015.

Course Literature

We did not get many comments about the course book. Hence, it is hard to know if people liked the book, or if the problem is that few students actually read the book. We plan to partially change the course book for the fall, not because that the current book is bad, but rather that there are some other books that are better in some aspects.