Course Analysis

IS1500
Computer Organization and Components
(Datorteknik och Komponenter)

Quantitative Data

- **Course code:** IS1500
- **Year:** Fall 2015 (Periods 1 and 2)
- **Credits:** 9 hp
- **Main programs:** CDATE and CLGYM
- **Examiner:** David Broman
- **Course responsible:** David Broman
- **Number of students (in Daisy):** 217
- **Number of participants at the first exam:** 180 participants,
- **Students that passed the first exam:** 123 (68%)[1]

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, 5 exercise sessions, 3 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 be 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 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 188 students. The answering frequency was 38%.

Changes from Previous Year

In the fall 2014, this course got a new examiner: David Broman. The last time the course was given for IS1500 students was in the fall 2014. The major changes of the course this year, compared to previous years, are the following:

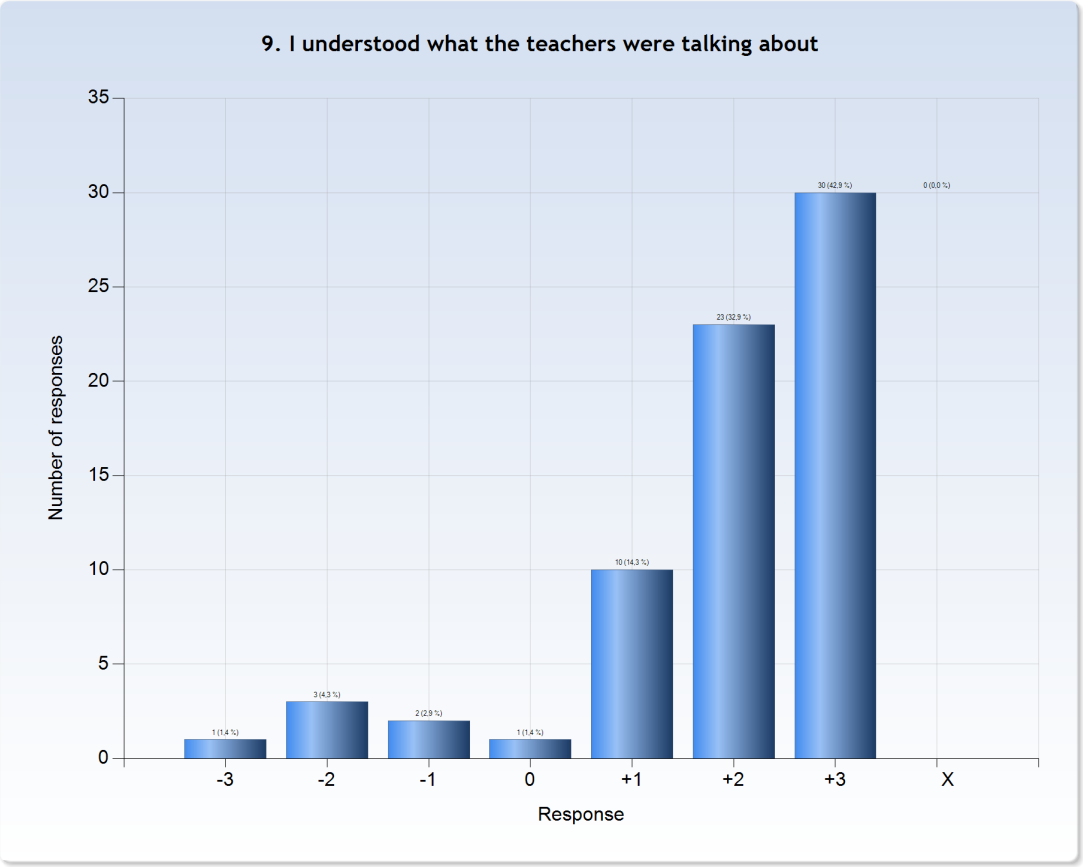
- The course got completely new labs. Students in groups of two can borrow ChipKIT embedded boards and bring them home during the course.
- A new mini project where one or two students create a small project in C. Students chose the project topic on their own.
- New concept of seminars where students 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.

Feedback and Analysis

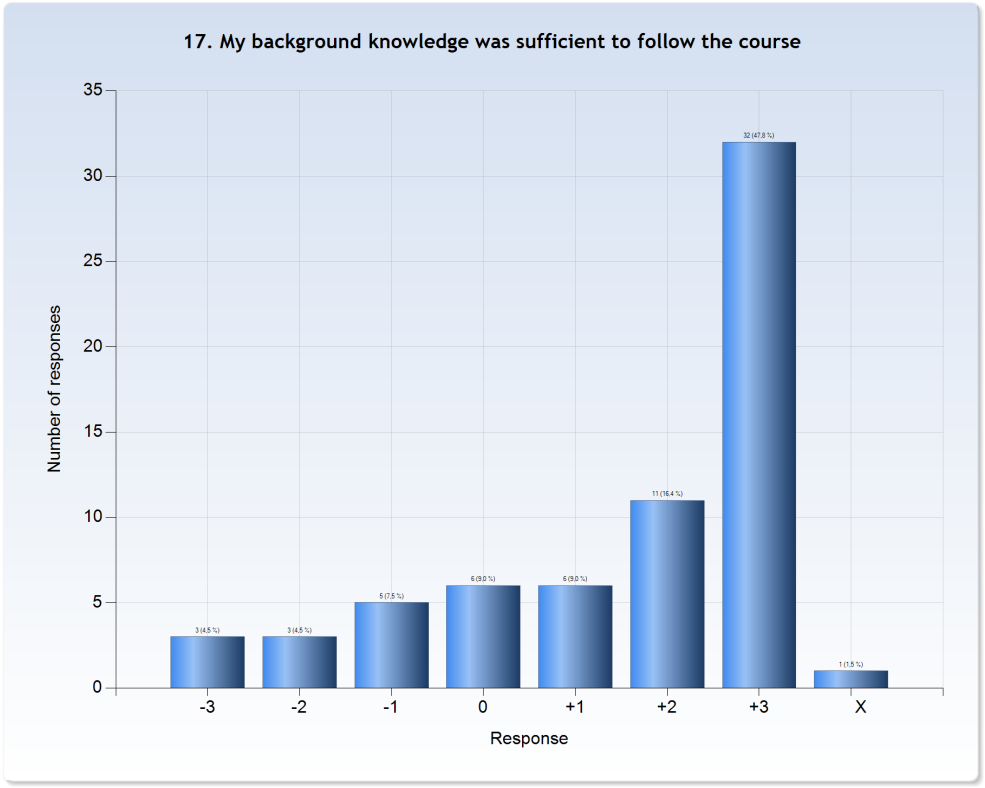
The following section summarizes the most essential feedback that was received from the Muddy cards, the course evaluation group (kursnämnd), and via the course questionnaire form. The figures are taken from the web-based course evaluation.

Lectures and Organization

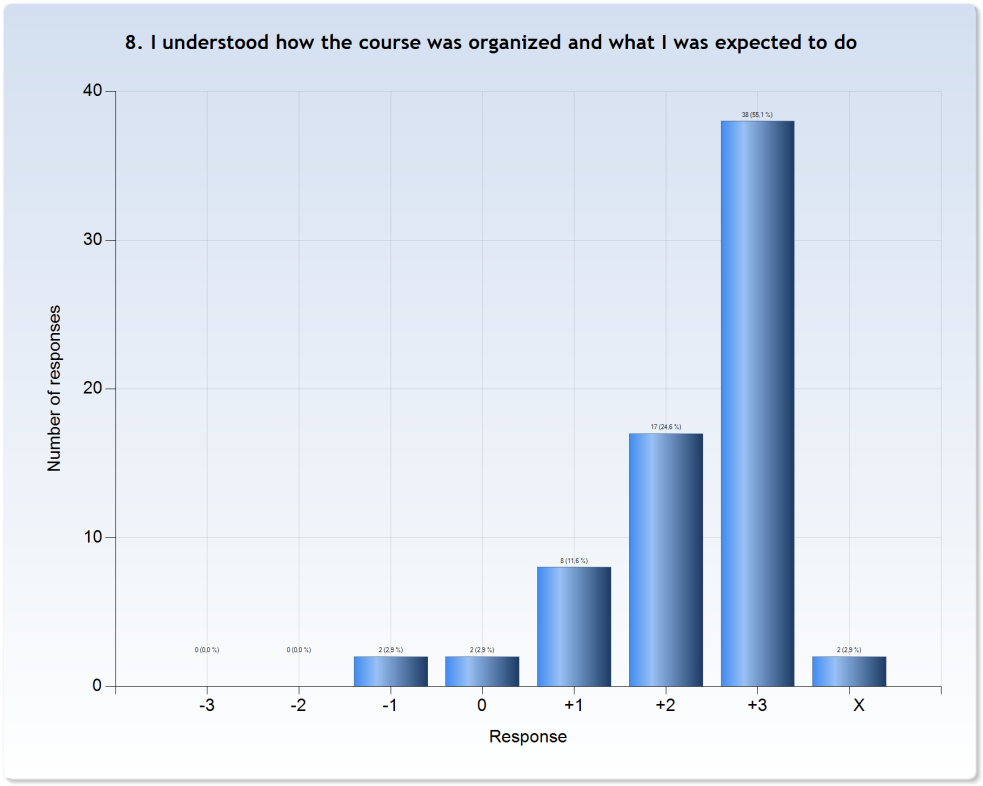
Most students were very happy with the lectures, both the presentation, and the slides. Several students stated that this course was the best course that they have every studied, both at KTH and at other universities. We are really happy to hear that! Other positive aspects that were mentioned were the engagement from the teachers and the teaching assistants. The following response shows that most students understood the teachers.



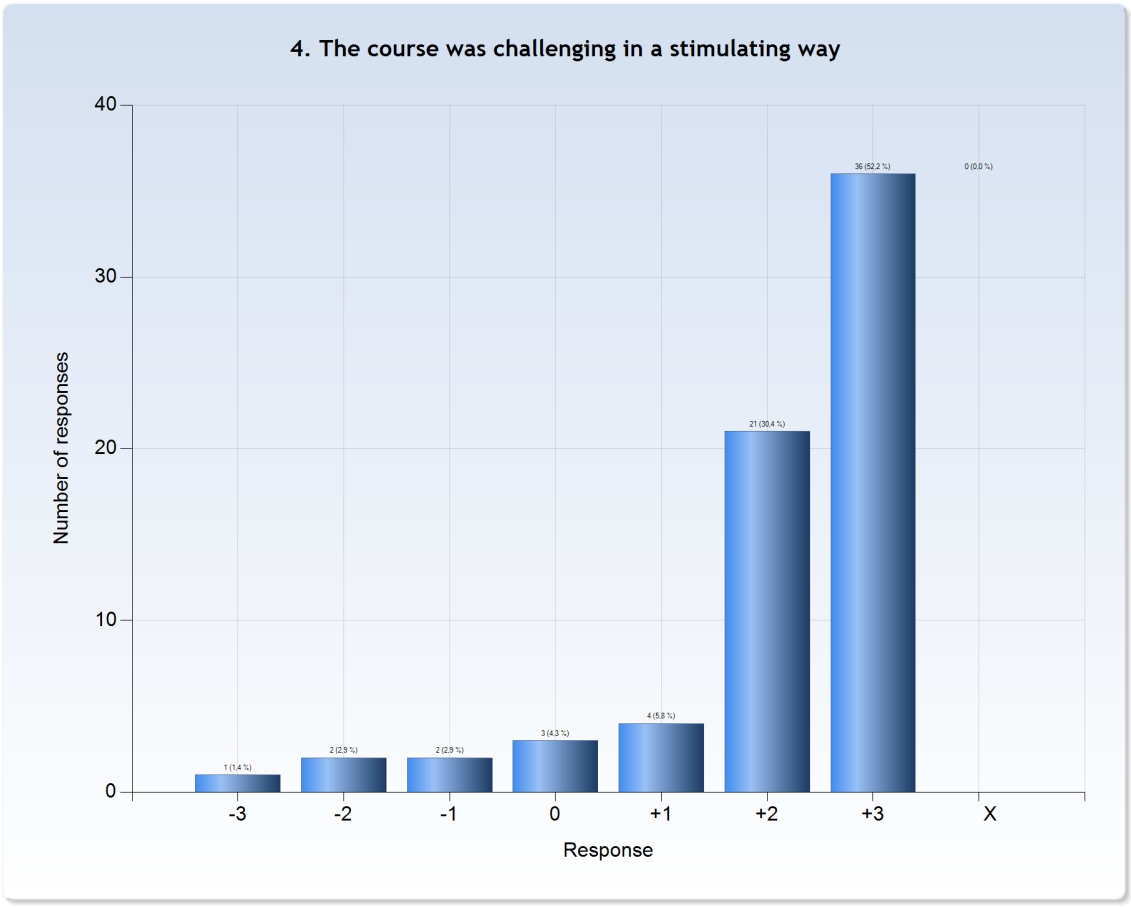
Some students found the subject very hard and that they did not have enough background knowledge to take the course (see the left part of the diagram above). In particular, students studying CLGYM stated that their background was not enough and that they found the course hard to follow.
Looking at the following graph, we see, however, that most students found that their background knowledge was enough. Unfortunately, the graph does not show the distribution between different programs.



In general, students were very happy with the organization of the course.



Many students expressed that the course was very challenging and time consuming. However, at the course evaluation meeting (kursnämnd), the students said that the level was good compared other courses. We should also mention that unfortunately no students from CLGYM volunteered and took part in the evaluation committee. The following graph shows that most students found the course challenging in a stimulating way.



Exercises and Seminars

Many students expressed that the new seminars were very good, but several students complained that they thought that not enough bonus points were given at the exam. We would therefore like to stress that the main purpose of the seminars is the learning perspective, which will help the student to take the exam, not the bonus points themselves. This is also clear, since a strong majority of the student that passed the exam also handed in seminar exercises. There were not so many comments about the exercises.

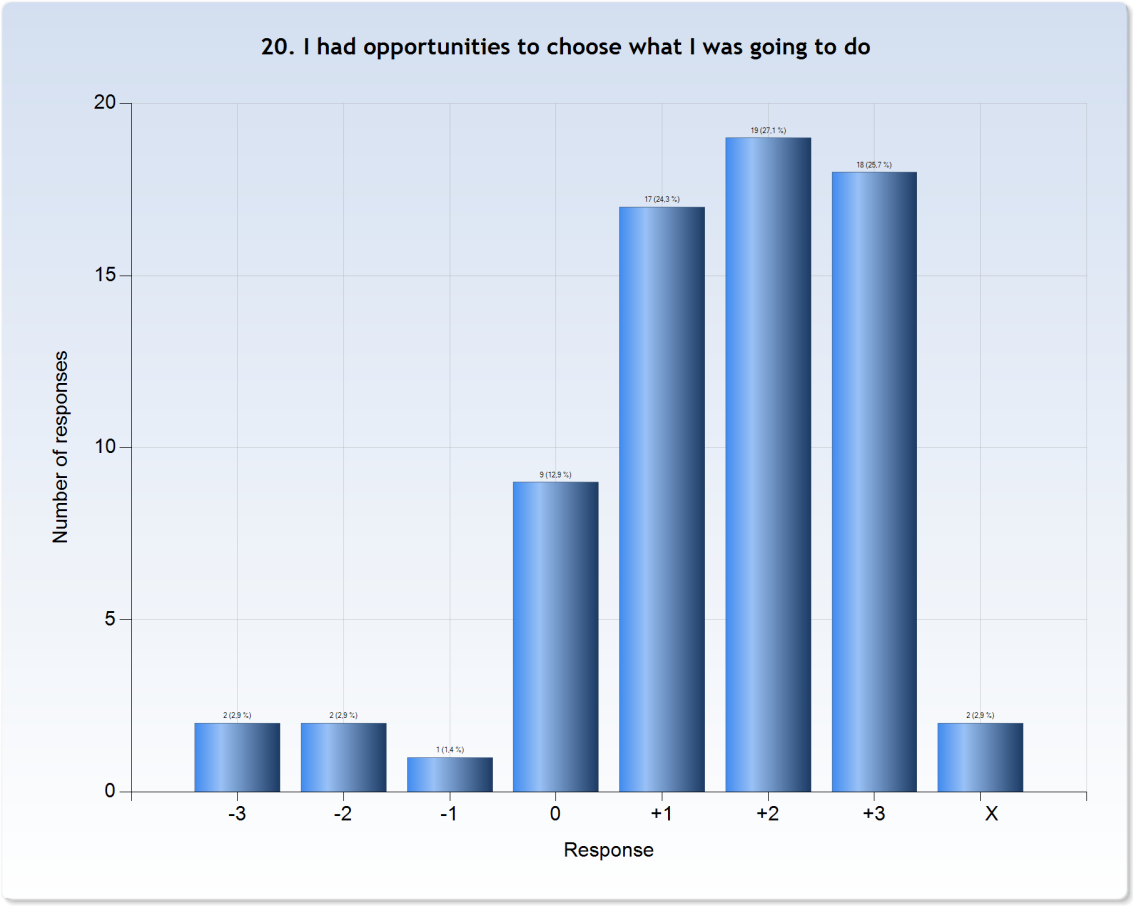
Labs

Many students stated that the labs were challenging, but that you learned a lot. Also, many students stressed the importance of starting to work on the labs early before the deadline. The main complains about the lab was the waiting time at the lab occasions. We are aware of this problem and we are trying to find solutions, but it is hard because of limited resources and the large number of students that are taking

this course. There were also some comments that some teaching assistants were "harder" than others. We have worked on this and tried to synchronize the assistants better and we hope that this will be better next year. Besides from the above, many students were very positive about the new labs.

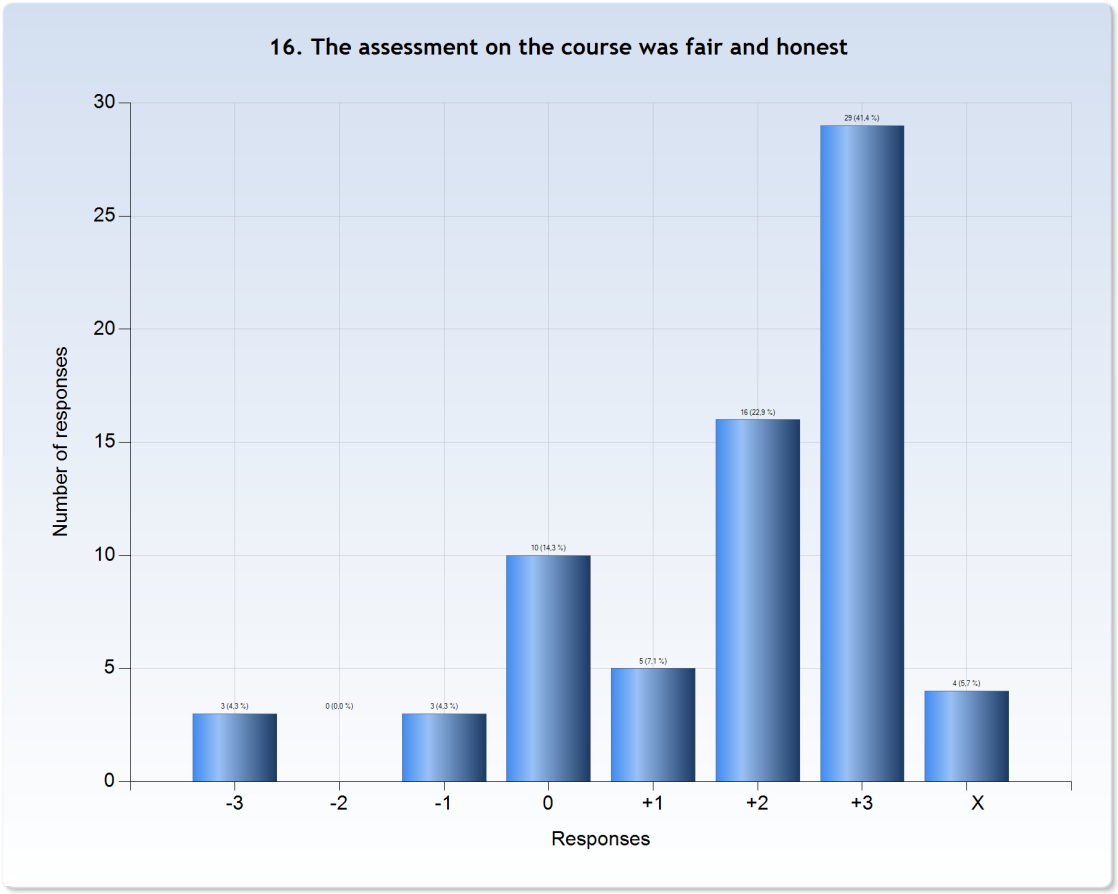
Mini Project

The mini project was new for this year. Many students were very positive about the project and said that they learned a lot. There were some complains about the information and requirements for passing the project. We intend to improve this for next year. In particular, we noticed that many students liked the fact that they could chose the topic of the project themselves, which is shown in the following graph. We can see a clear improvement on this question compared to last year.



Examination

Most students found that exam fair and there were very few negative comments about the exam. See the following graph.



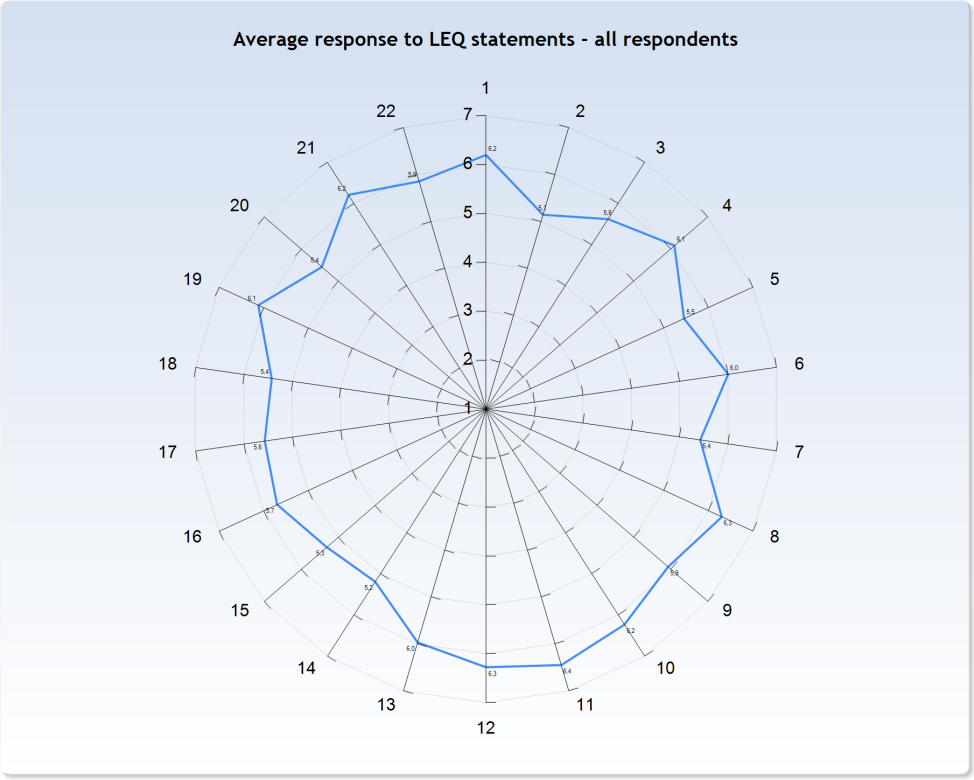
This is a significant improvement compared to last year, when many students did not like the exam. One possible reason for the improvement is that we removed the way we stated multiple-choice questions on the exam. We should also note that we increased the number of students that passed the exam this year. In 2015, 56% of the student passed the first exam, whereas 68% of the students passed the exam this year.

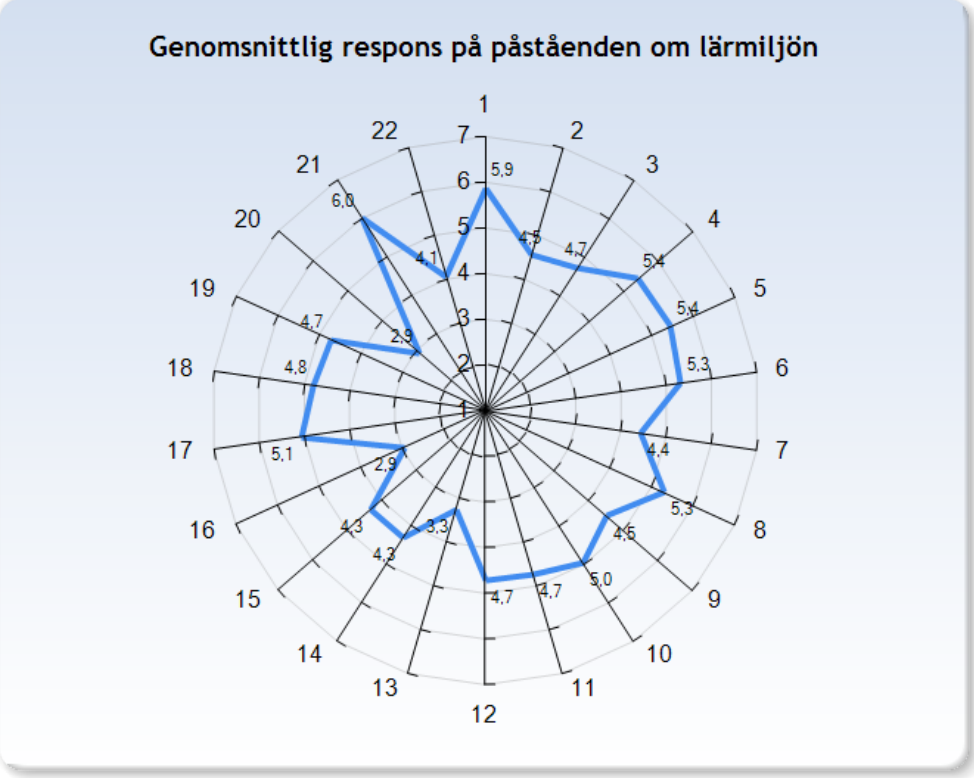
Course Literature

We received very few comments on the course literature, but the comments that we got were very positive. Some students especially expressed that they liked the reading guidelines that were provided on the course webpage. We introduced a new course book this year (Harris and Harris). At a poll during one of the lectures, it was clear that many more students have opened the book this year and actually read parts of the course book.

Learning Experience Questionnaire (LEQ)

The LEQ graphs shown below are part of the web-based course evaluation system. The first graph shows the results for 2015 and the second graph for 2014.





It is interesting to see that we have made significant improvements for the course in most of the aspects. Below, you can find the questions for each of the numbers. We can note that we have received significant improvements on questions 13, 16, 20, and 22. This shows that the students are much more satisfied with grading, the written exam, and their opportunity to learn.

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

Advice from Students

In the following, we have copied and pasted some of the comments that students gave anonymously on the question “What advice would you like to give to future course participants?”. Most answers were given in Swedish.

“Gå på alla föreläsningarna, de var väldigt givande. ”

“Tänk efter noggrant både innan och under labbarna och försök komma ihåg vad du gjort även efteråt. De är ett bra sätt att lära sig saker som kommer komma på tentan.”

“Läs boken och gå på föreläsningarna!! Gör det bara. Det ger sååååå mycket “

“Gör labbarna och gå på föreläsningarna. Dem är väldigt informativa och bra! “

“Börja tidigt med labbarna.”

“N J U T. Ligg i fas. Gå på alla föreläsningar! ”

“Om inställningen på labbarna redan från början är att visa att man kan det, då är det bra, men man ska inte vara orolig för att labbassarna rättar en om man säger saker konstigt eller felaktigt, för i slutändan så gör de det endast för en själv. Viktig sak att inse. ”

“Gå på föreläsningarna. Gör labbarna i ordning och i tid. Börja i tid med projektet”

“Läs kurslitteraturen, den återspeglar kursen väldigt bra och är till stor hjälp både till tenta och labbar. “

“Läs boken! Kursen följer verkligen boken och boken är riktigt bra!”

“Gå på alla föreläsningar, luta dig tillbaka och "enjoy the ride". ”

“Gå på alla föreläsningar, övningar och seminarier. Det blir då mycket, mycket lättare att klara labbarna och tentan. Ett tips för att klara labbarna är också att kolla på power points från föreläsningarna samt övningsuppgifterna för att lista ut hur problem ska lösas.”

“Ta vara på de reading guidelines som finns. Läs slidsen innan varje föreläsning. Börja med labbarna i god tid och boka en tidig redovisningstid, då får man redovisa fort och sparar tid för annat. Gå på seminarierna även om man får väldigt lite poäng. Det lönar sig att bara få lite praktiska räkneexempel emellanåt.”

“Kursen förutsätter att du gör ansträngningen som krävs för att lära sig hela kursinnehållet i detalj. Det är kursens både stora utmaning och belöning. ”

“Följ David Bromans instruktioner om studietips ("General Study Advice"), det är ett bra sätt att hänga med och förstå allt i kursen.”

“Dokumentera varje modul i kursen på egen hand efter att den avslutas i kursen och plugga sedan på varje modul för sig inför tentan. “

“Jobba kontinuerligt, kom ihåg att det är kul! “