



Fakulteten för hälsa, natur- och teknikvetenskap

Kursanalys

Kursanalysen ska genomföras inom 3 veckor efter avslutad kurs. Lämnas till prefekt eller den som prefekt delegerar till.

OBS: pga av problem med labbarna (och annat), en delanalys gjordes i februari 2014. Slutanalysen (denna version) gjordes 140401 efter att labbarna hade rättats och analyserats.

OBS! För kurser inom lärarutbildningen och läraryftet används speciellt framtagna enkäter. Administreras av lärarutbildningen kansli.

Datum 140204			
Kurs Datastrukturer och algoritmer		Hp 7,5	Kurskod DVGB03
Programkurs	Termin i program	Kursdatum/läsperiod <i>HT2013 / LP 5</i>	
<ul style="list-style-type: none">○ Study Programme in IT Design: Software Design (Year of study: 2)○ Engineering: Computer Engineering (Year of study: 3)○ Engineering: Industrial Engineering and Management-Computer Engineering (Year of study: 3)○ Engineering: Industrial Engineering and Management (Year of study: 3)○ Computer Science (Year of study: 2)○ Geographic Information Systems Engineering (Year of study: 3)○ Engineering: Surveying Technology and Geographical IT (Year of study: 3)	3 / 5 / 5 / 5 / 3 / 5 / 5 resp.		
Fristående kurs...X ...			
Uppdragsutbildning..... Sätt kryss!			
Antal registrerade på kurs 58		Antal besvarade kursvärderingsenkäter/deltagande vid muntlig kursutvärdering 10	
Hst	Hpr (efter 1 tentatillfälle)	Genomströmning (%) 33% (ordinatietenta) 25% (helkurs)	Har kursens mål examinerats? Ja

Förändringar till detta kurstillfälle

Förändringar som planerats och genomförts sedan föregående kurstillfälles kursanalys

Inga

Detta kurstillfälle, uppföljning

Studenternas synpunkter och sammanfattning av resultatet från kursvärdering (enkät samt ev muntlig):

Number of respondents: 10 It's Learning enkät

1. Multiple choice question

Percentage

How do you perceive the quality of the course as a whole?

Very low	20%
Low	20%
Acceptable	30%
High	30%
Very high	0%

2. Multiple choice question

Percentage

How do you perceive your own workload during the course?

Very low	0%
Low	0%
Acceptable	0%
High	40%
Very high	60%

3. Open question

What was, according to you, the best aspects of the course?

- A very competent teacher with a fresh and new curriculum (studiegång) wow, now that's a word. By removing the course book and relying on internet sources is a good thing.
- Bra lärare, bra material
- Honestly, I can't say there have been any "best" scenario during the course.
The only thing I can see as positive is that we received an open letter from the teacher, too bad we received when the course almost was over.
- Utmanande laborationer.

Lärarens kunskapsnivå och arbetserfarenhet.

- Föreläsningarna var bäst. Bra redovisning och förklarar ingående och bra.
- The lab's were very good for learning but they were also very time demanding so we did not have any time left for theoretical studies or other course's subjects.

Overall I like the subject's of this course and most of them were interesting.

- Interesting topic.
- Labbarna var mycket lärorika även om de tog väldigt mycket tid.
- Kursens innehåll känns väldigt relevant.
- Mycket bra innehåll.

4. Open question

What was, according to you, the worst aspects of the course?

- You must succeed on the toughest lab to even have a chance on two others...
- För stora labbar
Att allt beror på 1 labb är det som stör mig mest
- As I've heard, there has been problems with this course before. So for me It's very strange that the course fails so hard this time!
This might be the first course during my 1,5 years on the university where I've haven't been able to receive any kind of new knowledge.
Why? I think there has been a huge miss in communication and relation between student and teacher. The huge problems people occurred in the first lab ended up with an enormous loss of motivation, engineers and IT-designers.
Personally I'm deeply concerned for my own studies, as this course is required to keep moving on.
And if I would be the manager of this course I would pretty worried over the situation itself.
I agree that you can blame the students, IF there was a certain amount of students complaining. BUT when almost all of them says that "this haven't been done right", the responsible should give this case a moment and try to make the best out of the situation and reply this to the students. An open letter is a nice try, but honestly It will at least not change my opinion about this course.
- Föreläsningarna var otydliga och gav inte så bra kunskapsgrund inför laborationerna, utan istället behövde man söka kunskapen på annat håll(internet, dvs).

Laborationerna var förvisso utmanande och handlade om intressanta ämnen, men hade otydliga specifikationer och det kändes i stor mån som man behövde gissa sig fram med vad som önskades.

Kompendiet och wikisidan verkar vara ett ambitiöst projekt, men wikisidan var svårnavigerad och ofta var det tunt med relevant information när man väl hittade den sidan man sökte.

- Labbarna, Det var alldeles för stora och komplicerade för så lite labbtid som man fick. Jämför man med andra B-kurser som är datarelaterade så är dessa labbar 100 gånger svårare. Plus att labbar som ska vara inne under perioder som vi inte ens har planerat labbtid till att göra dom under. t.ex. Labb 4.
Labbar som har deadline tidigt i December och som inte ens är rättade nu en månad senare. Plus att vi använder äldre labbar för att göra det nyare labbarna, när inte ens första delen är rättad, väldigt svårt att veta ifall ens någon del av labbarna blir rätt då.

Detta är MYCKET DÅLIGT! Har läst kursen två gånger nu, men har fortfarande inte blivit någon ändring, var lika dåligt första gången. Tycker planering av labbar borde förbättras av läraren.

- The lectures were not good imo . Feels like most of what i've learnt during this course comes from self study and class mates. Many times i felt i did not have the previous knowledge to understand everything that teacher/you took for granted that i knew.

I also felt a bit overwhelmed by the very fast start and that some subjects are so big.

4 hr lecture from 8am is not working so good for me with this heavy learning curve.

- Not getting to know if lab 1 was OK before proceeding to lab 2-4.
If lab 1 was flawed, then the following labs would also be flawed as they build upon lab 1.
- Arbetsbelastningen. Laborationerna tog oftast så mycket tid att jag var tvungen att hoppa över föreläsningar. Detta gjorde även att tiden för att läsa in sig på det som gått igenom på föreläsningarna inte fanns. Dock så var labbarna mycket lärorika så jag vet inte hur båda dessa faktorer kan förbättras.

En annan dålig del är arbetsbelastningen som läggs på Donald, vilket vi studenter får lida av.

- föreläsningarna har alldeles för många sidospår. sidospåren brukar ibland handla om ämnen men inte alltid. samma sidospår tas upp väldigt många gånger.

vad som ska göras på labbarna är otydligt vet att Donald vill att vi ska fungera som konsulter då måste han ta sig tiden att svara på frågor.

Kursens laborations tillfällen är väldigt dåligt utsprida då laboration 3 och 4 inte hade något tillfälle alls.

- Extremt odetaljerade laborationer. Håll dig till ämnet på föreläsningar och gå inte in på hur mycket du har och göra i ditt arbete utanför kursen. Försök att berätta vad du ska gå igenom INNAN du börjar föreläsa om det. Lägg upp ett schema om vad varje föreläsning kommer att handla om, så man kan förbereda sig innan föreläsningen.

5. Open question

Comments

- Bra som vanligt, Donald Ross! :)
- Skulle vara acceptabelt för en C kurs, men tyvärr är detta en B kurs
- As seen above.

I wouldn't recommend this course for future students.

For me this course has unfortunately been a waste of time, sorry.

If I could I would give some kind of tips to the next course, but I feel that it won't make any difference. As a wise person once said:

"You cannot teach a grown-up dog to sit".

You may refer to this evaluation during our last lecture if you want a personal meeting afterward.

- Överlag kändes kursen tafflig och oseriös, man kände inte igen sig från tidigare kurser. Vilket är synd då den handlar om ett så roligt och viktigt ämne.
- Det är en bra kurs, men labbarna behöver tänkas över, speciellt planeringen.
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- Tack för en i övrigt mycket väl genomförd kurs.
- Hoppas den bristande kvalitet på kursen beror på att Donald har haft mycket att göra och detta rättas till.
- Överlag tycker jag att kursen var bra. Innehållet var mycket bra. MEN, detta är ingen 7.5p kurs med tanke på laborationerna, absolut inte.

Hoppas alla mina klagomål är bearbetade innan kursen programspråk drar igång:)

Den kursansvarige lärarens egna synpunkter och kommentarer på kursvärderingen:

(1) Comments on the Course Evaluation (10 students):

- Reactions to the course seem to be rather broad 40% (4 students) saying very low (2)/low quality (2) and 60% (6 students) saying acceptable (3) / high quality (3). The sample itself is about a sixth of the number of registered students which raises the question of how indicative this is.
- Certain reactions appear to be very strong – this may be due to differences in expectations with regard to the course – this is especially true of the labs this year. See also the comments on the labs below.
- Attendance at both the lectures and labs has been around 50% (at best) since the beginning of the course. The C workshop had attendance levels between 33% and 50%. This is the first time that this has happened in my 20 years of teaching at Karlstad University! One can only speculate as to the reasons why. Whether this has contributed to the final result is an open question.
- Feedback from the students has been almost non-existent. One comment was made about lab 1 a week or so before the deadline to the effect that very few students would complete the lab in time. When the deadline arrived only 5 groups had handed in the lab. With reference to one comment above, it is difficult to correct labs if they have not been handed in!

(2) Comments on the exam results (and comparisons with earlier exams):

Genomströmning och betygsutfall (ange antalet tentatillfällen)

45 studenter examinerades på ordinarie tentatillfället

Betyg 5 (0 studenter (0%)) betyg 4 (5 studenter 11%) betyg 3 (10 studenter (22%))

Betyg U (30 studenter (66%))

33% godkända 66% underkända

This may be compared with previous results for the exam

Pass rates: 2010: 33%, 2011: 51%, 2012: 41%, 2013: 33%

Similar questions have been asked in the exams during this period.

The marks for 2 earlier courses in programming (DVGA02 and DVGA03) were compared over the last 4 years (see below)

Kursanalyserna för DVGA02 och DVGA03 åren 2010-2013 har kollats och sammanställt genomströmningen i tabellen nedan. Med genomströmning menar jag antalet som klarat hela kursen / antalet registrerade på kursen.

År	DVGA02 (dai)		DVGA03 (dai + pvd)	
	reg.	genomstr.	Reg.	genomstr.
2010	30	47 %	29	17 %
2011	18	61 %	28	61 %
2012	29	45 %	41	51 %
2013	41	44 %	38	26 %

A similar trend may be observed, with a high point in 2011.

The result was also compared with the result for the Mathematics course which ran in parallel with this course. 25% of the students passed the Mathematics course.

The distribution of the exam marks for 2013 was

Points	0-4.5 (U)	5-9.5 (U)	10-14,5 (U)	15-19.5 (3)	20-24.5 (4)	25-30 (5)
# students	3	10	17	10	5	0
percentage	7%	22%	38%	22%	11%	0%

Compared with 2012

Points	0-4.5 (U)	5-9.5 (U)	10-14,5 (U)	15-19.5 (3)	20-24.5 (4)	25-30 (5)
# students	2	8	12	7	5	3
percentage	5%	22%	32%	19%	14%	8%

Compared with 2011

Points	0-4.5 (U)	5-9.5 (U)	10-14,5 (U)	15-19.5 (3)	20-24.5 (4)	25-30 (5)
# students	2	3	8	10	2	2
percentage	7%	11%	30%	37%	7%	7%

Compared with 2010

Points	0-4.5 (U)	5-9.5 (U)	10-14,5 (U)	15-19.5 (3)	20-24.5 (4)	25-30 (5)
# students	3	5	5	7	3	0
percentage	13%	22%	22%	30%	13%	0%

Comments (these comments apply in general over the period 2010-2013)

1. Some students seem unable to read the exam questions carefully before starting their answer. In many cases this costs marks and in several cases was the deciding factor between pass and fail.
2. When required to reply "in detail" the students ignored this instruction and wrote between half a page and a full page. This was despite having been given a presentation on exam technique during the course where it was specifically pointed out what would be required in the exam.
3. Students have been given "model answers" in Facits to previous exams and on the revision web pages for the course. Despite this many seem unable to structure their answers to exam questions.

ACTION Students need to improve on their exam technique. They also need to improve their ability to articulate solutions to problems in the exams.

(3) Comments on the lab results:

- By the end of the course (January 2014) the labs have not been graded. Only 5 groups met the deadline for lab 1 and the general deadline for the labs was extended to 140228 to give the students a chance to complete the labs.
- The labs seemed to be one of the major difficulties with the course this year. These labs were revised for HT2012 where 79% (26 students) had passed the labs by the end of the course. The difference compared with the previous year came as rather an unexpected surprise.
- The main problems seem to be (i) programming difficulties with C and (ii) problem solving and abstraction difficulties.
- During the lab sessions with 2 lab supervisors, the supervisors were not overwhelmed with requests for help.
- The labs were graded by 140401 (the time of writing this analysis) and the results are presented below
- 58 students were registered on the course of which 8 were reregistered. 48 students handed in lab 1 which has been taken to represent the number of active students in the course. In total 26 students passed the labs (54%) and 22 students did not pass the labs (46%). The grade distribution was

Grade	3	4	5	Total Pass	U - Fail
# students	7	11	8	26	22
Percentage	15%	23%	17%	54%	46%

Using 48 (active) students as a baseline the lab hand-ins may be further analysed

Lab	Lab 1	Lab 2	Lab 3	Lab 4
# students	48	38	37	25
Percentage	100%	79%	77%	52%

If the students had sufficient points to pass the labs (minimum 15p of 30p) they were given the choice of reporting 3 labs out of 4 and dropping one lab.

Most students in this position took advantage of this offer.

A lab by lab analysis of the grades obtained gave

Lab 1 Grade	3	4	5	Total Pass	U - Fail
# students	6	19	13	38	10
Percentage	40%	13%	27%	79%	21%

Lab 2 Grade	3	4	5	Total Pass	U - Fail
# students	7	4	16	27	5
Percentage	22%	13%	50%	84%	16%

Lab 3 Grade	3	4	5	Total Pass	U - Fail
# students	7	5	10	22	15
Percentage	19%	14%	27%	59%	41%

Lab 4 Grade	3	4	5	Total Pass	U - Fail
# students	2	2	14	18	7
Percentage	8%	8%	56%	72%	28%

Giving pass rates of between 59% and 84% for the labs which were handed in. For labs 2 and 4 50% or more received a grade 5 – for labs 1 and 3 this was 27%. For all labs 40% or more of the students received a grade 4 or 5. This is a marked contrast to the exam performance.

Comments on the general performance in the exam and labs

- The lab results indicated much better performance than the exam results
- In the exam, 17 of 45 students (38%) were in the range 10-14.5 points. I.e. just under a pass result. Had this group performed better, then up to 71% would have passed the exam.
- Taken together, the results suggest that for this group, the bigger problem was the exam and with better exam technique (or more care), more students would have passed the course.

A general comment on this group after several investigations (see below) is that it was a very mixed group ability-wise. 30 students of 58 (52%) (again see below) have not passed **4 or more** previous exams (out of 12) and seem content(?) to continue with their studies regardless. The DSA course is considered one of the more difficult courses in the programme and the effect on this group has been noticeably harder.

The final result was that **26 of 48 students passed the labs, 15 of 45 students passed the exam and 12 students passed the course.** Not all students took the exam nor handed in the labs. An estimated maximum of 48 students of 58 were “active” participants in the course. Attendance at lectures and labs was around 30 students.

(4) Comments on previous changes to the course:**Changes made for the previous course HT2012:**

At the beginning of the second year, a Workshop in C (1 week) was held since the C language would be used in several courses during the second year including Data Structures and Algorithms (DSA).

Comment for HT2013: The C workshop was held in the first 2 weeks of the Operating Systems course (DVGB01). **56 students were registered on the course and most attended the introductory lecture for the C workshop but then between a third and a half actually attended the workshop.** This was unfortunate since (i) the students did not have the possibility to practise C programming and (ii) some of the exercises were directly relevant to the Data Structures and Algorithms (DSA) course (DVGB03)

The course book has been reclassified as reference literature and the course lecture notes and web pages used instead as course material.

The lab exercises have been automated and the students given more material in the form of pre-prepared code and data before they start each exercise.

Literature: Instead of a course book, a compendium together with web references to Wikipedia sources was provided. The reasons for this being (i) fewer and fewer students were actually buying the course book and (ii) the course book became more expensive and less relevant to the goals of the course.

Course Web Pages: See <http://www.cs.kau.se/cs/education/courses/dvgb03/>

(5) General Comments on the outcome of the course:

- Low attendance both at the C workshop in August/September and at the DSA lectures and labs may be a contributory factor to the negative outcome.
- Lack of communication and student feedback has also contributed to the course outcome
- The course has students from 7 different programmes which makes it more difficult to know what the students' programming and computer science knowledge and abilities actually is.

Förslag till förändringar inför nästa kurstillfälle och förväntad effekt

There has been a general discussion in the department about what happened with this course but it is too early (March 2014) to state here what the possible outcomes will be. As mentioned above, a quick check was made on 2 previous courses (DVG A02 and DVG A03 which both have programming aspects).

The students' first language was Java and this may be changed to C to give students a longer period programming in the one language. This is also under discussion in the department since this will affect several courses.

Another possibility is to reduce the number of lab exercises. Again this will be examined. However, reducing the number of lab exercises will also reduce the number of points for the lab component of the course and possibly moving from a 30p/30p lab/exam division to a 20p/40p lab/exam division.

At the time of writing (140401) the following actions have been taken

- The results of the courses taken prior to the DSA course were examined and the following points noted (i) attendance at lectures and lab session was already a problem and was not particular to DSA (see for example the course analyses for DVGA02 and DVGA03) (ii) results for these courses was similar to DSA – around a 25% throughput
- The transcript (from Ladok) for each of the 58 students was examined to see if there were any discernible trends in performance. The period examined was terms 1-3 of each 3 year program i.e. the first 50% of the program where the students have taken 12 courses (including DSA).
 - 30 students of 58 (52%) of the students have not passed **4 or more courses** (out of 12)
 - Details: number of courses not passed (number of students) – 4 (8), 5 (8), 6 (5), 7 (2), 8 (3), 9 (3), 10 (0), 11 (0), 12 (1)
 - Only 8 students of 58 (14%) have passed 10 or more courses (out of 12)
- The student advisor has been informed and the students have been called to a meeting and in some cases given individual study plans
- Earlier follow-up of student performance should be introduced to avoid a repeat of what happened in DSA. (proposal)
- The prerequisite requirements for each course should be revised and students made more aware of these requirements. (proposal)

Changes made for the next instance of the course (Autumn 2014)

- The course has been extensively revised and rewritten.
- The number of lectures has been reduced from 20 to 16 (20% reduction) in line with the department's guidelines for courses (16 lectures). As a result, several topics have been removed from the course.
- The number of labs has been reduced from 4 to 3: (i) performance analysis (reduced) (ii) AVL tree implementation (iii) graph algorithm implementation (reduced). As a result the lab component of the course is now worth 20p of 60p for the course (a reduction from 30p to 20p).
- As a result of the reduction in lab points, the exam is now worth 40p of 60p (previously 30p).
- Lab 1 of the 2013 course will now be used as a teaching example of the effects of abstraction on programming and the students will receive the full code for this example which in turn may be used as a basis for the new AVL-tree and graph labs.
- Stricter control of progress with the labs to be introduced during the lab sessions.
- New and stricter lab submission rules to be drawn up.

Intygar att student har beretts möjlighet att delta / har deltagit	Namnförtydligande
Kursansvarig lärare, underskrift	Namnförtydligande Donald F. Ross
Examinator har deltagit/taget del av, underskrift	Namnförtydligande Donald F. Ross