

Course analysis SK1118, HT20

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Date: 2021-01-24

Course information

Course code: SK1118

Course name (English): Electromagnetism and waves

Course name (Swedish): Elektromagnetism och vågrörelselära

Points: 7.5

Programme: CINTE (Swedish), TCOMK (English), (and students from previous IF1613)

Period: 2

Responsible: Max Yan

Examiner: Urban Westergren

Teacher of lectures: Max Yan

Teacher of exercises: Richard Schatz

Teacher of Labs: Richard Schatz, Marinus Versteegh, Albert Peralta Amores, Marina Zelenina

Course design

Online lectures were given under COVID-19 pandemic. Since TCOMK contains international students, we had to make sure at least 50% of their lectures are held on campus (upon Migrationsverket's request). To be fair for all students, CINTE and TCOMK groups of students rotated their turns for attending the lectures/exercises. Lectures were all held in physical lecture rooms and were recorded (via ZOOM); recordings were placed in Canvas immediately after the lectures. Exercises were however not recorded; therefore, students in principle could attend only 50% of the exercises (some attended 100% since not much were attending). As a compensation, Richard allowed them to ask questions from problems belonging to previous exercise sessions. One lab (interference and diffraction) was carried out physically with COVID-measures, and the other (optical fiber) was carried out digitally with video recorded before course started. Exams (pre and final) were held online via Canvas without ZOOM monitoring.

Other major changes of the course since its last instance: Course was moved to AlbaNova. An English compendium "Electromagnetism under 100 pages" were prepared before course start. It has a better coherence to the Swedish textbook. It therefore replaced the English textbook used in the previous years. The compendium was improved in various details during the course. The main lecture medium was powerpoint via ZOOM (mainly whiteboard was used in previous years). Modules were created in Canvas. One pre-exam (three hours) was implemented, instead of three (1 hour each).

Meeting with students during the course

No special meeting was arranged during the course. Constant feedbacks were obtained during the lectures or through Email. No special problems were raised, except one mentioned that she had final exams for two courses on the same morning.

Students' results

Registered for course: 71. Registered for exam: 62. Attended for exam: 44

Passed exam: 39 (89%)

Students' opinions

Questionnaire was electronically sent out to students after the course (Appendix). 20 submitted replies (Appendix). The questionnaire comprises of five sections: **General**, **Lectures**, **Exercises**, **Labs**, **Others**. Below are summaries of the student's opinions on the sections.

- **General:** Most students were very clear about the goal of the course in the beginning, satisfied with the course description, well informed during the course, and found the course material easily. Unlike last year, most students (17 out of 20) used the English compendium; among them, 8 think it is "very good". In comparison, opinions about the Swedish textbook were mixed with neutral average (8 replies in totals), which were similar to opinions in the last year. Students agreed that "having a pre-exam" is a MUST. Majority of students also think we have done enough measures to adapt this course to the COVID situation (one said we have not done enough at all, which might be related to the decision of not recording the exercise sessions, mentioned below).
- **Lectures:** Out of 20 students, 40% (8) followed all lectures, including online. Others followed partially. One did not follow at all. Almost half students feel the difficult level is just OK; the other half think it is a bit difficult or very difficult. Tempo of the lectures is OK, a bit towards fast side. Online as compared to physical lectures have in general acceptable quality according to majority of the students.
- **Exercise:** 7 out 20 did not attend the exercise sessions at all, whereas 6 attended 100%. Difficulty level is OK but some thought they are too difficult. Tempo were just right, as was found last year. 14 out 20 want recorded exercises; 2 said they don't need recording.
- **Labs:** Lab instructions, difficulty levels, and tempo are all very good. The online lab worked less satisfactorily than a physical lab, but in general it fulfills the basic purpose.
- **Others:** Most who replied think their previous studies prepared well and even very well for this course. This is in contrast to last year's opinions to this question (in general poorly prepared). Almost all of them think mathematics in this course is manageable. Also in contrast to last year, the course does not combine that well with other course(s) in P2. Workload per credit is found to be OK. Time spent on the course per week is quite diverse for different students. The pre-exam was said to be neutral in difficulty; the final exam in general is slightly more difficult than the pre-exam (which was what the course responsible had planned).

Analysis and comments

Issues identified:

- Students in general want to attend the exercises sessions. However, this year under COVID pandemic we restricted attendance to exercises. We also required the students to have facemasks during exercise sessions. Facemasks were also required for lectures if the number of students was more than 25 (initially) and later on (15). Those policies discouraged many from attending especially the exercises. Solution: Record exercises if COVID persists (hopefully not).
- Students wanted more examples during lectures and also in the English compendium.

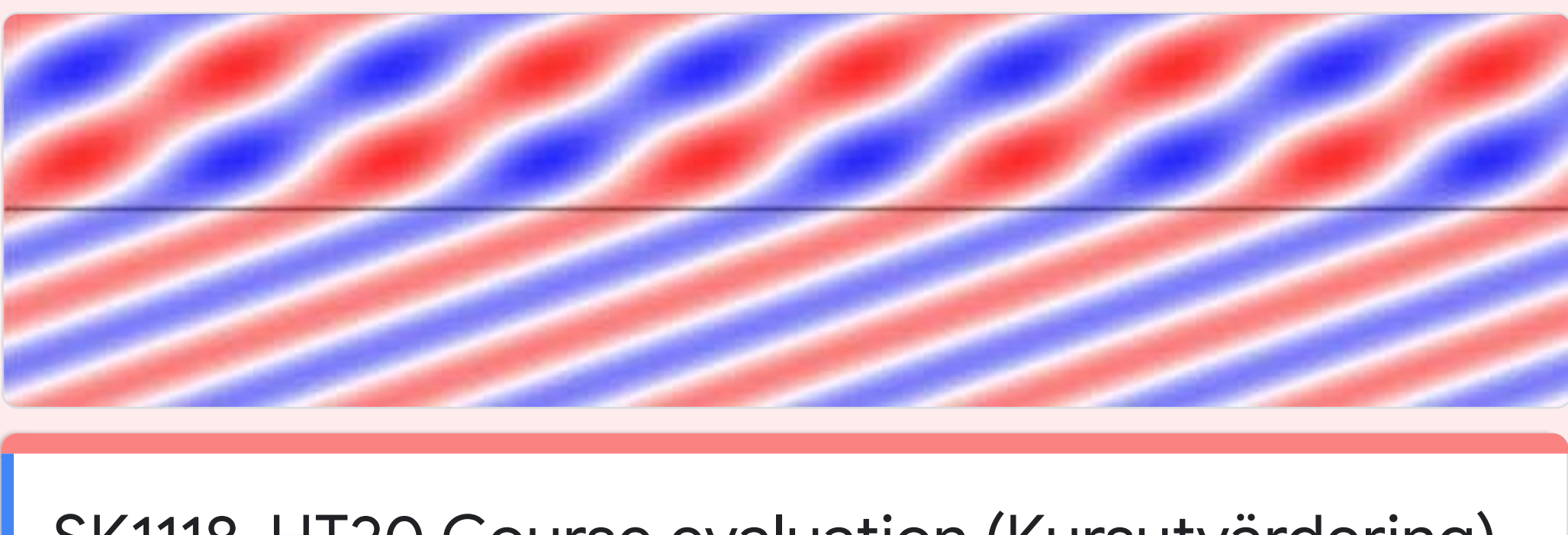
- “Everything that had to do with electromagnetic waves up to waveguides was especially hard to understand.” Maybe an extra lecture is needed for electromagnetic waves?
- One remarked that the course SF1686 Multi-variable Analysis shall be a prerequisite.
- “Change the lab instructions so they are more relevant to the actual lab work”
- “Suggested solutions” do not contain figures.

Positive observations:

- Most students think the English compendium is very good.
- Pre-exam was found to be a MUST for students. Those students who prepared themselves well for the pre-exam were even better prepared for the final exam.
- “This was the most well-organised and prepared course I've taken in a while, especially given the circumstances.”
- “Overall it was a very well structured and good course. Having a pre exam was amazing because I felt so ready before the exam since I had already studied for pre exam.”
- “Overall, I think it was a great course, well prepared, and I enjoyed it a lot!”

Planned course development

- Course description will be improved.
- Further improvement of English compendium. More examples will be added (especially for EM waves).
- Lecture content: De-emphasize formula derivations even further, and add more calculation examples and applications.
- Maybe an extra lecture is needed for electromagnetic waves?
- Exercises: English exercise PDFs contain Swedish wordings. These shall be corrected.
- More figures with clear annotations in suggested solutions.



SK1118-HT20 Course evaluation (Kursutvärdering)

Answer by Friday 2021-01-22 (Svara senast fredag 2021-01-22)

GENERAL (ÖVERGRIPANDE FRÅGOR)

Description (optional)

How clear were the goals of the course when it started? (Hur bra framgick kursens mål vid kursstart?) *

1 2 3 4 5

Not clear at all Very clear

How was the information in the course description? (Hur var information i kursbeskrivningen?) *

1 2 3 4 5

Not clear at all Very clear

How was the information during the course? (Hur har informationen varit under kursens gång?) *

1 2 3 4 5

Not clear at all Very clear

How was the access to the course material? (Hur var tillgången på kursmaterial?) *

1 2 3 4 5

Very difficult to locate (couldn't find) Very easy

Which textbook you have used mostly? (Vilken lärobok har du mest använt?) *

English compendium/textbook

Svenska lärobok

What do you think about the English compendium?

1 2 3 4 5

Not good at all Very good

Vad tycker du om den svenska läroboken?

1 2 3 4 5

Mycket dåligt Mycket bra

What do you think about having a pre-exam? (Vad tycker du om att det finns en kontrollskrivning?) *

1 2 3 4 5

Not helpful for me Very helpful for me

Have enough measures been made to adapt to the COVID-19 pandemic? (Har tillräckliga åtgärder gjorts för att anpassa till COVID-19 situationen?) *

1 2 3 4 5

Not enough at all Absolutely yes

LECTURES (FÖRELÄSNINGARNA)

Description (optional)

How many per cent of the lectures did you participate in, including online? (Hur stor procentdel av föreläsningarna deltog du i, inclusive online?) *

0%

25%

50%

75%

100%

How was the difficulty level of the lectures? (Hur var svårighetsnivån på föreläsningarna?)

1 2 3 4 5

Too easy Too difficult

How was the tempo of the lectures? (Hur var takten på föreläsningarna?)

1 2 3 4 5

Too slow Too fast

What do you think about the online lectures as compared to physical lectures? (Vad tycker du om onlineföreläsningarna jämfört med fysiska föreläsningar?)

1 2 3 4 5

Much worse than physical ones Much better than physical ones

EXERCISES (ÖVNINGARNA)

Description (optional)

How many per cent of the exercises did you participate in? (Hur stor procentdel av övningarna deltog du i?) *

0%

25%

50%

75%

100%

How was difficulty level of the exercises? (Hur var svårighetsnivån på övningarna?)

1 2 3 4 5

Too easy Too difficult

How was the tempo of the exercises? (Hur var takten på övningarna?)

1 2 3 4 5

Too slow Too fast

How much do you want recorded exercises? (hur mycket önskar du inspelade övningar?)

1 2 3 4 5

Very little Very much

LABS (LABORATIONERNA)

Description (optional)

What do you think about the laboratory instructions? (Vad tycker du om laborationsanvisningarna?) *

1 2 3 4 5

Very good Very poor

How was the difficulty level of the labs? (Hur var svårighetsnivån på labbarna?) *

1 2 3 4 5

Too easy Too difficult

How was the time for the labs? (Hur var tiden på labbarna?) *

1 2 3 4 5

Too long Too short

Did the online lab work out OK for you as compared to a physical one? (Funkade den online laborationen för dig, jämfört med ett fysiskt labb?) *

1 2 3 4 5

Much worse than a physical lab Much better than a physical lab

OTHER QUESTIONS (ÖVRIGA FRÅGOR)

Description (optional)

How well have your previous studies prepared for this course? (Hur bra var dina förkunskaper?) *

1 2 3 4 5

Very poorly Very well

How was the level of mathematics in the course? (Hur var den matematiska nivån i kursen?) *

1 2 3 4 5

Too easy Too difficult

How was the combination with other parallel course(s) in period 2? (Hur gick studierna att kombinera med den parallella kursen i period 2?) *

1 2 3 4 5

Difficult to combine Easy to combine

How was the workload in comparison to the number of credits? (Hur var arbetsbördan i förhållande till kurspoängen?) *

1 2 3 4 5

Too little work Too much work

How many hours per week did you study during the course? Include lectures etc. (Hur många timmar per vecka studerade du under kursen? Inkludera föreläsningar etc.) *

0-5 hours

5-10 hours

10-15 hours

15-20 hours

> 20 hours

What do you think about difficulty of the pre-exam? (Vad tyckte du om svårighet av kontrollskrivningen?) *

1 2 3 4 5

Too easy Too difficult

What do you think about difficulty of the final exam? (Vad tyckte du om svårighet av tentan?) *

1 2 3 4 5

Too easy Too difficult

In what way would you like to improve the course? (På vilket sätt skulle du vilja förändra kursen till det bättre?)

Long answer text

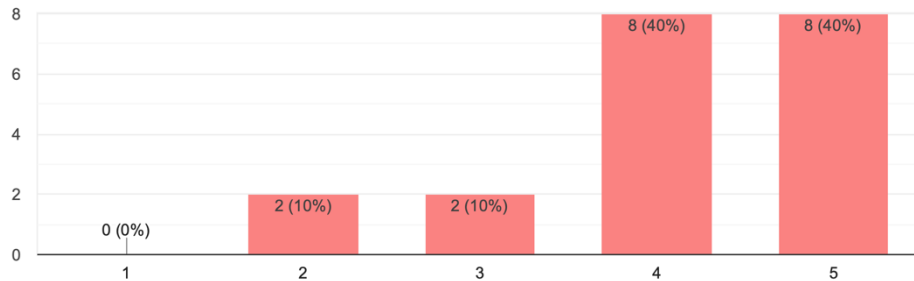
SK1118 HT2020 Course survey results

Sent: 2021-01-14; closed: 2021-01-22

GENERAL (ÖVERGRIPANDE FRÅGOR)

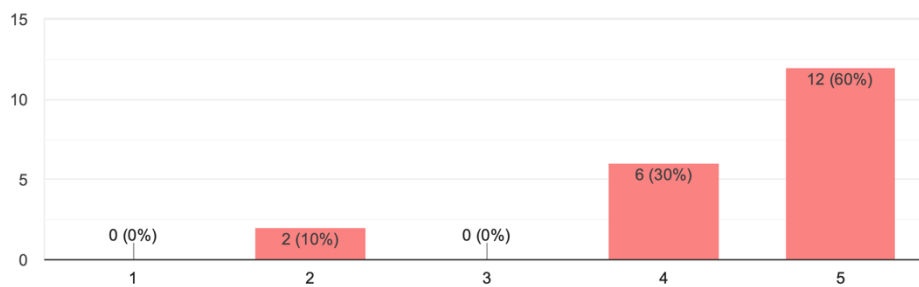
How clear were the goals of the course when it started? (Hur bra framgick kursens mål vid kursstart?)

20 responses



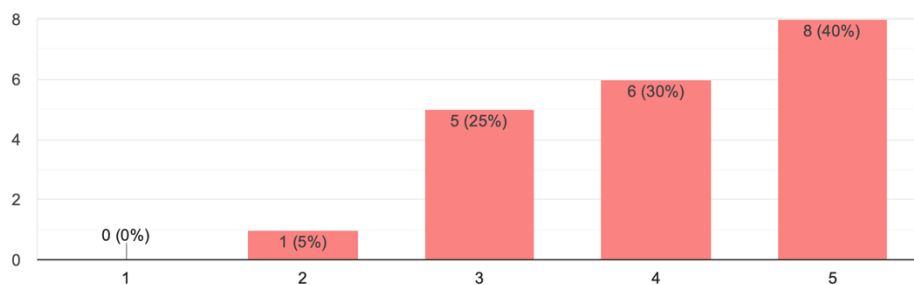
How was the information in the course description? (Hur var information i kursbeskrivningen?)

20 responses



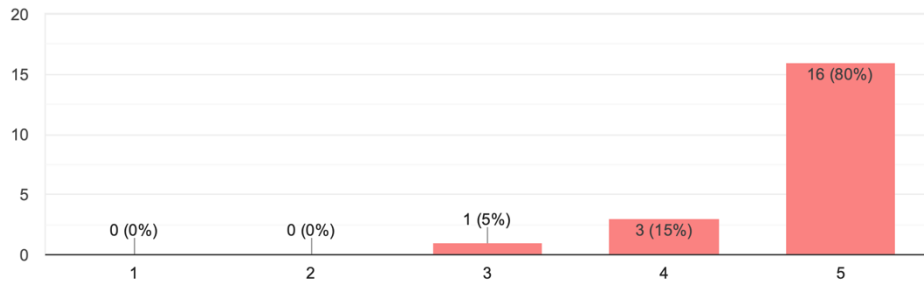
How was the information during the course? (Hur har informationen varit under kursens gång?)

20 responses



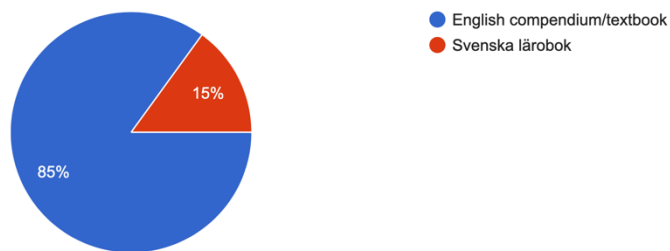
How was the access to the course material? (Hur var tillgången på kursmaterial?)

20 responses



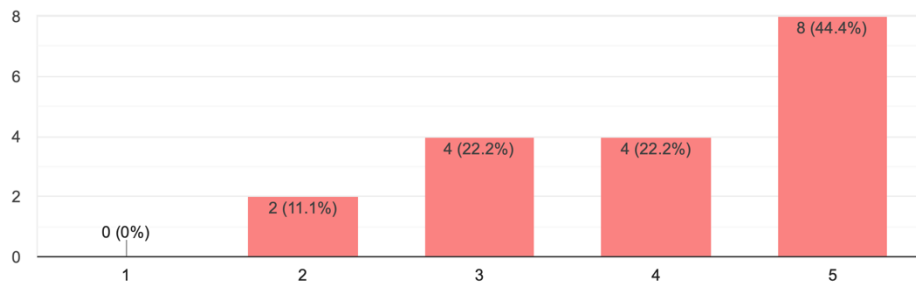
Which textbook you have used mostly? (Vilken lärobok har du mest använt?)

20 responses



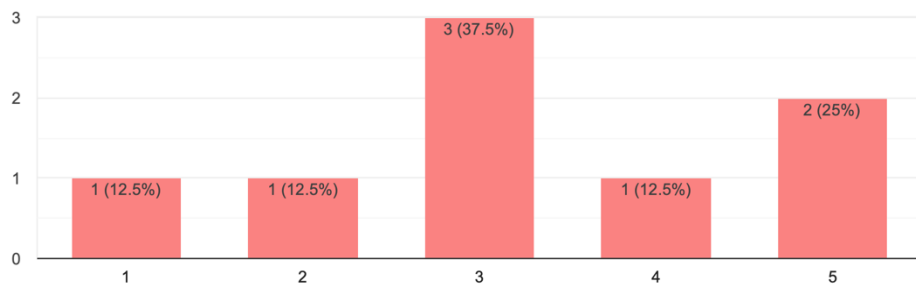
What do you think about the English compendium?

18 responses



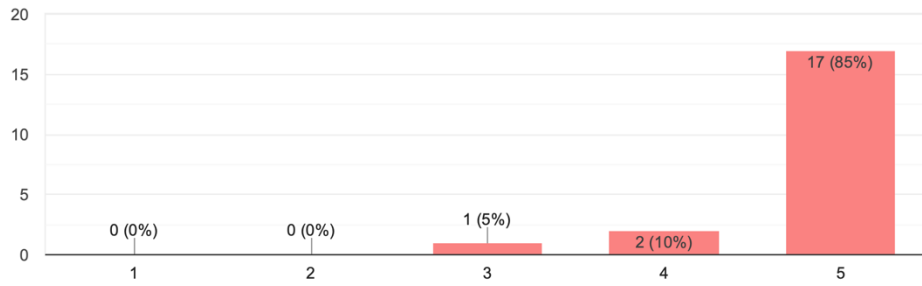
Vad tycker du om den svenska läroboken?

8 responses



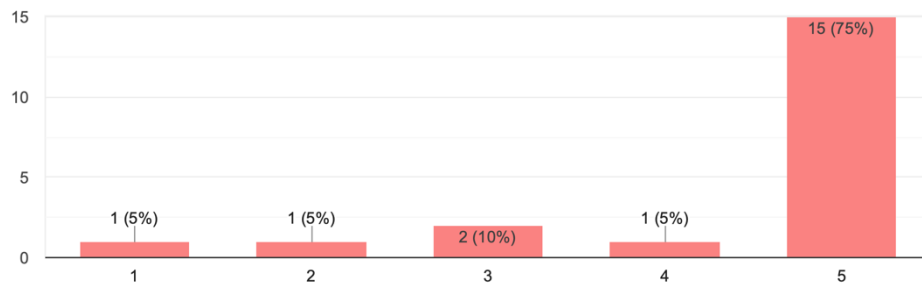
What do you think about having a pre-exam? (Vad tycker du om att det finns en kontrollskrivning?)

20 responses



Have enough measures been made to adapt to the COVID-19 pandemic? (Har tillräckliga åtgärder gjorts för att anpassa till COVID-19 situationen?)

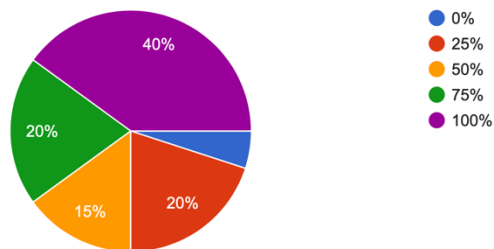
20 responses



LECTURES (FÖRELÄSNINGARNA)

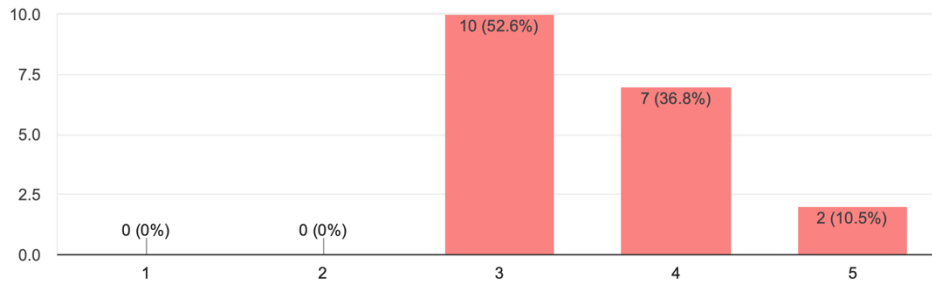
How many per cent of the lectures did you participate in, including online? (Hur stor procentdel av föreläsningarna deltog du i, inclusive online?)

20 responses



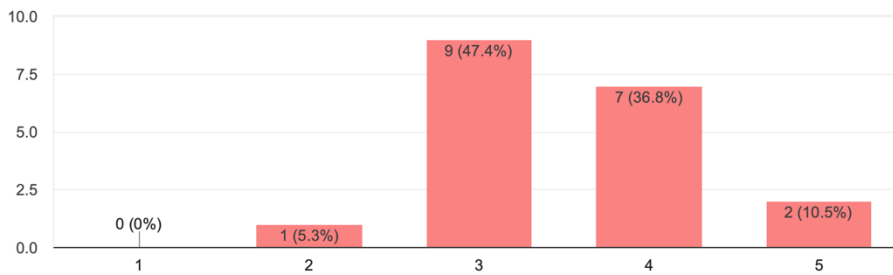
How was the difficulty level of the lectures? (Hur var svårighetsnivån på föreläsningarna?)

19 responses



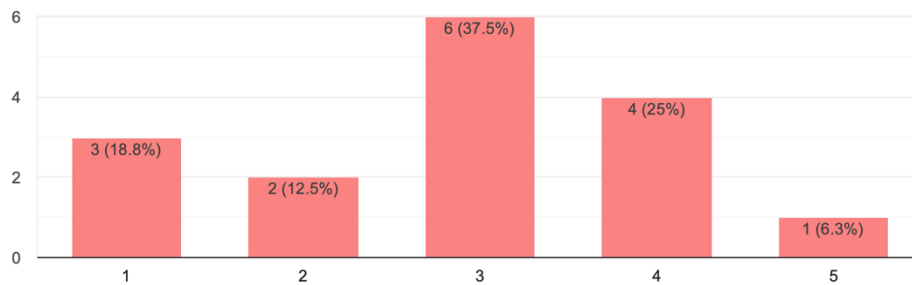
How was the tempo of the lectures? (Hur var takten på föreläsningarna?)

19 responses



What do you think about the online lectures as compared to physical lectures? (Vad tycker du om onlineföreläsningarna jämfört med fysiska föreläsningar?)

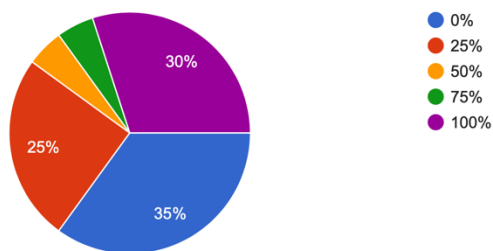
16 responses



EXERCISES (ÖVNINGARNA)

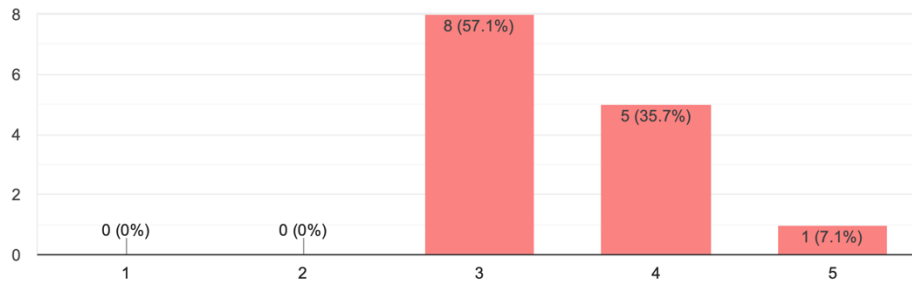
How many per cent of the exercises did you participate in? (Hur stor procentdel av övningarna deltog du i?)

20 responses



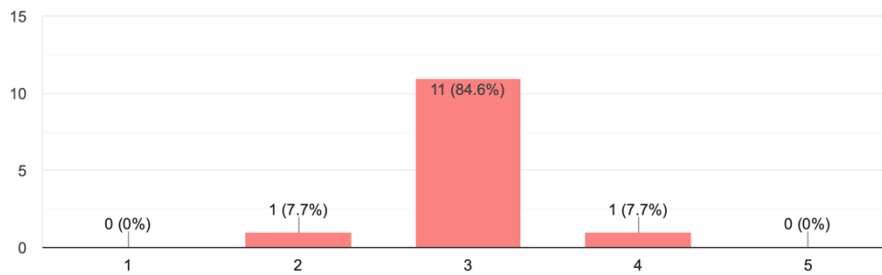
How was difficulty level of the exercises? (Hur var svårighetsnivån på övningarna?)

14 responses



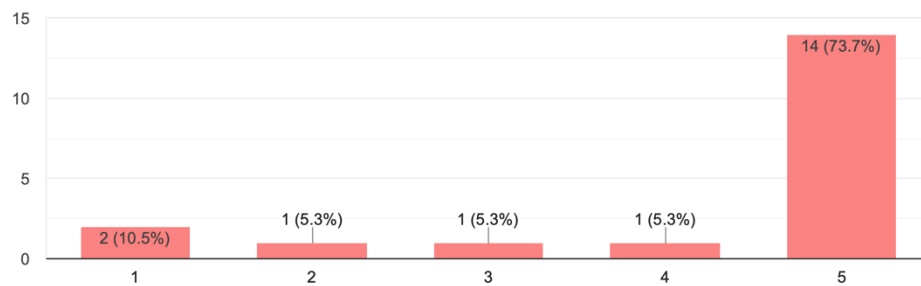
How was the tempo of the exercises? (Hur var takten på övningarna?)

13 responses



How much do you want recorded exercises? (hur mycket önskar du inspelade övningar?)

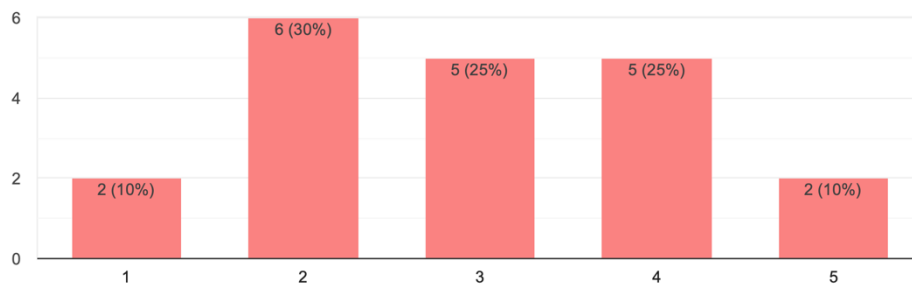
19 responses



LABS (LABORATIONERNA)

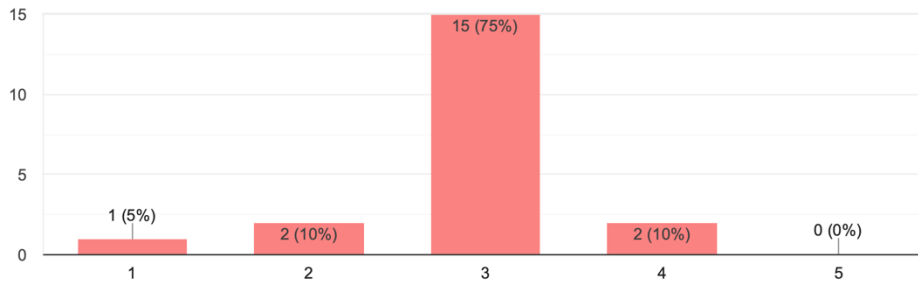
What do you think about the laboratory instructions? (Vad tycker du om laborationsanvisningarna?)

20 responses



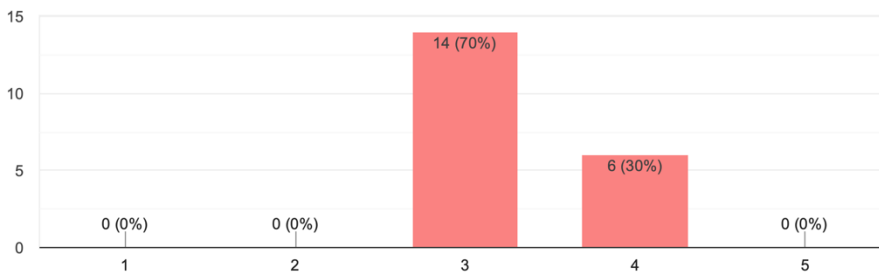
How was the difficulty level of the labs? (Hur var svårighetsnivån på labbarna?)

20 responses



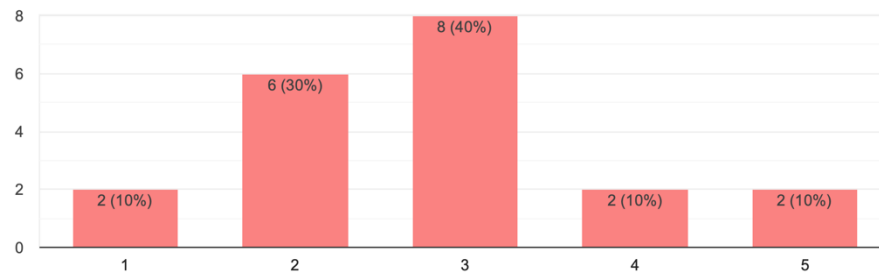
How was the time for the labs? (Hur var tiden på labbarna?)

20 responses



Did the online lab work out OK for you as compared to a physical one? (Funkade den online laborationen för dig, jämfört med ett fysiskt labb?)

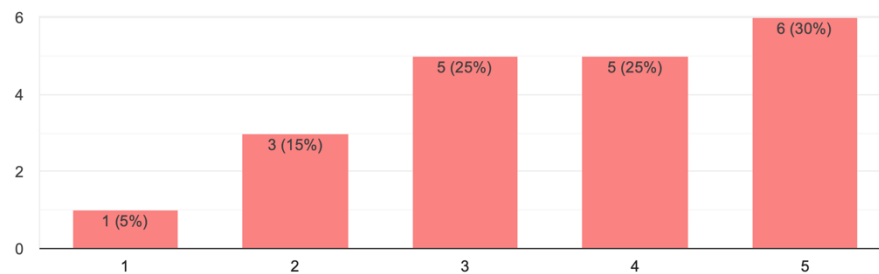
20 responses



OTHER QUESTIONS (ÖVRIGA FRÅGOR)

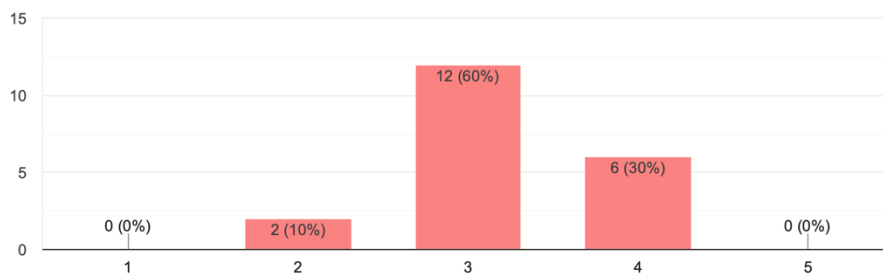
How well have your previous studies prepared for this course? (Hur bra var dina förkunskaper?)

20 responses



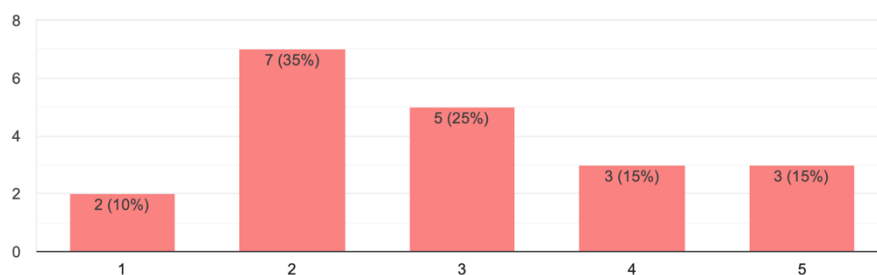
How was the level of mathematics in the course? (Hur var den matematiska nivån i kursen?)

20 responses



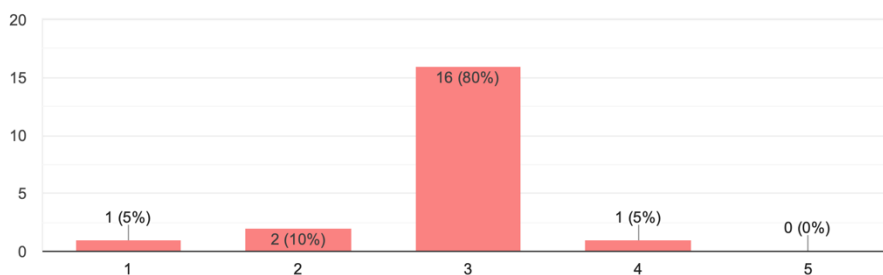
How was the combination with other parallel course(s) in period 2? (Hur gick studierna att kombinera med den parallella kursen i period 2?)

20 responses



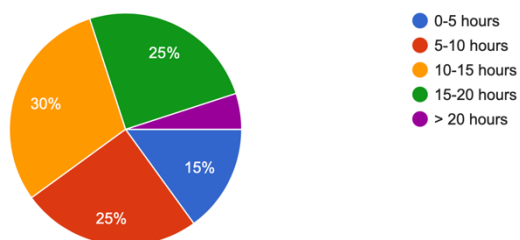
How was the workload in comparison to the number of credits? (Hur var arbetsbördan i förhållande till kurspoängen?)

20 responses



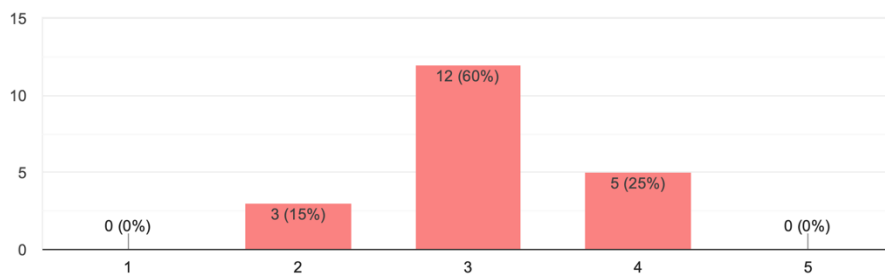
How many hours per week did you study during the course? Include lectures etc. (Hur många timmar per vecka studerade du under kursen? Inkludera föreläsningar etc.)

20 responses



What do you think about difficulty of the pre-exam? (Vad tyckte du om svårighet av kontrollskrivningen?)

20 responses



What do you think about difficulty of the final exam? (Vad tyckte du om svårighet av tentan?)

20 responses

