Kurssammanställning FYSC11, Atom- och molekylfysik FYSC11, HT 2020

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In total the course had 17 physics students and 10 teacher students (numbers taken from ladok).

Betyg:
Physics students:
5 VG, 5 G, 1 U (the rest did not attend the exam)

Teacher students: 3 VG, 5G, 1 U

Utvärdering

I. Sammanfattning av kursvärderingen

Total answers: 11 physics students, 3 teacher students

Kort sammanfattning av resultatet (Physics students):
All lectures and labs for this version of the course was conducted at on campus teaching.

As students before often found that this course demanding the survey conducted by survey & reports this year included questions about the workload. In summary the average students used:

- 37.8 hours (physics) and 6.7 hours (teacher) on textbook reading
- 28.9 hours (physics) and 22.5 hours (teacher) on solving rehearsal problems
- 57.2 hours (physics) and 23.3 hours (teacher)on solving hand-in problems
- 20.9 hours (physics) and - hours (teacher) on the computer project
- 21.4 hours (physics) and 38.3 hours (teacher) to train for exam

166 hours (physics) and 90.8 (teacher)

Equal to a little more than 4 weeks of full time studies excluding the 2 labs (one with report and one without) and the lectures fitting relatively well with 7.5 hp equal to 5 week of full time study. A closer inspection of the numbers reveals, however, that some students use much more.

The average physic/teacher student attended 84%/87% of the lectures, but only 35%/100% of the problem-solving exercises. The rehearsal problem session placed in direct connection to lectures was attended by 55%/60% of the students.

There is consensus among the students that the course is important (one teacher student disagree), but that the workload at the same time is high or too much. Also there is consensus that hand-in problem contributed greatly to the understanding.

The evaluation of the teacher is, however, more mixed. Most students find that the teachers have been good at explaining things, but we also note that 5 out of 13 disagree about this statement. The experimental and computer lab were not well received. Most students found the written exam very difficult.

The most clear trend in the written feedback is that some students like the course, while others do not like it at all. Feedback ranges from: "*The professors were great and overall the best courses I have taken so far*" to "*Also, Jan said that the intentions for this course was to set up the difficulty, which is admirable, but rather than doing that, focus on the parts in the course and try to perfect them since the course is far from perfect.*"

Anyway, trying to find trends in the written feedback, we identify the following:

Positive:

- Hand-in problems and exercise sheet are found very useful by many students.
- Students like that we posted lecture notes online together with slides and appreciate when we use time to discuss exercises during the lectures to make sure that the students understand it.

Negative:

- Some students find that the course should come after FYSN17, which is difficult to change, as FYSN17 is an advanced course.
- In general, the part of molecules was found to be confusing and more time should be spend on this.
- Some students complain about unclear communication and exams that was corrected too late.
- Some students want better mathematical explanations or proofs.
- Overlapping deadlines with the FYSC12 course which is far from ideal.
- Too much time is used on the hydrogen atom and too little time on many electron atoms and molecules.

II. Lärarlagets kommentarer

Based on the student evaluation shown above and the teachers own self-reflection on the course, we conclude the following:

- Even though we tried to be transparent when communicating how grading is done students still find this confusing. We should once again do an extra effort here.
- Some students want everything explained in great detail and fully mathematical correct, while others already find that we cover too much material. This is very difficult to solve. For next version of the course we will try to emphasize that it is good to see the same concept explained more than once and maybe not in full detail the first time. A solution can also be to record videos with mathematical

derivation, and keep the most important ones for the lectures. Hence ambitious students can develop their understanding of quantum mechanics.

- More time should be reserved for the parts about molecules, while the part about the hydrogen atom can be covered quicker. The full derivation of the hydrogen atom will, however, remain as FYSB22 does not cover this.

- More focus should be given on the labs and computer project.

III. Utvärdering av förändringar sedan förra kursen

Last year's suggestion in *italic*

- We will use S&R for course evaluations next year.
>>> This worked better, but it is still disappointing that we do not get more feedback. Ideas for improving this is found below.

>>> The computer project was new this year. Overall, we would like to keep it, further improve it, and reduce its scope.

IV. Förslag till förändringar till nästa kurs

- Next year the course will run parallel with FYSC22. We should try to schedule the labs and handin in the best way to avoid that it becomes too stressful.

- The scope of the computer project should be reduced.

- A little more time could preferably be spent on molecules.

2019-05-04, sammanställt av Jan Knudsen och Mathieu Gisselbrecht.

Sammanställningen skickas till Johan Rathsman