

## **Preliminär Kurssammanställning FYSC11, Atom- och molekylfysik FYSC11, HT 2019**

**Kursansvarig:** Mathieu Gisselbrecht and Jan Knudsen

**Övriga lärare:** Foqia Rehman, Giulio D'Acunto, Hampus Nilsson (labs), and Lukas Wittenbecher (Hand-in & exercise problem sessions)

In total the course had 44 students registered in Canvas.

27 physics students participated in the written exam.

6 teacher students participated in the oral exam

On average 25-30 students attended each lecture

### **Betyg:**

Physics students:

3 VG, 13 G, 6 U for the rest labs were missing

Teacher students:

2 VG and 4 G

### **Utvärdering**

#### **I. Sammanfattning av kursvärderingen**

Totalt antal svar: 4

*Kort sammanfattning av resultatet:*

A questionnaire attached was filled out by the students and send by E-mail (anonymously) to PhD student (Virginia Boix). This information is attached to this course evaluation. Virginia removed all personal information and send one word file to the course responsible JK and MG. Only 4 Only 4 students replied.

We asked for a student representatives, but no students wanted to help with this. Some students complained later about the E-mail system for the course evaluation and next time the course is given we therefore plan to use Survey&Report.

In short the student feedback showed that the level of the course was appropriate (2) to a little too easy (2). All students felt that the lectures contributed to the understanding of material (3 top marks, and one above average). For the labs the evaluation more mixed, with 2 neutral students, one that felt the lab contributed greatly to the understanding of the material, and want that were slightly negative.

As the previous years the majority of the students would like that we follow a specific textbook.

In total we the course consisted of:

- 53 hours of lectures. Approximately, 75% of the time was here used on lecturing and 25% on working with rehearsal problems.

- 10 hours of exercise classes with lab instructor Lukas Wittenbecher. For the few of these exercise classes Jan Knudsen also helped (i.e. two teachers were present and this was needed).

- 3 Lab days for physics students and 2 lab days for teacher students + the time needed for writing the reports.

- In addition to this the 4 students used 7, 8, 10, 25 hours per week, respectively, on a mix of textbook reading and the solving exercises (specific numbers attached).

#### Student suggestions for improvements:

- No lectures before 9.15.
- Course evaluation by google forms or similar
- Complicated bonus-point system
- Short deadline for last handin
- More mathematical developments in class and less numerical calculations in the hand-ins in favor of analytical calculations
- Towards the end of the course there were no exercise sessions or exercises handed out
- More clearly formulated exercises
- More about molecules

#### Students appreciated:

- Great exercise classes and hand-ins
- Liked that there is no report for one of the labs
- Liked the use of clickers
- The interaction between the professor and the students during the lectures
- Enjoyed Zeeman and two-electron lab
- Nice with exercises and bonus points as it helps motivating

## **II. Lärarlagets kommentarer**

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

- The written exam this year was a bit too difficult, but overall we feel the changes we implemented is on the right track (see below at point III).
- It worked very well with exercises in K305.
- We did an special effort on the diode-spectroscopy lab this year and it went better. The setup is, however, difficult to use and we need to rethink this lab.
- The new bonus system was too complicated and not communicated clearly in the beginning (in fact the two teacher had a different understanding)
- 4 evaluation forms is really disappointing and it is disappointing that students do not want to engage more in the course development. Next year we will use S&R and do a real effort to get more feedback.
- As teachers we fell it is very difficult to satisfy the need of the teacher students and the normal physics students in one course.

- We agree that the part about molecules could be extended and more exercises on this topic would be very nice. We hope this can be implemented this next year.

### III. Utvärdering av förändringar sedan förra kursen

Last years suggestion in *italic*

- *The written exam this year was too easy resulting in a very high fraction of VG's. The reason for this was that the teacher underestimated the students ability to solve a new type of exercise dealing with molecular bonding. As many students solved this exercise very well and since many students did quite well with the handin exercises this resulted in quite high grades. Next year (and for the re-exam) a few more difficult questions should implanted to give a better grading scale. Furthermore, the correction will be adjusted such that it is harder achieve points. Finally, I consider to use another way counting the bonus points for the exam suggested by one of the course representatives.*

>>> For the physics students we implemented a more difficult exam. Rather than having 4-5 standard exercises we kept two standard exercises, but changed two to exercises where the students had to demonstrated their ability to give a QM description of atoms and molecules and use this to solve problems. As teachers we felt it worked quite-well, even though it became a bit too difficult. Next year the exam should be slightly easier.

- *I should have prepared more of the teaching material well in advance of the course, so I could have focused more on the teaching aspects of the course. This will be done well in advance of next years course. This will hopefully also help me to get better structure of the lectures that the students complain about. Furthermore, the teacher will try to find a colleague that can share the teaching with him, so that there will be more time for preparing each lesson.*

>>> This year the lectures was shared 50:50 between MG and JK and it worked better than last year, but of course the lectures can be improved.

- *Some students commented that the course is quite different (and easier) from the similar course offered by Lars Engström. For next years course and the preparation of the exams this is important to address.*

>>> See point above

- *As a teacher I felt I used to much time on derivations on the white board and two little time on discussing the underlying physics. This was discussed with the course representatives. We agreed that the focus for next year should be to try to more efficient on the whiteboard and maybe skip a few derivation steps (and distribute full derivations via Live@lund) such that I get more time for discussing physics and using powerpoint slides.*

>>> Derivations were distributed with Canvas, but it can still be improved.

- *I also felt that I should have motivated many of the aspects we discussed by highlighting where we observe these effects in nature. For next years version of the course I plan to put focus on this.*

>>> Unfortunately, we did not get much done here this year.

- *Having the exercises in lecture hall D is not ideal. I will discuss with UDIF if a fraction of the lectures can be moved to a room better suited for solving exercises.*  
>>> We moved exercises to K305 this year, which worked really nice.

#### **IV. Förslag till förändringar till nästa kurs**

- We will use S&R for course evaluations next year.

2019-03-04, sammanställt av Jan Knudsen (teacher)

*Sammanställningen skickas till [Johan Rathsman](#)*