

Course analysis for Basic Quantum Mechanics, FYSB11 and ÄFYD03 VT 2020

Course responsible: Peter Samuelsson, Patrik Eden

Other teachers: Smita Chakraborty, Ekin Önder, Andrew Lifson, Athanasios Tsintzis.

Number of students registered: 45 (38 Ladok students, 3 students, 4 Ladok students & students according to Canvas classification)

Course representative: Due to the exceptional circumstances during the early days of the pandemic, no course representative was elected (the course responsible did not remind the students to elect a course responsible.).

Grades: On the ordinary exam the results were U - 0, G – 12, VG - 9. The re-exam has not yet been given. This is a statistically a slightly better result than an average year.

Analysis

I. Summary of the course evaluations

Total number of responses: 18 out of 41, giving 44% responses.

Short summary of the results: Due to the Corona pandemic and the distance teaching, the conditions for the course was completely novel and the results hard to compare to earlier years. Still, overall the students were satisfied (grade 4.7, roughly average a normal year).

The overall impressions of the lectures, the book, the experimental and computer labs and the exercises were positive. However, a number of students were critical about the Zoom-based exam, in particular the requirements for personal IT equipment and the surveillance-like situation during the exam. Compared to earlier years, the assessment of the computer lab was more positive, possibly an effect of the large revision performed of the lab.

II. Comments and reflections from the teachers

The teachers felt that given the daunting task to adapt the course to distance teaching, with pre-recorded lectures, Zoom-based exercise and laboratory work, and an exam on Zoom, the course went surprisingly well. No major remote technology related problem occurred and the teaching platform Canvas worked reasonably well for full scale distance teaching. This overall assessment seems to be shared by the students, the course overall received good marks. Moreover, maybe surprisingly, the exam results were equally good or slightly better than a typical normal year.

A clear shortcoming of the distance teaching methods applied by the teachers was the limited student feedback, both in real-time and after publishing lectures. To large extent, the teachers were therefore in the dark concerning the impression of the students during the course. The teachers will put large emphasis on improving this aspect for the next time the course is given. Moreover, just as the students, the teachers were not happy about the format of the exam. Despite all security measures, sometimes with a non-negligible

personal integrity impact, it was effectively impossible to guarantee the same level of security as in a regular in-person exam.

Concerning the course, some students pointed out that the more mathematical part of the course was difficult and sometimes hard to follow. The teachers largely agree with this assessment. In the new educational plan for Physics, a number of the key mathematical tools needed, for example Fourier transformations, are presented in another course such that the students have the necessary pre-knowledge when encountering the concepts in the Quantum Mechanics course.

The assistants who commented on the student evaluations largely agreed with the comments of the students. For the exercises, the assistant felt that the response on Zoom exercise sessions were positive, but in many cases, the students needed some suggestions for extra reading. For the experimental labs, the assistant agreed that the lab sessions were not optimally constructed but felt at the same time that, given the conditions, the assistants did what they could in order to be helpful. For the computer lab, the assistant noted that the students were pretty scattered in their assessments.

We note that the student groups taking the course in the spring semester and in the fall semester are partially different, both in amounts and background/character. In the spring, typically one third to one half of the group of the students participating actively are physics teacher students and most of the remaining students are international, exchange students. In the fall, typically there are twice as many students following the course, with the overwhelming majority Swedish physics students, not in a physics teacher program. When comparing course assessments it is therefore advisable to consider spring and fall semesters separately.

III. Evaluation of changes since last time the course was given

Since last time the course was given we have considerably revised the computer lab, trying to make it better adapted to the course and requests from the students. We can conclude from the responses of the students that these changes led to a more positive assessment.

IV. Suggestions for modifications and measures until the next time the course is given

Until the next time the course is given our ambition is to develop, learn and implement methods to improve the feedback from and interaction with the students, during the course. This suggestion assumes that the course is again given remotely the next time. In addition, for all the exercises and labs, the assistants will, based on the student feedback, try to modify their respective activities to function better in a remote setting.