

Kursanalys för SK2560

Datum för kursanalysen	2021-12-21
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Sida 1: Kvantitativ analys

Läsår:	2021
Läsperiod(er):	1

Kursansvarig:	Haichun Liu / Jerker Widengren (examinator)
Lärare: Föreläsare	Haichun Liu
Övningsassistenter	Haichun Liu
Labbassistenter	Niusha Bagheri, Haichun Liu
Övriga inblandade lärare	

Antal registrerade studenter	11 master students, 1 PhD student (FSK3560)
Prestationsgrad, * % (t.o.m. ovan datum)	95.6 %
Examinationsgrad, ** % (t.o.m. ovan datum)	91.7 % (100%)

* Antalet presterade poäng hittills på kursen dividerat med antalet möjliga poäng för de registrerade studenterna vid gällande datum.

** Andel studenter av de registrerade som klarat samtliga kurskrav vid gällande datum.

Sida 2: Kvalitativ analys

Kursens pedagogiska utveckling

Redogör för eventuella förändringar införda utifrån förra årets kursanalys.

In 2020, I got some assistance from another teacher in teaching, who gave four (out of fifteen) lectures. Since 2021, I am the sole teacher for this course. Based on the course evaluation in 2020, this course has been developed in the following aspects in 2021.

Development of course structure and lecture notes. This year, I made substantial adjustments to the order of lectures to make them in a more logical manner. In addition, a preview was given at the beginning of each lecture. Reading instructions were provided to the students well in advance to each lecture.

Development of the computer lab (quantum well infrared photodetector). This year I wrote a more instructive manual for the computer lab, replacing the former one written by the former course responsible teacher.

Development of the examination. This year, an oral exam (20 min) was introduced to supplement the examination. The students were mainly asked to give an overview of the whole course in order to assess and enhance their holistic view of the knowledge.

Studenternas syn på kursen

Redogör för studenternas syn på kursen (dokumenterad genom kursenkät, kursnämndsmöten, intervjuer och/eller annan lämplig metod).

This year this course was given in a hybrid class, on Zoom and in a classroom on place. Due to the Covid-19 pandemic, most students took the lectures online.

After completing the course, the students answered a questionnaire. In 2020, I inherited the course-evaluation template that I got from the former teacher. This year, in order to nail down issues more accurately to help me improve this course, I modified the course evaluation template to include more specific questions on each element of this course, including lectures, lab exercises, home assignments, research article presentation, course organization and communication, and exam. On a scale of 1-5, the students' assessments are on average 3.7, concerning both relevance/content and presentation of most of the elements. On the course organization, communication, and structure, I got a few complaints in the course evaluation in 2020. Based on these complaints, some changes were introduced and this year, no similar

complaints were received.

The general response is that the students find this course interesting and appreciate this course. Below is a summary of the general opinions of the students from the "Course evaluation" questionnaire (9 participants):

Home assignments: Most students thought the home assignments kept them continuously work on the course, helped understand the content of the course and facilitated the learning. Very few students thought it might be too much work.

Research article presentation: All participants expressed that they liked the research article presentation, and thought that the presentation was interesting, helped deepen the subjects and provided examples for how to apply the knowledge.

Exam: All participants thought that the exam was at a reasonable level and reflected the course contents well.

Interactive parts: Some students, but not all, would like to see more interactive parts during the lectures, such as exercise sessions with a teacher in a classroom.

Most participants think that **the contents and length of the course** well corresponds with the credits.

What are mostly appreciated by the students about the course:

- "I especially appreciated the labs. It was good to work with the concepts acquired from the lectures and good for the understanding to write about them."
- "I think this is a very interesting field and it was fascinating to hear what is possible to do with nanophotonics."
- "The confocal lab, and the article presentation."
- "Homework's and professor availability."
- "The second laboration and the presentation."
- "To learn about light-matter interaction."
- "I liked the description of the quantization of the electromagnetic waves and the light matter interaction, and the following calculations of the consequences of it. Perhaps even more focus could be placed on this part."

Below are some general comments and reflections from the students on the course:

- "I appreciated much this course. It was somewhat hard to understand the mathematics but I think this could be facilitated by including more exercises on derivations and on concepts."
- "Overall I think the course was very good. I liked the content! Although, maybe better

to explain the concepts instead of derive certain expressions, in some cases.”

- “Thank you for the course!”
- “I overall appreciated the course even though I would have liked some more insight in equations sometimes.”
- “I have not read any Solid State Physics course and believe it maybe would have been more easy to follow if I had done that. Maybe there is some way to bridge the gap for the student that don't have that background and maybe at the start of the course present some key concept that the students should be familiar with or read more about during the first week to help them through the course.”
- “This was a very interesting course and the subject is very relevant!”
- “Sometimes the lectures were a bit fast and skipped over many details so that they seemed a bit hard to follow or messy.”

In addition, the students gave me very valuable comments which can help me further improve this course in the coming year.

Suggestions to improve the course:

- “Powerpoints need improvement. Most slides now are just walls of equations, which make it really difficult to follow along and pay attention. If we are talking about a phenomenon, first explain it with intuition etc. before going into the math. And if we are deriving an expression, I feel like it works better if the teacher is writing on the board instead of showing a slide. This is both due to the fact that the teacher can't move too quickly as they also have to write everything (meaning I get enough time to write it down as well) and due to not getting blasted with a wall of letters and numbers at once.”
- “Include suggested problems which could be solved in class or the problems could be chosen in books where there are solutions.”
- “Sometimes when you say you will explain something more extensive you are just repeating yourself. Maybe it is hard to explain in another way but it does not help to say something twice.

There is very hard to follow when you have long expressions on the powerpoint. It is better to write on the whiteboard. In this way, the pace will be better and it is easier to understand every step.”

- “Exercise sessions with the teacher in a classroom.”
- “Spend more time on the meaning of things during lessons.”
- “I had troubles following the lectures - it might be because I had a lot of other things going on and had to take the lectures online. I think it would be easier to follow the

content if a description of why we are looking at the different things and what the end result will be was given at the start of each lecture. Doesn't have to be a very long introduction but something along the line of

"Now we will look at transition matrix elements which describes ... and are important when The expression we will derive is ... by start to look at"

I think it would make it easier to follow along during the lectures."

- "Work on making the lectures easier to follow and think about removing assignments that are not relevant."
- "Maybe some of the homeworks could be group hand ins, since discussing solutions with a group can be useful for learning."

Kursansvarigs syn på kursen

Sammanfatta hur utförandet och resultatet av kursen gått, samt tolka/analysera studenternas syn på kursen.

Both based on the questionnaire and direct contact with the students, I could further confirm some successful parts of this course, as summarized below:

- The subject and course materials are interesting.
- Home assignments and labs keep students work continuously.
- The confocal lab is very good and a lot of fun.
- The research article presentation is a lot of fun and provides insight into contemporary fields.

In addition, it is reflected that significant improvements have been made in the course communication, organization and structure. This year, I made substantial adjustments to the order of lectures to make them in a more logical manner. In addition, a preview was given at the beginning of each lecture. A reading instruction was also provided to students prior to each lecture. It turns out that such adjustments are successful. Complaints on these aspects have disappeared. In addressing the students' comments on the computer lab that I got from the course evaluation in 2020, I wrote a more instructive manual for this lab. All students did a quite good job in the computer lab, and no similar negative comments were received from the course evaluation this year, proving quality enhancement. With these improvements, the overall grade of this course given by students has increased from 3.2 in 2020 to 3.7 in 2021 on a scale of 1-5.

At the same time, I get very valuable comments on how the quality of this course can be further increased, mainly on several aspects listed below:

- The heavy physics and mathematics (a lot of physical concepts and equations) need to

be addressed better to facilitate understanding.

- Lecture notes may be improved by adding more texts.
- Discussion or exercise sessions with the teacher in a classroom on the homework questions may be included.

I will make changes accordingly to improve the course in the teaching of the coming year. Additionally, I will further improve my lecturing skills. For example, technically, whiteboard can be used more efficiently during lectures to clarify the details of important concepts and control the pace of lectures, in order to facilitate learning of students.

The course has a relatively high degree of examination (91.7%). Of those who took the exam, 100% passed.

Planering inför nästa kursomgång

Redogör för eventuella förändringar du planerar att göra inför kommande kursomgång.

To address the students' comments in the questionnaire and based on the above analyses, some major changes will be made for the next course round in the following aspects:

1. Lecture notes will be improved by adding more texts.
2. Further extend the preview part of each lecture, by adding a brief description of what we are going to study in each lecture, why we need to study such contents, and what the results will be.
3. Important concepts will be given more focus in the course and will be explained more thoroughly during lectures.
4. Discussion or exercise sessions with the teacher in a classroom on the homework questions will be scheduled.