Course Analysis SH2203 – 2013

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Statistics for the Course Evaluation

Number of students: 11 **Number of Evaluations**: 11

Comment: Set aside 15 minutes during the last lecture to fill in course evaluations (before the break, which means that the lecture continued after the break). This ensured that everyone filled it in, and I told them that they should have future students in mind and give feedback on things that could be done better (or that already worked well). It is important to have the last lecture after the student seminar day, so that it can also be evaluated as part of the feedback in the course evaluation.

Focus of the 2013 course (lessons from the previous year)

The first time I gave the course was in 2012, and then I was just using material from the previous course responsible. Much of the course content was also new to me, and home assignments (HA) were also inherited from earlier years. There were many things that I knew could be improved in the course, but time constraints limit how much can be altered in one year. For this year's course, the focus was on improving:

- Change to course literature to be only "Particle Physics" by Martin. Goal for 2014 of doing a review of alternative course literature options.
- Try to get the students to read continuously in the book. This would also allow me to change the content during lectures, as a lot of material could be studied by the students on their own. Action for this year's course: Informing the students that lectures are mainly to delve deeper in material not covered by the book. Every lecture, end with reading instructions for next time and an estimate of the time they had to set aside for this. Try to reference the book during the lectures (the text they read before the lecture), but this can be done better in future years. I was (pleasantly) surprised to see in the evaluation feedback that most students had read almost all reading assignments. This change was motivated by taking LU1, and realizing that the important thing for student learning is to get the students to actively work themselves during the course.
- Reduce the number of topics covered during the lectures, and shifting the focus to give an introduction to how modern gauge theories are constructed. This forced major revision of the lecture material, although a lot is still borrowed from earlier years I now have all slides made by myself. It is hard to do justice in this text to how big this change was, in essence I tried to really limit the overlap with the subatomic physics course by not reviewing the basics of the standard model again (they got to read it in the book anyways) and instead spending a lot of time going through the gauge transformations of the forces and the essence of the electroweak unification (including the Higgs, or mass, mechanism). I was

really happy how this change worked out. The students were clearly more interested since they got to tackle something completely new to them (the gauge theories). It will be interesting to see if this helps them any when they take theoretical particle physics (the mathematics was not always rigorous, but the ideas where covered in detail). This change was motived by the feedback from the previous year that the students wanted to go into much more details on the real thing, and that there was a lot in the course that they already had heard before.

- Start earlier with the home assignments, this worked well. The background needed for solving the home assignments were no longer covered during the lectures (see bullet above), but I mentioned that they would need to find the information themselves and since most of it is to be found in the course book it worked really well. I saw no drop in ability to solve the problems, the students did not complain about not getting the background during the lectures and it really freed up time for me to cover other things in the lectures. This change was motivated by the feedback from the previous year (and my own experience of being late with the HA) that it would be better to start with HA earlier.

- I removed one component of the student seminar day, which consisted of the students giving each other grades on their presentations. That component was the one receiving the most criticism in the evaluation from the previous year, and although it may have some pedagogical merits (keeping the students listening attentive and training them in assessing others) the students clearly hate it (they want me to grade them). Instead I introduced a new component, each student had to write a 2 page report on their own topic to hand in one week before the student seminar day and then we swapped essays and they had to be "opponent" for a fellow student during the seminar day (i.e. prepare at least two or three questions for the speaker). When asking the students to evaluate this new component the response was only somewhat positive, which surprised me since I thought it really worked well myself. The students were forced to start finding material for their talk in advance (to write the report) and they also came up with very good questions for each other. Not sure why they didn't like this component, but I will keep it for future years.

The course evaluation form

The idea was to keep the questions as open as possible to get broad feedback. Some targeted questions to get feedback on the new additions to the course where also added. The course evaluation form can be found in the attachment.

Summarizing the main points of the feedback

The students were very positive in their feedback, everyone crossed either a) or b) in the overall impression. In the free comments, one student wrote "This was the best course ever!" and four other students wrote similar sentences in their comments. So the course was well received, with very little negative critique directed at any of the parts of the course. I would say that there were not many

truly constructive comments that would necessitate changes in the upcoming years. One such comment though was to make the choice of course literature more in advance of the start of the course, which will of course be the case next year (the homepage is already updated with this information). I will try to make a review of course literature for next year; if I find any other book I would like to use I have to announce it well in advance on the home page.

Focus points for future years

I would like to review the home assignments and while they are very good they at least need to be modernized (the field is developing rapidly and it would be good to reflect that in the home assignments). New data from the LHC could be used. Another thing to look into is to update the course literature. Need a better explanation of the Higgs mechanism. Finally, the course home page can really be improved, although some improvements happened already this year.

Attachment 1 – Evaluation Form

Course evaluation

SH2203 Experimental Particle Physics (2013)

Have you done most of your studies at KTH or are you a visitor?

(a) KTH

(b) Visitor

What is your overall impression of the course?

(a) Very positive

(b) Quite positive

(c) Neutral

(d) Quite negative

(e) Very negative

Comment:

Has there been much overlap with other courses?

(a) Far too much

(b) Some overlap, but it was useful to review the topics again

(c) Some overlap, which was mostly unnecessary

(d) No overlap

Comment:

How challenging has this course been compared to other courses you have recently taken at KTH?

(a) Much more challenging

(b) More challenging

(c) About the same

(d) Less challenging

Comment:

What are your thoughts on the reading assignments? How many did you read, and did you find it useful to read before the lectures?

Comment:

What did you think about the amount of material presented during each lecture?

(a) Too much!

(b) About right

(c) Too little

Comment:

What did you think about the home assignments (difficulty and schedule)?

Comment:

What did you think about the home assignments (as a learning aid)?

Comment:

Is it a good idea to have student presentations?

Comment:

What are your thoughts on the report you had to write before the seminar, and the task of being “opponent” for one of you fellow students? Did you find it useful?

Comment:

Any other comments / suggestions for improvement?