

SK2758 – Solid state physics, 7.5 credits

Course analysis - Spring 2023, period 4

Course analysis performed by

Magnus Andersson (examiner)

Teachers:

Magnus Andersson (examiner, course responsible, lecturer)

Alexander Edström (lecturer)

Frank Elson (tutorials)

Ugne Miniotaite (X-ray laboratory work)

Nezhat Pournaghavi (band structure laboratory work, lecturer)

Course design

The course consists of lectures, tutorials and laboratory work (with two labs – one on X-ray diffraction and the other on band structure calculations). The course is examined through four quizzes in Canvas (TEN3), a normal written exam (TEN2) and a separate examination with written lab reports (LAB1). This year, the lecturing was divided between two lecturers (Magnus Andersson and Alexander Edström) and one lecture related to the laboratory work given by Nezhat Pournaghavi. The laboratory instruction on the band structure laboratory work was updated. These changes seem to have worked very well and the work done during the last year's to modernize the band structure laboratory work now seems to have reached a good point.

Student workload

The course has 7.5 hp (200 h) during period 4 and the students state that they have spent a reasonable amount of time on the course. This looks normal for the course and since students sometimes underestimate their workload, there are no reasons for change.

Study results

The course had 37 registered students among which 28 were active in some way during the course. The results on the different parts were as follows:

Ladok code	LAB1	TEN2	TEN3	Full course
Passed (Active)	23 (23)	22 (28)	22 (27)	19 (28)
Percentage	100 %	79 %	81 %	68 %

The grades on TEN2 were distributed as follows:

A: 3 students B: 6 students C: 7 students
D: 0 students E: 6 students F: 6 students

The results are comparable to earlier years.

Results from student questionnaire

8 students out of 28 active students answered the student questionnaire, which was distributed via Canvas after the course. Students were in general very satisfied with the course and the way it was given. All respondents except one considered the course to be better than average courses at KTH and half of the estimated it to be considerably better than an average course at KTH.

All parts of the teacher led education in the course were appreciated (considered as good or very good) by the students and there were only very few suggestions for improvement. These few suggestions were (each from one single student):

- 1) Give a more thorough review of the course on the first lecture
- 2) Replace the quizzes with a partial exam (KS) giving points on the final exam
- 3) Do not cover material from the elective course in statistical physics
- 4) Make the course mandatory for all physics students
- 5) One of the X-ray equipments malfunctioned during the lab
- 6) Do not reduce so many points for (small) errors on the exam

Among these suggestions, the first one could be considered but there is already some material concerning this on the first lecture. Suggestions 2-4 are known to depend on the views of different students and since the course in statistical physics is not mandatory, we need to introduce students who have not had that course before to some parts of statistical physics. Suggestion 4 is a programme decision, which is not controlled by the course, suggestion 5 is something that can occur in a laboratory environment (so we can handle it) and suggestion 6 will not be implemented since students are responsible for checking their own answers.

All teachers in the course have been appreciated and I found no negative criticism except for some minor details (as indicated above), which were only expressed by a single respondent. Based on the responses in the questionnaire, it is this year instead adequate to highlight the excellent work of some of the teacher assistants:

- Ugne Miniotaite for her work during the X-ray laboratory. Two of the eight respondents actually praised her good work in particular.
- Frank Elson for his work during the tutorials. All answers were very positive without any negative details at all.

Prioritized course development

There are no obvious points of improvements. Two possible point to consider is to rethink how the subject is presented on the first lecture and how to better balance the overlap between this course and the elective course in statistical physics.