SK2759 – Superconductivity and applications, 6.0 credits

Course analysis - autumn 2019

Basic information

The course was given in period 2, autumn 2019, and had 11 active students. Course responsible was Magnus Andersson. The course has two parts:
KON1 (3.0 credits): Three short individual exams during the course
INL1 (3.0 credits): Group assignments based on home hand-in problems (50%) and on evaluations of two suggested superconducting applications (50%).

Aims

The aim of the course is to give basic knowledge about superconductivity and its applications. The lectures aim at presenting the theory and the applications with a special emphasis on explaining the connections between theory and applications taking an engineering perspective on the subject. The KON1 part tests the individual knowledge in the course and the INL1 part tests the student's ability to work together in solving problems and their ability to work together to shortly evaluate the feasibility of a suggested application using a broad scope of knowledge and finding all relevant factors to consider in the problem (technical as well as environmental, societal and safety aspects and competing technologies).

Pedagogic development

The chapter on the basics of BCS theory was somewhat extended for this year and the grading of the hand-in problems were slightly changed. The latter seems to have had the expected effect of better using the total grading scale.

Quantitative data

All students were active on the course and have now passed it.

Course assessment

The students were asked to answer a short questionnaire after the course. 6 students out of 11 answered the questionnaire.

General conclusions

Students are in general quite satisfied with the course and 5 students out of 6 rated it as "Very good" and were positive both concerning course literature and lectures. One student even noted that "It's the best course I had at KTH!". Comments asking for change in the course were

- The individual part of the examination should count more than they do for the final grade.
- One student was missing a conceptual description of superconductivity (which are hard to give)
- Spend more time on BCS theory.

Course material

The course material seems highly relevant for the course.

Examination

The examination method seems to be very relevant for this type of course.

Summary for next year's course

The course will be replaced by the course SK2905 Superconductivity and other quantum liquids during next academic year. Some material from this course will be re-used, but some need also to be developed. The examination in the new course will also be somewhat different, putting more emphasis on the individual parts (the individual written examination in SK2905 is making up for 60% of the course instead of 50% in SK2759)