



# IM2602 Solid State Physics, Extended Course 3.0 credits

Fasta tillståndets fysik, tilläggskurs

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for IM2602 valid from Autumn 2009

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

Second cycle

## Main field of study

Engineering Physics

## Specific prerequisites

IM2601 (participation).

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

The extended course gives a deeper knowledge within a few areas of solid state physics. Through a few selected examples, the students will become familiar with the principles behind modern methods within the field. The examples are chosen to include both experimental and theoretical aspects and also give connections to important technical areas of applications.

After the course the students should be able to:

- review the physics determining a complete X-ray diffractogram and be able to use the Rietveld method to carefully extract the lattice parameters of a polycrystalline material
- review some methods for band structure calculations and their background and also by themselves make a simple band structure calculation
- review some applications and their connection to basic physical phenomena within a few selected areas of solid state physics, like e.g. semiconductor technology, nanotechnology, superconductivity, magnetism, surface physics, optical properties, optical materials, metallography etc.

The choice of areas can vary between years and will to some extent be decided together with the students. Specific course objectives for these parts will be distributed at the lectures.

## Course contents

X-ray diffraction, Rietveld method, band structure calculations, some applications in solid state physics.

## Course literature

Charles Kittel, Introduction to solid state physics, 8th edition, John Wiley and Sons Inc. (2005), ISBN: 978-0-471-41526-8.

Material från kursansvarig.

## Examination

- ANN1 - Report, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Home assignments (ANN1), 1,5 credits and laborative work (LAB1) 1,5 credits.

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.