



# IH2658 Semiconductor Theory and Device Physics, Advanced Course 6.0 credits

Halvledarteori och komponentfysik, fortsättningskurs

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

## Establishment

Course syllabus for IH2658 valid from Spring 2019

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Physics

## Specific prerequisites

Course IH2651 or IH1611.

## Language of instruction

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

## Intended learning outcomes

After completion of the course the student will

- Know the physics of semiconductor junctions, metal-semiconductor junctions and metal-insulator-semiconductor junctions.
- Know the physics and application of semiconductor hetero junctions and quantum-confined structures.
- Understand the fundamental principles and applications of modern electronic and optoelectronic semiconductor devices.

## Course contents

Initial lectures will treat the last nine chapters in the book of Balkanski and Wallis (used for “Semiconductor physics and device theory, basic course” IH2651), or similar material. The content of these chapters are the pn-junction, bipolar transistor, field effect transistors, properties of semiconductor hetero junctions, quantum wells, and semiconductor lasers and photo-devices. In addition, the students should complete a literature study of their own choice. The individual project should be presented orally to the other students in the group.

## Course literature

Semiconductor Physics and Applications, M. Balkanski and R.F. Wallis  
Upplaga: Förlag: Oxford University Press  
År: 2000  
ISBN: 0 19 851740 8  
**Övrig litteratur** Vetenskapliga artiklar

## Examination

- INL1 - Assignments, 6.0 credits, grading scale: A, B, C, D, E, FX, 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.

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

## Other requirements for final grade

Home assignments (INL1; 6.0 hp)

## 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.