



FIH3607 Epitaxy of Semiconductor Materials 10.5 credits

Halvledarepitaxi

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 FIH3607 valid from Autumn 2007

Grading scale

Education cycle

Third cycle

Specific prerequisites

Basic physics and chemistry courses

Language of instruction

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

Intended learning outcomes

This course will give an advanced level treatment of crystal growth basics, methods of instrumentation for thin-film epitaxial growth, as well as an orientation of specific materials systems of interest for a range of micro- and optoelectronics applications.

After a successful completion of the course, students should be able to:

- . Describe fundamental processes of crystal growth taking account of both thermodynamic and kinetic aspects
- . Describe the liquid-phase epitaxy (LPE) process
- . Describe the hydride vapor-phase epitaxy (HVPE) process
- . Describe the metal-organic vapor-phase epitaxy (MOVPE) process
- . Describe the molecular-beam epitaxy (MBE) process
- . Describe the process and applications of selective area growth (SAG)
- . Understand the basic fundamentals for the numerical modeling of the epitaxial process
- . Describe the properties and applications for a range of compound semiconductor materials, including those based on the GsAs, InP, SiC, SiGe, GaN systems, as well as nanostructured materials.

Course contents

The course provides an introduction to crystal growth technology with several examples of technical implementations as well as specific materials systems. The fundamentals of the crystal growth process are reviewed as based on gas kinetics, deposition theory and thermodynamics, and a number of thin-film epitaxial processes are described in detail.

Course literature

Udo W.Pohl, Epitaxy of Semiconductors, Springer, 2013 samt utdelat material

Examination

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.

Participation in lectures and seminars, own topical seminar, home assignments

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.