FIH3604 Silicon Carbide Electronics 7.5 credits

Kiselkarbidelektronik

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

Establishment

Course syllabus for FIH3604 valid from Spring 2014

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Semiconductor Devices

Language of instruction

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

Intended learning outcomes

The student should be able to write the introductory chapter on silicon carbide for the licentiate or doctoral thesis.

Course contents

- Material Properties
- Crystal structure and Polytypes
- Mechanical properties
- Electrical properties
- Defects
- Process Technology
- Bulk material growth
- Epitaxial growth
- Ion implantation
- Silicon carbide etching
- Dielectrics
- Metals
- Device Design
- Two terminal devices (Schottky and pin diodes, LEDs, Sensors, resistors, capacitors)
- Three terminal devices (BJT, JFET, MOSFET, IGBT, GTO)
- Circuit Design
- High voltage design
- High temperature design
- Applications

Course literature

Zetterling, C.-M., Editor, Process Technology for Silicon Carbide Devices, IEE EMIS Processing Series 2, ISBN 0-85296-998-8, 2002.

OR

Saddow, S.E. and Agarwal, A., Editors, Advances in Silicon Carbide Processing and Applications, Artech House, ISBN I-58053-740-5, 2004.

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.

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

Grading scale: Pass/Fail

Other requirements for final grade

Finished introductory chapter on silicon carbide electronics for Licentiate/Doctoral thesis

Seminar attendence

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.