

Syllabus

for course at advanced level

Solid State Electronics

Fasta tillståndets elektronik

7.5 Higher Education

Credits

7.5 ECTS credits

Course code:	FK7005
Valid from:	Autumn 2007
Date of approval:	2006-09-27
Department	Department of Physics
Subject	Physics
Specialisation:	A1F - Second cycle, has second-cycle course/s as entry requirements

Decision

Prerequisites and special admittance requirements

Physics II (FK4005), 30 HECs. Also required is knowledge equivalent to Swedish upper secondary course English B.

Course structure

Examination code	Name	Higher Education Credits
1100	Solid State Electronics	7.5

Course content

This course introduces important topics in solid state physics and applies them to electronic components such as diodes, transistors and opto-electronic devices. Topics include crystal lattice structure, charge carrier generation and recombination, mobility, etc. PN-junction characteristics are covered in some detail and applied to diodes, photo- and solar cells, LEDs and semiconductor lasers. Bipolar transistors are also studied, as well as different field-effect transistors. Lab exercises with different diodes and transistors provide concrete demonstrations of important topics.

Learning outcomes

After having passed the course the student is expected to:

- * understand and be able to use fundamental concepts like semiconductors, carrier concentrations, diffusion, mobility, doping, recombination etc.
- * understand PN-transitions and be able to calculate their properties
- * understand and be able to describe different transistors, calculate bipolar transistor and FET-properties
- * understand different optoelectronic circuits such as LED, photodiodes and semiconductor lasers

Education

The education consists of group education and laboratories.

Participation in the laboratories is compulsory. An examiner may rule that a student is not obliged to participate in certain compulsory education if there are special grounds for this after consultation with the relevant teacher.

Forms of examination

- a. The student's knowledge will be tested by written and/or oral presentations of the laboratory exercises.
- b. Grading is carried out according to a 7-point scale related to learning objectives:
A = Excellent
B = Very Good
C = Good
D = Satisfactory
E = Sufficient
Fx = Fail
F = Fail
- c. Grading criteria for the course will be distributed at the start of the course.
- d. A minimum grade of E is required to pass the course.
- e. Students who fail to achieve a pass grade in an ordinary examination have the right to take at least further four examinations, as long as the course is given. The term “examination” here is used to denote also other compulsory elements of the course. Students who have achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have failed to reach a pass grade on two occasions have the right to request that a different teacher be appointed to set the grade of the course. A request for such appointment must be sent to the departmental board.

Interim

Students may request that the examination is carried out in accordance with this syllabus even after it has ceased to apply. This right is limited, however, to a maximum of three occasions during a two-year-period after the end of giving the course. A request for such examination must be sent to the departmental board.

Limitations

The course may not be included as a part of a degree together with the course FY3990.

Misc

The course is given as an individual course.

Required reading

Course literature is decided by the departmental board and is described in an appendix to the syllabus.