

Semiconductor for Solar Energy Conversion, 6.0 credits

Halvledare för solenergiomvandling, 6.0 hp

Third-cycle education course

6FIFM02

Department of Physics, Chemistry and Biology

Valid from: Second half-year 2024

Approved by

Approved

Registration number

Entry requirements

Entry requirement for studies on third-cycle education courses

- second-cycle degree,
- 240 credits in required courses, including at least 60 second-cycle credits, or acquisition of equivalent knowledge in some other manner

Learning outcomes

This course focuses on the fundamentals of semiconductor for understanding photovoltaic and photoelectrochemical solar energy conversion.

This course is designed for the PhD students and other students such as master students who are interested in this field

Contents

The course will cover the following topics:

- Introduction of Photovoltaic and Photoelectrochemical Solar Energy Conversion
- Energy Bands and Carrier Concentration in Thermal Equilibrium
- Carrier Transport Phenomena
- Semiconductor p-n Junction and Schottky junction
- Semiconductor Solar Cell
- Principles of Photoelectrochemical Solar Energy Conversion

Educational methods

Educational methods applied in this course are lectures

Examination

Before each lecture students will get an assigned text to read. At the start of each lecture, there is a pre-lecture quiz around 15 minutes on the content of the upcoming lecture.

After each lecture, a set of home assignments will be given. The home assignment will be handed in at the latest at the start of the next lecture.

There will be no written exam. But the final grade (pass) will be given based on how well you performed in the continuous quizzes, homework assignments and discussions in the course. Thus, the participation and discussions would be mandatory.

Grading

Two-grade scale

Course literature

The course will be based on some book chapters, mainly from S.M. Sze, "Semiconductor Devices, Physics and Technology", 2nd edition.

General information

The course is planned and carried out according to what is stated in this syllabus. Course evaluation, analysis and suggestions for improvement should be fed back to the Research and PhD studies Committee (FUN) by the course coordinator.