



*Course syllabus*

# Kraftelektronik Power Electronics

**ETEF10, 7,5 credits, G2 (First Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED E

**Date of Decision:** 2023-04-11

## General Information

**Compulsory for:** IEA2

**Language of instruction:** The course will be given in Swedish

## Aim

The aim of this course is to give the students the basic knowledge about the components and systems used in power electronics.

## Learning outcomes

### *Knowledge and understanding*

For a passing grade the student must

- be able to explain and use concepts used in power electronics.
- be able to explain the function of different rectifiers and converters.
- have knowledge about HVDC.

### *Competences and skills*

For a passing grade the student must

- be able to calculate the parameters that are necessary to choose components needed in power electronic systems.
- be able to plan and perform measurements in power electronic systems.
- be able to plan a power electronic system due to given conditions.

### *Judgement and approach*

For a passing grade the student must

- be able to judge the suitability and characteristics for a power electronic system from a general point of view,
- have gained the self confidence to appreciate the structure of various power electronic systems,
- have gained the self confidence to make certain measurements and calculations on a power electronic system.

## Contents

- Switch mode power supplies.
- Line-commutated rectifiers
- Load-commutated inverters
- Self-commutated inverters.
- Applications
- HVDC
- Static converters
- Transistor drive circuits and protective circuits (snubbers)
- Passive components and filters
- Semiconductor losses and thermal management.
- Standards (overview)

## Examination details

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** Grade 3: passed written examination, passed laboratory preparation reports, passed laboratory experiments. Grade 4 and 5 is based on the result of the written examination.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

### Parts

**Code:** 0113. **Name:** Power Electronics.

**Credits:** 6,5. **Grading scale:** TH. **Assessment:** A passed written examination gives the grade 3 or higher.

**Code:** 0213. **Name:** Laboratory Works.

**Credits:** 1. **Grading scale:** UG. **Assessment:** Passed laboratory preparation reports and passed laboratory experiments.

## Admission

### Admission requirements:

- Passed laborations in EITA40/ETE604 Circuits and measurements

**The number of participants is limited to:** No

## Reading list

- Williams, BW: Power Electronics, Devices, Drivers, Applications and Passive Components. 2006, ISBN: 9780955338403.

## Contact and other information

**Course coordinator:** Univ adj Bengt Simonsson, Bengt.Simonsson@iea.lth.se

**Course homepage:** <https://www.lth.se/iea/utbildning/kurser-paa-campus-helsingborg/kraftelektronik/>