

**SYLLABUS**

# **Electrical Devices 7.5 credits E7033E**

**Elektriska apparater**

**Course syllabus admitted: Spring 2024 Sp 3 - Present**

**DECISION DATE  
2023-06-16**

# Electrical Devices 7.5 credits E7033E

## Elektriska apparater

### Second cycle, E7033E

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Elektroteknik	Electrical Engineering

### Main field of study

Engineering Physics and Electrical Engineering, Energy Engineering

## Entry requirements

Knowledge in electrical circuits corresponding to E0016E Electrical Circuits and Power Networks 7.5 credits or equivalent.

Good knowledge in English, equivalent to English 6.

## Selection

The selection is based on 30-285 credits

## Course Aim

After completing the course, the student shall have knowledge of magnetic circuits, including the basics of magnetism, magnetic materials, transformers and electromechanical energy conversion. The student shall also be able to describe the functionality of Li-Ion batteries and associated electronics for charging and operating electrical devices. The student shall be able to describe, analyze and measure electric motors such as three-phase motors and brushless DC motors.

## Contents

- Electricity and magnetism
- Magnetic circuits
- Magnetic materials and B-H curves
- Transformers
- Electromechanical energy conversion
- Rotating electric machines
- Direct current motors and generators
- Alternating-current machines
- The alternator
- The synchronous motor
- The induction motor
- The brushless DC motor
- Introduction to power electronics
- Inverters for wind and solar power
- Electric motor drives
- Control and regulation of electric machines
- Introduction to batteries
- Battery management

## Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The scheduled teaching consists of lectures and mandatory simulation exercises and labs in laboratory rooms. Students are expected to complete a number of mandatory exercises with support of the course material, which are reported prior to simulation/laboratory work.

## Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Theoretical understanding is examined through a written exam with differentiated grades.

Applied as well as theoretical understanding is examined through presentation of completed simulation and laboratory assignments as well as preparatory exercises of theoretical character.

## Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

## Remarks

Can not be used in a diploma together with E0015E.

## Overlap

The course E7033E is equal to E0015E

## Course offered by

Department of Computer Science, Electrical and Space Engineering

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Laboratory work	U G#	3	Mandatory	S24	
0002	Written exam	G U 3 4 5	4.5	Mandatory	S24	

## Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

## Last revised

by Robert Brännström 2023-06-16

## Syllabus established

by Robert Brännström 2023-02-15