

**SYLLABUS**

# **Electricity Networks 2 7.5 credits W7015T**

**Elnät 2**

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

**DECISION DATE  
2023-02-15**

# Electricity Networks 2 7.5 credits W7015T

## Elnät 2

### Second cycle, W7015T

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Elkraftteknik	Energy Technology

## Entry requirements

The course electrical circuit theory or equivalent knowledg

## Selection

The selection is based on 30-285 credits

## Course Aim

After the completion of this course, the student should be able to:

### Knowledge and understanding

- Describe and explain the detailed structure and functionality of the distribution network
- Describe and explain distribution network planning and operation

### Skills and abilities

- With a holistic view, independently and creatively identify, formulate, and perform calculations in distribution networks
- Critically and systematically use knowledge to model, simulate, predict, and evaluate the performance of distribution networks

### Valuation and approach

- Assess opportunities and limitations of smart and conventional distribution networks to solve the challenges associated with electrification

## Contents

- Distribution system structure and infrastructure: mission, organization, regulation, technical features, voltage levels.
- Distribution system components and models
- Unbalanced behavior of distribution three-phase networks
- Distribution system planning considerations
- Distribution system calculations. Short-circuit, voltage drop, other selected calculations
- Impact of distributed energy resources and variable renewable generation on the distribution system
- Distribution system grounding
- Voltage control in distribution networks
- Flexibility resources in the distribution system
- Estimation methods for hosting capacity. Wired and non-wired methods to increase hosting capacity
- Introduction to distribution systems protection

## Realization

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

The course will be given as a combination of pre-recorded lectures, live lectures in a lecture room and question hours via Zoom and/or in a lecture room.

## 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.

Written exam.

## 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.

## Course offered by

Department of Engineering Sciences and Mathematics

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Theory and calculations	U G#	2.5	Mandatory	S24	
0002	Written exam	G U 3 4 5	5	Mandatory	S24	

## Syllabus established

by Mats Näsström, Head of Undergraduate Education 2023-02-15