

**SYLLABUS**  
**STUDY YEAR 2024/2025**

# **Master programme in Electrification**

**Enrollment semester Autumn  
2023**

DATE  
**2022-06-14**

REFERENCE NO.  
**LTU-2141-2022**

DECISION MAKER  
**Tekniska fakultetsnämnden**

## Programme content and structure

The main area of Energy Engineering includes the development of technology and processes for a sustainable energy supply, including, among others, biofuel technology and energy-efficiency in industry and society. The area also includes systems for the generation, transport and use of electrical energy as well as the interaction between electricity networks, electricity generation and electricity consumption. The specialisation, electrification, focuses on electrification as part of the local and global energy system, the electrical energy system, as well as opportunities and limitations in electrification.

During the first year of the programme, courses focus on the core concepts of energy systems, electric power systems and electrification. This provides the appropriate knowledge to continue with more advanced and specialized courses in the second year. In particular, an insight is provided into electrification as a challenge; relevant tools required to address those challenges are provided. The education provides knowledge about electricity production: conversion of energy from other types to electricity, electricity consumption: conversion of energy from electricity to other types, transport of electrical energy: electricity networks and the relation between the electrical energy system (the power system) and the rest of the local and global energy system. Courses in the second year broaden knowledge in the field and prepare the student for the final thesis.

Swedish for beginners is offered next to the regular courses. This course is not included in the degree and those following it will do so in addition to the compulsory courses.

## Credits

120 credits

## Degree

- Degree of Master of Science (120 credits) - Major; Energy Engineering with specialisation Electrification

## Entry requirements

Academic degree of at least 180 higher education credits with a clear technical profile from energy engineering, mechanical engineering, materials technology, civil engineering, mechatronics, electrical engineering, electric physics engineering, physics or related fields. The degree must include 15 credits of mathematics.

Good knowledge of English, equivalent to English 6.

## Selection

The selection procedure is based on academic qualifications, quality and quantity aspects.

### Selection group

Academic: 100%

## Compulsory courses

### Compulsory courses 90 credits

Course code	Course	Cr	Level	Comment
E0016E	Electrical Circuits and Power Networks	7.5	Bachelor's level	
E7033E	Electrical Devices	7.5	Master's level	
F0040T	Sustainable Energy systems	7.5	Bachelor's level	
F7009T	Industrial Energy Processes	7.5	Master's level	
W0030T	Electricity Consumption	7.5	Bachelor's level	
W0031T	Electricity Production	7.5	Bachelor's level	
W7010T	Electricity Networks 1	7.5	Master's level	
W7015T	Electricity Networks 2	7.5	Master's level	
W7016T	EMC, Power Quality and Reliability	7.5	Master's level	
W7018T	Project Electrification 1	7.5	Master's level	
W7019T	Project Electrification 2	7.5	Master's level	
W7020T	Electricity and energy markets	7.5	Master's level	

### Course offered outside the obligatory courses - not compulsory - For non Scandinavian students 3 credits

Selective space is 3 credits. It is mandatory to select elective courses up to the given number of credits. The given number of credits of elective courses listed must be met for degree.

Course code	Course	Cr	Level	Comment
S0046P	Swedish for International Students 1	3	Bachelor's level	Selectable

### Master project 30 credits

Course code	Course	Cr	Level	Comment
W7021T	Master Project in Electrification	30	Master's level	

## Study schedule

### Year of study 1 Enrollment semester Autumn 2023, Is offered in 2023/2024

Study-period	Course code	Course	Cr	Comment
1	E0016E	Electrical Circuits and Power Networks	7.5	
1	F0040T	Sustainable Energy systems	7.5	
1	S0046P	Swedish for International Students 1	3	Selectable
2	W0030T	Electricity Consumption	7.5	
2	W0031T	Electricity Production	7.5	
3	E7033E	Electrical Devices	7.5	
3	W7010T	Electricity Networks 1	7.5	
4	F7009T	Industrial Energy Processes	7.5	
4	W7015T	Electricity Networks 2	7.5	

### Year of study 2 Enrollment semester Autumn 2023, Is offered in 2024/2025

Study-period	Course code	Course	Cr	Comment
1	W7016T	EMC, Power Quality and Reliability	7.5	
1	W7018T	Project Electrification 1	7.5	
2	W7019T	Project Electrification 2	7.5	
2	W7020T	Electricity and energy markets	7.5	
3-4	W7021T	Master Project in Electrification	30	Entry requirements