

## **Master in Electric Engineering, 60 HE credits**

*Magister i elektroteknik, 60 hp*

Programme code: TAMEL

Higher education qualification: Degree of Master of Science (60 credits) with a major in Electrical Engineering

Cycle: Second cycle

Established: 2024-09-03

Established by: Department of Engineering Science

Applies for: Programme start autumn 2025

### **Entry requirements**

Degree of Bachelor of Science in Electrical Engineering or equivalent. Additionally, the Bachelor of Science degree must be comprised of a minimum of 3 HE credits in programming and 15 HE credits in mathematics. English course 6 in the Swedish upper secondary school or equivalent.

### **Language of instruction**

The teaching is conducted in English.

### **Other regulations**

A student who has been admitted to a programme with this programme syllabus is guaranteed a place on courses according to the study plan below, provided that the student follows the programme according to the study plan. The study plan and its courses may however be subject to change, within the framework of the qualitative targets, when revisions of education plans and syllabi are being made. Should the programme involve choosing a specialization, the student is guaranteed a place on courses concerning the chosen specialization.

## Qualitative target

### *National outcomes*

#### **Degree of Master (60 credits) [Magisterexamen]**

##### **Scope**

A Degree of Master (60 credits) is awarded after the student has completed the courses required to gain 60 credits with a defined specialisation determined by each higher education institution itself, of which at least 30 credits are for specialised study in the principal field (main field of study) of the study programme. In addition the prior award of a Degree of Bachelor, a Degree of Bachelor of Fine Arts, a professional or vocational qualification of at least 180 credits or a corresponding qualification from abroad is required.

The requirement of the prior award of a qualification may be waived for a student admitted to the programme without the basic entry requirement in the form of a qualification. This does not, however, apply if a waiver was granted during admission pursuant to the second paragraph of Section 28 of Chapter 7 on the grounds that the qualification had not yet been issued.

##### **Outcomes**

##### **Knowledge and understanding**

For a Degree of Master (60 credits) the student shall

- demonstrate knowledge and understanding in the main field of study, including both an overview of the field and specialised knowledge in certain areas of the field as well as insight into current research and development work, and
- demonstrate specialised methodological knowledge in the main field of study.

##### **Competence and skills**

For a Degree of Master (60 credits) the student shall

- demonstrate the ability to integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information
- demonstrate the ability to identify and formulate issues autonomously as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames
- demonstrate the ability in speech and writing to report clearly and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and
- demonstrate the skills required for participation in research and development work or employment in some other qualified capacity.

##### **Judgement and approach**

For a Degree of Master (60 credits) the student shall

- demonstrate the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work
- demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and
- demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

### Independent project (degree project)

A requirement for the award of a Degree of Master (60 credits) is completion by the student of an independent project (degree project) for at least 15 credits in the main field of study.

### Miscellaneous

Specific requirements determined by each higher education institution itself within the parameters of the requirements laid down in this qualification descriptor shall also apply for a Degree of Master (60 credits) with a defined specialisation.

## Courses that the study programme comprises

Course	Course code	HE credits	Level	Main field of study
Electrical Design of Batteries	EDF500	2,5	A1N	Electrical Engineering
Modeling of Electric Machines	MEM500	5	A1N	Electrical Engineering
Power Electronics and Electric Drive Systems	ELD500	5	A1N	Electrical Engineering

### *Specialization Electrical Vehicles*

Course	Course code	HE credits	Level	Main field of study
Safety When Working on and in Electric Vehicles	SAE500	2,5	A1N	Electrical Engineering
Analysis and Design with Respect to Electromagnetic Compatibility	AEK600	2,5	A1F	Electrical Engineering
Control System for Electric Vehicles	SFE600	5	A1F	Electrical Engineering
Electric Vehicles	ELF600	7,5	A1F	Electrical Engineering
Electrical Solutions of Auxiliary Systems in Vehicles	ELS600	2,5	A1F	Electrical Engineering
Sustainability - Design and Production of Electric Vehicles	HDP600	7,5	A1F	Electrical Engineering

Course	Course code	HE credits	Level	Main field of study
Degree Project in Electric Vehicle Development	EXE801	20	A1E	Electrical Engineering

### *Specialization Electric Power Systems*

Course	Course code	HE credits	Level	Main field of study
Introduction to Power System Simulations	ITK600	2,5	A1N	Electrical Engineering
Economy and Electricity Market	EKE700	5	A1F	Electrical Engineering
Electric Power System	EKS700	7,5	A1F	Electrical Engineering
Electricity Production and Energy Storage	ELE700	7,5	A1F	Electrical Engineering
Power System Automation and Control	ASK700	5	A1F	Electrical Engineering
Regulations, Network Codes and Grid Requirements	RFK700	5	A1F	Electrical Engineering
Degree Project in Electrical Engineering	EXE802	15	A1E	Electrical Engineering

### **Description of compulsory courses**

The study path presents the order and weeks courses in the programme are given. To see the programmes preliminary study path, enter the programme name / programme code at [hv.se/en/student/studies/program-and-course-information/study-path/](http://hv.se/en/student/studies/program-and-course-information/study-path/).

### **Entry requirements within the programme**

- For admission to the course Degree Project in Electric Vehicle Development 20 HE credits, completed results of 15 HE credits within the program are required.
- For admission to the course Degree Project in Electrical Engineering 15 HE credits, completed results of 15 HE credits within the program are required.

### **Work Integrated Learning (WIL)**

Work-Integrated Learning (WIL) has been a part of University West ever since it was founded and is our overarching profile. Our programmes, research, and collaborations all feature a



WIL element, and it permeates all that we do here. Together with our collaborators, who come from private, public, and civic areas of society, we develop and exchange knowledge that will lead to a sustainable world. As a student at University West, you will encounter work-integrated learning in several ways. This may be, for example, in the classroom or lecture hall, in your practical work, or in something you are involved in outside of the university setting. WIL clearly integrates theory and practice. The advantage of WIL is that you earn an academic degree while also gaining work experience, make contacts, and acquire practical competence. You are better equipped for employment, and are prepared for life-long learning, new insights, and cutting-edge research. WIL is part of our programmes and takes on various forms as we continue to develop our methods of integrating theory and practical knowledge.