Aalto University
School of Electrical
Engineering

Aalto Doctoral Programme in Electrical Engineering

Curriculum 2026-2028

The curriculum 2026-2028 applies to students who start their studies 1.8.2026-31.7.2028. Students who have started their studies earlier can also switch to complete their studies according to the new curricula.

If you would like to transfer to the new curricula, please check the ELEC-specific guidelines on how to do it.

About the programme

Programme description

The Aalto Doctoral Programme in Electrical Engineering comprises 14 research fields confirmed by the Academic Committee of the School. The research fields and their descriptions can be found here: https://www.aalto.fi/en/doctoral-education/research-fields-and-supervising-professors-school-of-electrical-engineering.

Intended learning outcomes

Education objectives and intended learning outcomes of the programme

After completing the degree the doctoral student is able to carry out independent and original academic research.

Doctoral education at Aalto University is conducted within a multidisciplinary international academic community that provides opportunities for field-specific and multidisciplinary research, as well as for various forms of education and learning. High quality education, transferable skills training, and network-building ensure the development of the doctoral students as independent researchers and experts of their research fields. The offered communication and language skills training supports the doctoral students to communicate about their research in the national languages Finnish and Swedish or in English.

The education prepares doctoral students for academic careers at top-level institutions. It provides competencies to pursue various career paths also outside of academia, for example working at demanding expert positions or as entrepreneurs.

The doctoral degree is a requirement to serve as a thesis advisor for doctoral students and as an examiner for a doctoral thesis.

General research studies - Intended learning outcomes

Depending on the studies chosen for this module, the doctoral student will be able to

- to comprehend and conscientiously address the fundamental ethical and sustainability considerations associated with their research.
- choose and apply appropriate research methods to the research question at hand
- adhere to the principles of responsible conduct of research (RCR) in both their research work and interactions within the research community
- work collaboratively within a multidisciplinary and international environment, engaging with diverse stakeholders.
- proficiently present their research in both scientific and professional settings.
- identify, utilize and communicate their transferable skills, such as communication, interpersonal skill, project management skills, leadership and pedagogical skills and to work successfully in academic and other professional positions.
- communicate professionally in the national language(s) and/or in English.

Research field studies - Intended learning outcomes

After completing this module, the doctoral student will be able to:

- demonstrate advanced discipline-specific knowledge
- identify essential research methods for their own research and apply them proficiently.
- disseminate research findings through relevant research forums and to the wider public.

Content description

General research studies prepare students for research work, the application of research results and to learn the principles of responsible conduct of research. General research studies can include transferable skill studies.

The research field studies and the doctoral thesis help students to gain comprehensive and in-depth knowledge of their research field and prepare them for the dissemination of research findings.

In addition to the courses taught at the School in Electrical Engineering, the degree can include other courses taught in Aalto University or in other universities, as agreed on in the doctoral personal study plan of the student (DPSP).

The courses included in the research field studies of the doctoral degree must be doctoral level courses or master level courses suitable for the doctoral degree. The doctoral level courses are indicated with the letter L in the course code (e.g. ELEC-L1234) and suitable master level courses are typically indicated with the letter E in the course code and with the letter D in the end of the name of the course (ELEC-E1234 Interesting course D). Also 2 master level courses, without the letter D in the end of the name of the course may be included in the degree (ELEC-E1235 Another interesting course).

Aalto University
School of Electrical
Engineering

In the general research field studies of the doctoral degree, doctoral level courses (letter L in the course code) are suitable for the module. Also other courses indicated to be doctoral level courses (e.g. with the letter D in the end of the course name) can be included in the general research studies module. Additionally, language studies in Finnish or Swedish can be included in this module (maximum 6 ECTS).

Degree structure

Total credits 30 ECTS
General research studies 5-20 ECTS
Research field studies 10-25 ECTS
Doctoral thesis / Licentiate thesis*
*No credits are granted for the doctoral thesis or licentiate thesis.

Degree requirements

You can find course descriptions in Sisu. In your study plan, choose the course and click the course code or search courses by code or name. Learning environments are found in MyCourses through search or after registration in "My own courses".

General research studies

Compulsory courses

Code	Course name	ECTS	Period, teaching language (supplementary language of instruction)
LC-L1000	Research Ethics for Doctoral Students	2	II English or IV English

Examples of other courses suitable for general research studies

Code	Course name	ECTS	Period, teaching language (supplementary language of instruction)
Planning and follow-up of studies (Choose either ELEC-L0902 or LC-L1001)			
ELEC-L0902	Introduction to doctoral studies Highly recommended.	2-3	I-II English, III-IV English
LC-L1001	Introduction to doctoral education	1	II Finnish
ELEC-L0950	Midterm review for doctoral students in the School of Electrical Engineering	2	Any, English, Finnish, Swedish
Conduct of research			

Aalto University
School of Electrical
Engineering

Code	Course name	ECTS	Period, teaching language (supplementary language of instruction)
LC-1333	Navigate your doctoral studies while learning about equity, diversity, and inclusion	3	IV English
LC-L1011	Open Science for Doctoral Students*	1-2	any
LC-L1020	Theory of Science*	1	any
LC-L1021	Impact of research*	1	any
ELEC-D7020	Elements of Sustainable ICT D	5	III-IV, English
SCI-L1010	Scientific Computing Skills	1-5	I-V, English
MEC-E9020	Patents	3	III-IV, English
Science communication and presenting doctoral research			
LC-1331	Presenting Doctoral Research (o) D	3	IV English
LC-1335	Preparing for the Doctoral Defense (o)	1	I English, III English
LC-1336	Popularize your Research (o,w) D	2	2026-2027: No teaching 2027-2028: II English
LC-1350	Writing doctoral research for Engineering and Science	3	I-II English, IV English, V English, summer English
LC-7110	Tieteellinen kirjoittaminen tohtoriopiskelijoille V D	3	IV-V, Finnish
LC-L1017	Asiantuntijaesittämisen valmennus tohtoriopiskelijoille D	3	I Finnish
LC-L1018	Tutkimusraportoinnin tekstiretriitit tohtoriopiskelijoille D	3	I Finnish
LC-L1019	Tutkimustiedon yleistajuistaminen D	5	I-II Finnish
LC-0224	Negotiation skills D	3	I English, III Finnish
LC-0320	Public speaking skills D	3	I, Finnish III, English IV, English V Finnish
LC-0330	Leadership communication D	3	II Finnish, IV English
LC-0521	Impact and argumentation D	3	V English
LC-0531	Public speaking and stage fright D	3	I, English II Finnish, IV Finnish, V English

Aalto University
School of Electrical
Engineering

Code	Course name	ECTS	Period, teaching language (supplementary language of instruction)
LC-0551	Communication skills D	3	I, English III, English, IV English
LC-0561	Interaction in teams and projects	3	II English, IV Finnish
LC-0353	Listening Skills	1	III English
ELEC-L0210	Presenting research at a conference I D**	1	any
ELEC-L0211	Presenting research at a conference II D**	1	any
ELEC-L0212	Presenting research at a conference III D**	1	any
Scientific community and working life skills			
JOIN-L3000	Designing impact	2	IV English
TU-L1030	Designing a Meaningful Doctoral Career	1	IV English
TU-L1040	Making your Research Matter	1	2026-2027: IV English 2027-2028: I-II English, III-V English
BIZ-L3000	From expert to enabler: facilitation skills for researchers	1	II English
LC-L1012	Business Skills for Doctoral Students D*	1	any
LC-L1013	Career Course for Doctoral Students D*	1	any
LC-L1014	Interactive Leadership Skills for Doctoral Students D*	1	any
LC-L1015	Project Management for Doctoral Students D*	1	any
LC-L1016	Writing Research Grant Applications for Doctoral Students D*	1	any
ELEC-L0240	University practices I D**	1-3	any
ELEC-L0241	University practices II D**	1-3	any
ELEC-L0220	Academic advising, B.Sc. I D**	1	any
ELEC-L0221	Academic advising, B.Sc. II D**	1	any
ELEC-L0225	Academic advising, M.Sc. I D**	1-2	any

Aalto University
School of Electrical
Engineering

Code	Course name	ECTS	Period, teaching language (supplementary language of instruction)
ELEC-L0226	Academic advising, M.Sc. II D**	1-2	Any
ELEC-L0227	Academic advising, M.Sc. III D**	1-2	any
ELEC-L0230	Teaching at higher education I D**	1-3	any
ELEC-L0231	Teaching at higher education II D**	1-3	any
ELEC-L0232	Teaching at higher education III D**	1-3	any

Pedagogical studies			
PED-9011	A! Peda Intro	5	I English, III English
Other pedagogical studies: https://www.aalto.fi/en/services/aalto-university-pedagogical-training-for-faculty (totally max 18 ECTS) and Quickstart for University Teaching (no credits)			

Finnish or Swedish language studies (maximum 6 ECTS)

Finnish/Swedish courses (minimum level A1) from Aalto University Language Centre. For example:

LC-7210	Finnish 1	3	
LC-7220	Finnish 2	3	
LC-7230	Finnish 3	3	
LC-7240	Finnish 4	3	
LC-7250	Finnish 5	3	
LC-7260	Finnish 6	3	
LC-7270	Finnish 7	3	
LC-7280	Finnish 8	3	
LC-5771	Swedish 1A	3	
LC-5772	Swedish 1B	3	

* These are independent online courses, to be completed at findocnet.fi in English, Finnish or Swedish. Registration by email to doctoralservices@aalto.fi. More information at aalto.fi.

** These are independent studies, to be agreed with the supervising professor and completed in the agreed timeframe in English, Finnish or Swedish. More information.

Research field studies

Compulsory courses

No compulsory course

Aalto University
School of Electrical
Engineering

Courses suitable for research field studies (examples)

Code	Course name	ECTS	Period, teaching language (supplementary language of instruction)
Doctoral seminars and courses			
ELEC-L8122	Doctoral seminar in Automation, Systems and Control Engineering I D	5	I-summer, English
ELEC-L8123	Doctoral seminar in Automation, Systems and Control Engineering II D	5	I-summer, English
ELEC-L3212	Doctoral Course in Micro and Nanosciences D	10	I-II, English
ELEC-L8745	Doctoral Course in Measurement Science and Technology D	10	III-IV, English
ELEC-L8743	Radar Electronics D	6	I-II, English III-IV English
ELEC-L5634	Research Seminar in Acoustics and Audio Technologies D	1-3	I-V, English
Methodological, theoretical, and content studies (related to the thesis)			
ELEC-L0260	Literature I D**	1-6	any
ELEC-L0261	Literature II D**	1-6	any
ELEC-L0262	Literature III D**	1-6	any
ELEC-L0280	Summer or Winter Schools I D**	1-3	any
ELEC-L0281	Summer or Winter Schools II D**	1-3	any
ELEC-L0282	Summer or Winter Schools III D**	1-3	any
Disseminating research results			
ELEC-L0270	Publishing Research Results I D**	1-3	any
ELEC-L0271	Publishing Research Results II D**	1-3	any
ELEC-L0210	Presenting research at a conference I D**	1	any
ELEC-L0211	Presenting research at a conference II D**	1	any
ELEC-L0212	Presenting research at a conference III D**	1	any

Aalto University
School of Electrical
Engineering

** These are independent studies, to be agreed with the supervising professor and completed in the agreed timeframe in Englsih, Finnish or Swedish. More information.

Doctoral thesis

The doctoral thesis is written on a topic related to the research field that the doctoral student has chosen and that has been approved by the supervising professor and the doctoral programme committee of the School of Electrical Engineering. The approval of the thesis includes a public defence after a pre-examination process. The accepted forms of theses are monographs and article-based doctoral theses.

Intended learning outcomes of the doctoral thesis

After successfully defending their doctoral thesis, the doctoral student will demonstrate the ability to:

- plan, execute, and report on their research and manage their data in accordance with established standards of academic research.
- proficiently search for, critically evaluate, apply and synthesize existing knowledge and to formulate research questions.
- employ scientific research methods to create new scientific knowledge independently.
- make critical assessments required for addressing and resolving complex problems in the realms of research, innovation, and societal challenges.

A doctoral thesis is a public document and is kept for public display at the university. All thesis works are public in Finland (law 621/1999).

Licentiate thesis

The primary target degree for doctoral students at Aalto University is the doctoral degree. However, it is still possible to complete a licentiate degree before or instead of the doctoral degree

The licentiate thesis is written on a topic related to the research field chosen by the doctoral student . The licentiate thesis must have been approved by the supervising professor and the doctoral programme committee of the School of Electrical Engineering. The approval of the thesis includes a presentation of the thesis at the department after an examination process. The accepted forms of licentiate theses are monographs and article-based licentiate theses.

Intended learning outcomes of the licentiate thesis

After successfully completing their licentiate thesis, doctoral students will demonstrate the ability to:

- discuss and present knowledge related to the field of research

- independently and critically apply scientific research methods

A licentiate thesis is a public document and is kept for public display at the university. All thesis works are public in Finland (law 621/1999).

Extracurricular studies

The degree structure of the programme in Sisu also includes a module called “Extracurricular studies”. This module will not be included in the doctoral degree, but it can be used to register for courses which the doctoral student wishes to take in addition to their degree studies.

These can be e.g.
Finnish as a foreign language: https://www.aalto.fi/en/language-and-communication-studies/finnish-as-a-second-language-and-as-a-foreign-language
Language and communication courses for doctoral students: https://www.aalto.fi/en/language-and-communication-studies/language-and-communication-courses-for-doctoral-students
Other language and communication studies: https://www.aalto.fi/en/language-and-communication-studies/teaching
Researcher and working life skills: https://www.aalto.fi/en/doctoral-education/doctoral-courses-and-curriculum#2-researcher-and-transferable-skills-courses