

Electric Machines, Drives and Automation



What is Electric Machines, Drives and Automation (ESA) all about?

Electric Machines, Drives and Automation is a multidisciplinary field that focuses on electric machines, power electronics, control of electrical drives, mechatronics, and industrial automation.

What will you learn?

You will learn everything about:

- electric motors, generators and transformers,
- power electronics,
- control of electric drives using microcontrollers,
- mechatronics system design, vehicle control dynamics,
- electric vehicle drives,
- industrial automation (PLC, SCADA).

In numerous laboratory exercises, you will acquire the practical knowledge needed in the industry and independently solve challenging engineering problems.



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Skills

- Ability to design and manufacture mechatronic systems using 3D printers.
- Experience in design and testing of electric motors, generators and energy converters.
- Automation and commissioning of production plants.
- PLC programming and SCADA system development.
- Microcontroller programming.
- Use of advanced tools to solve electromagnetic problems.
- Use of industrial programs for automation and development of simulation models.
- An engineering approach to problem-solving.
- Presentation of technical solutions.
- Teamwork.

Career

Our engineers work in the field of power systems, automation of industrial processes (gas, oil, pharmaceutical), electromobility, design of industrial plants, and development of their components.

You can work as:

- automation system architect,
- PLC programmer,
- specialist for electric motor drives,
- designer of electrical machines, energy converters,
- development engineer for digital control systems.

Studying Electric Machines, Drives and Automation (ESA)

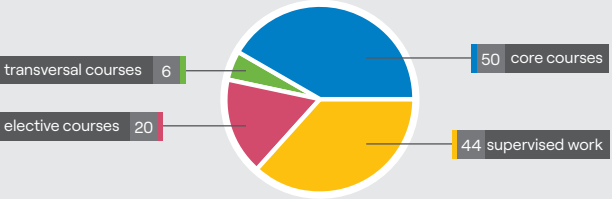
ESA is an excellent jump-start for your career! You will learn about current topics, such as electric vehicles and Industry 4.0. In the laboratories used for industrial testing, you will use state-of-the-art equipment and modern technologies. During your studies, you will go on expert visits to industrial plants and have the possibility to participate in research and development projects.

Our students:

- independently control electric motors and generators,
- learn how energy converters work,
- spend 419.2 hours in the lab,
- post pictures of electric motors on Instagram,
- prove that all electronic devices work on white smoke,
- learn how to design and test an electric machine,
- respect copper, aluminum and iron,
- learn how servo drives work,
- learn the basics of PLC and SCADA system operation,
- design, print, and test their own mechatronic system,
- use 3D printers to make electric vehicles,
- participate in 2 annual picnics,
- get job offers before they finish their studies.

PLAN OF STUDY	SEMESTER	ECTS
Core courses		50
Fundamentals of Power Electronics*	1	5
Automation of Drive Systems	1	5
Synchronous and Induction Machines	1	5
Control techniques in mechatronics	1	5
Seminar 1	1	3
Control of Electric Machines	2	5
Generators and Transformers	2	5
Electronic power converters	2	5
Seminar 2	2	3
Electric Drives	3	5
Industrial Systems	3	5
Control of Electromechanical Systems	3	5
Research seminar	3	5
Project	3	3
Diploma thesis	4	30
Elective courses	1, 2, 3	20
Transversal courses	1, 2, 3	6

* the course is also offered at the undergraduate level (if the course is passed at the undergraduate level, it can be replaced by the Elective course recommended for the profile)




For me, studying ESA will be best remembered for laboratory work and teaching topics directly related to problems from practice. Working in state-of-the-art laboratories allowed me to get acquainted with the challenges that awaited me in the workplace.

Mateo Milovac

Rimac Automobili d.o.o.



During my master study at ESA, I've gained several skills that helped me to start a research carrier at Aalborg University. Methods for solving technical problems, laboratory work experience and knowledge of industrial software are just a few benefits that I would highlight.

Mateja Novak, PhD

Aalborg University



Studying ESA, I gained theoretical and practical knowledge that was an excellent starting point for further career development in the automation of industrial plants. During the studies, ESA provides extensive knowledge required for involvement in the work on the most complex control systems.

Edvin Šafranko

Montelektro d.o.o.