

- Master of Science in Sustainable Energy Engineering
- 2 years, full-time, 120 ECTS credits
- Faculty of Engineering
- Lund Campus
- Application deadline: January 2023
- Programme start: August 2023

PROGRAMME OVERVIEW

The landscape of the energy industry is drastically changing throughout the world due to concern over global warming, push for using non fossil energy sources, geo-political problems connected to the fossil fuel sources and an increased electrification of transport and industry. Strict regulations over the emissions from energy industry and new roadmaps for a fossil fuel free future are in place in many countries. Worldwide, companies, universities and research institutes are exploring new technologies and improving existing technologies to meet new demands and regulations.

The programme relates mainly to energy conversion and energy distribution, which concerns technical equipment such as power plants, fuel cells, engines, batteries or heat pumps and are usually based on the more basic sciences thermo- and fluid dynamics, but also other parts of physics as well as parts of chemistry. The programme is a cooperation between the Departments of Energy Sciences, Architecture and the Built Environment, Biomedical Engineering and Technology and Society at LTH – the faculty of Engineering at Lund University. The research at the participating departments are multifaceted and the goals range from increased electrical efficiency and reduced environmental impact to more efficient energy supply in sustainable urban construction. This expertise should now be implemented in the education of future students to fill the gap between the graduate's knowledge and a fast-developing energy industry. The Master's programme is aimed to address this gap.

Students have some freedom to choose courses fitting the personal interest and can choose between four tracks, i.e., automotive, computational, electric power systems and space heating and cooling. The programme features both theoretical and practical learning, as well as group assignments and presentations. In addition to courses, all of our students undertake a research project for their Master's thesis. The project can be done either in cooperation with industry or be of more academic nature and can be carried out either locally or abroad.

PROGRAMME MODULES/COURSES

Semester 1-2, mandatory courses: Energy Engineering (7.5 credits), Environmental Issues (7.5 credits), Energy Converters

for Sustainable Transport (7.5 credits), Environmentally Friendly Power Generation (7.5 credits), Turbomachinery (7.5 credits), Photovoltaic Systems (7.5 credits).

Semester 2, mandatory elective courses (choose 2 out of 4): Numerical Fluid Dynamics and Heat Transfer (7.5 credits), Steam and Gas Turbines for Renewable Power Production – with Aero-engines (7.5 credits), Hydrogen, Batteries and Fuel Cells (7.5 credits), Wind Power Technology (7.5 credits).

Semester 3, mandatory courses: Advanced Sustainable Energy Engineering (7.5 credits), Biomass Conversion; Boilers, Gasifiers and Clean Combustion (7.5 credits).

Semester 4: mandatory degree project (30 credits)

Five elective tracks (15 credits) are available (semester 3):

The automotive track provides in depth knowledge on power-train technology for land and sea transportation. The courses in this track further develop knowledge from the mandatory and elective mandatory courses.

- The computational track provides methods applicable to many energy engineering problems.
- The thermal power track provides methods applicable to advance thermal cycle design.
- Electric power systems i.e., at the intersection between classical mechanical and electric engineering. This track provides the broad understanding of both production and distribution of electricity, addressing the difficulties of introducing renewable electricity sources, into the grid.
- The space heating and cooling track deals with energy requirements and technologies for a good indoor climate, primarily using energy that would otherwise not be used.

The degree project (thesis) can be done either in cooperation with industry or be of more academic nature and can be carried out either locally or abroad.

CAREER PROSPECTS

Currently, there are very big changes in the world's energy supply. The programme aims to develop future energy technology professionals by providing them with deep theoretical knowledge in combination with hands-on practical experience. The programme will prepare students and develop the necessary professional knowledge for a career in energy companies, authorities, consulting firms or academia.

The energy industry is large. For example, more than half of the world's 20 largest companies (in revenue) are oil or energy companies. Planned investments in infrastructure (transformation and transfer) are huge. The consequences for the labour market should be that the demand for people educated in



energy technology will continue to increase. The programme is concluded with a Master's thesis project that may be performed in close collaboration with either industry in Sweden or abroad or with the world-leading academic research that is carried out at Lund University.

ENTRY REQUIREMENTS AND HOW TO APPLY

Entry requirements

A Bachelor's degree in mechanical engineering, chemical engineering, civil engineering, environmental engineering or equivalent. Completed courses in mathematics including calculus, multivariable analysis and linear algebra, as well as completed courses in classical thermodynamics, heat transfer (may be included in a comprehensive course in thermodynamics) and fluid mechanics. A course in electrical engineering, including circuit theory, three-phase AC and electrical machines. English Level 6.

How to apply

- 1. Apply online:** Go to www.lunduniversity.lu.se/sustainable-energy. Click on "Apply" and follow the instructions for the online application at www.universityadmissions.se, the Swedish national application website. Rank the chosen programmes in order of preference.
- 2. Submit your supporting documents:**
 - **General supporting documents:** Check what documents you need to submit (i.e. official transcripts, degree diploma/proof of expected graduation, translations, proof of English, passport) and how you need to submit them at www.universityadmissions.se.
 - **Programme-specific supporting documents:** For information on programme-specific documentation, please check the programme webpage.

3. Pay the application fee (when applicable)

Tuition fees

Tuition fee SEK 155 000 per year for non-EU/EEA citizens. No fee for EU/EEA citizens. See www.lunduniversity.lu.se for details on tuition fees.

Selection criteria/additional information

The selection is based on academic qualifications and on a statement of purpose.

ABOUT THE FACULTY OF ENGINEERING

The Faculty of Engineering LTH, is a place for dreams and discoveries. We inspire creative development of technology, architecture and design and teach some of Sweden's most attractive Master's programmes, all built on a broad research base. LTH is among the leading engineering faculties in Europe with nearly 10 000 students. Over 1 000 researchers at LTH work hard to improve the quality of life for people and promote more careful use of the Earth's resources. A world record in 5G technology, solar cell-driven water purification, early cancer diagnosis, nanotechnology for more efficient solar panels, and a health-promoting oat drink are some of the innovations developed at LTH. Together we explore and create – for the benefit of the world.

ABOUT LUND UNIVERSITY

Lund University was founded in 1666 and is repeatedly ranked among the world's top 100 universities. The University has around 46 000 students and more than 8 000 staff based in Lund, Helsingborg and Malmö. We are united in our efforts to understand, explain and improve our world and the human condition

CONTACT

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