NOVIA
UNIVERSITY OF APPLIED SCIENCES

Become skilled in the control and optimization of energy systems, explore new innovations in the bio-based circular economy and discover the latest developments in energy generation and storage. Welcome to Novia University of Applied Sciences, in the biggest energy industry cluster in the Nordic countries!

ENERGY TECHNOLOGY

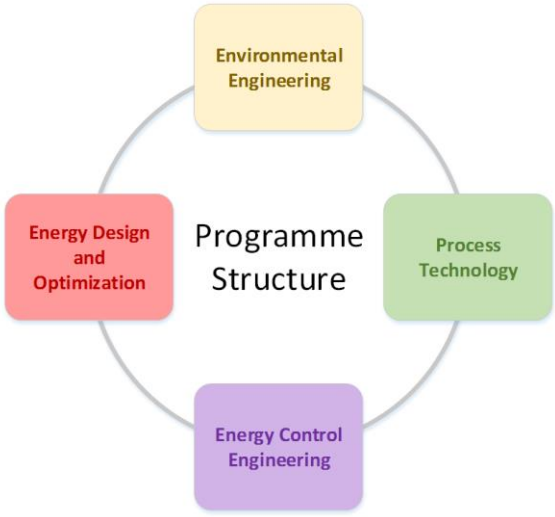
2021-2022

At Novia University of Applied Sciences, we firmly believe that through the smart management and control of our energy consumption and distribution networks, many of the future challenges of energy sustainability and transition are attainable.

Achieving this requires a curious, courageous and innovative problem-solving skill-set. Our programme aims to nurture those future professionals, with the traditional training in engineering in technology and natural sciences, supplemented with the inclusion of societal and other multidisciplinary perspectives. These form the key holistic competencies essential for future-proofing a career in engineering.

Content: 60 ECTS
Teaching language: English
Duration: 2 semesters

The program is intended for students typically from environmental, energy, mechanical, electrical or civil engineering disciplines



For more information, please contact:

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http://vaasaregion.fi/ http://energyvaasa.vaasanseutu.fi/

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CURRICULUM (Preliminary, changes can occur)

Autumn	ECTS	Spring	ECTS
EE Sustainability in Engineering Solutions	6	EE Bio-Economy Innovation	3
PT Energy Technology	3	DO Technology: Solutions, Design and Engineering	3
PT Combustion Engineering	6	DO Distributed Energy Systems	6
PT Energy: Resources, Transfer and Storage	6	DO Modelling, Simulations and Optimization	6
EC System Control Methods	9	EE Project Management	6
EC Fundamentals of Electrical Energy	3	EC Energy Control with AC drives	3

Environmental Engineering (15 ECTS) - Module: EE

- Definition and measurement of sustainability in an energy context
- Waste management and recycling technologies - environmental legislation and administration
- Life Cycle Analysis modelling using cradle to cradle/grave scenarios and assessment
- Bio-refining of agricultural residuals and the production of bioplastics/biocomposites
- Behavioral economics - Nudge psychology and the Technology Adoption Curve
- Project risk and environmental impact management

Process Technology (15 ECTS) - Module: PT

- Process design basics: Energy sources, resources, thermodynamics, combustion engineering
- Combustion modelling and simulations - theory and practical measurements
- Resource efficiency and the analysis of energy systems from a global perspective
- Current/ future prospects for energy storage (mechanical, chemical, thermal) technologies
- Low(er) carbon technologies: controversy with nuclear power and co-firing solutions
- Energy prospecting and assessment for solar and wind resource potential
- Emission control and the use of liquid/non-liquid biofuels transport solutions

Energy Design and Optimization (15 ECTS) - Module: DO

- Principles of design and engineering of distributed energy concepts and technologies
- Basics in optimization theory with practical examples with focus on energy systems and challenges
- Modelling theory and the use of 'simulation' as a tool in energy systems design
- Analyzing, designing, developing solutions for distributed energy in an 'energy village' concept
- Smart grid systems including distributed consumption and electricity production
- Energy solution development with emphasis on reliability, dispatchability and economics

Energy Control Engineering (15 ECTS) - Module: EC

- Introduction to Number systems, Boolean Logic and Gates Circuits
- Authentic PLC Control with a practical application programming project
- Microcontroller techniques and System Control with Interrupt Requests
- Principle of Feedback Control Systems and the Proportional, Integral and Derivative components (PID)
- Electrical Energy Fundamentals and Energy Control with AC drives

The Vaasa region boasts the largest energy cluster - EnergyVaasa - in the Nordic region. The cluster encompasses more than 140 companies which employ over 11, 000 people and 80% of production is exported. This represents 30% of Finland's total exports in the energy industry and is 12% of the country's total technology exports. Many of the companies are global market leaders in the production and distribution of energy.

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