

Advanced Energy Solutions Minor

Basic information

Code: ENG3076

Extent: 20-25 ECTS

Language: English

Teacher in charge: Mika Järvinen

Target group: All master's level students at Aalto University

Application process: No

Quotas and restrictions: No

Prerequisites: In preparing their study plan, the students are required to check that they fulfil the prerequisites for each course i.e. to take the courses in the right order.

Content and structure of the minor

Description

The Advanced Energy Solutions Minor offers students good overall knowledge within the field of energy systems, as well as further specialization opportunities in four subject areas: Industrial Energy Processes, Energy Conversion, Energy in Buildings and Energy Systems & Markets. The minor covers most common energy conversion technologies and issues related to the improvement of energy efficiency on an industrial and societal level.

Learning outcomes:

- Understand the fundamentals of energy systems
- Be able to take a holistic view to understand dependencies across large energy systems
- Analyze and evaluate existing and future challenges in the field of energy, and the role of energy technologies and processes in addressing these challenges.

Code	Name	Credits
Compulsory course (5 cr)		
AAE-E1000	Introduction to Advanced Energy Solutions	5
Select one course (5 cr)		
EEN-E1030	Thermodynamics in Energy Technology	5
ELEC-E8422	An Introduction to Electric Energy	5
CHEM-E7100	Engineering Thermodynamics, Separation Processes, part I	5
Optional courses (10-15 cr), courses can be selected under one or several topics:		
Energy Conversion		
AAE-E2005	Thermochemical Energy Conversion L	5
AAE-E3100	Energy Carriers L	5
EEN-E3002	Power Process Simulation	5

AAE-E3090	Renewable Energy Engineering	5
EEN-E1020	Heat Transfer	5
EEN-E1010	Power Plants and Processes	5
AAE-E3030	Numerical Modeling of Multiphase Flows L	5
AAE-E3070	Electrical Energy Storage Systems L	5
AAE-E3080	Thermal Energy Storage Systems L	5
EEN-E2001	Computational Fluid Dynamics L	5
Industrial processes		
CHEM-E7190	Process Dynamics and Control P	5
CHEM-E7160	Fluid Flow in Process Units	5
AAE-E3120	Circular Economy for Energy Storage L	5
EEN-E3001	Fundamentals of Industrial Energy Engineering	5
CHEM-E1120	Thermochemical Processes	5
Sustainable Energy Systems and Markets		
ELEC-E8422	An Introduction to Electric Energy	5
ELEC-E8406	Electricity Distribution and Markets	5
EEN-E3006	Energy Markets	5
EEN-E3004	District Heating and Cooling	5
Sustainable Energy in Buildings and Built Environment		
EEN-E4001	Comfortable and Healthy Indoor Environments	5
EEN-E4002	Heating and Cooling Systems	5
EEN-E4003	Ventilation and Air Conditioning Systems	5
ELEC-E8124	Intelligent Buildings	5
CIV-E3030	Indoor Air Quality	5
CIV-E3040	Indoor Environment Technology	5
EEN-E1040	Measurement and Control of Energy Systems	5
ELEC-E8700	Principles and Fundamentals of Lighting	5
CIV-E3010	Applied Building Physics and Design	5