

Multi-Disciplinary Energy Studies

Basic information of the minor

Code: SCI3038

Extent: 20-25 cr

Language: English

Professor in charge: Peter Lund

Target group: The MES minor is offered to all Aalto University master's students interested in modern energy issues, in particular from the School of Science. International students are welcomed.

Application procedure: See detailed information at the end of the description.

Quotas and restrictions: No quotas. The minor is targeted only for master students.

Prerequisites: No prerequisites.

Content and structure of the minor

Goal

The goal of Aalto's Multi-Disciplinary Energy Studies minor is to educate multi-skilled students with both subject-specific know-how and integrative understanding across a range of energy issues.

Scope

Energy is one of mankind's grand challenges linked to climate change, human development, sustainability, economy, and innovations, among others. Understanding energy and its different facets requires strong systemic thinking and multiple skills.

The Multi-Disciplinary Energy Studies (MES) is an elective minor for Aalto University master's students interested in energy and society. It is run by the Aalto University School of Science's Energy Initiative (<http://energyscience.aalto.fi/en/>) on Otaniemi Campus in Espoo, in collaboration with other Aalto schools. MES offers a multidimensional view on energy, to understand the complexity of energy in new ways. It combines key subjects in science and engineering, economics and business, social sciences and human behaviour. Offering an integrative approach to create solutions in energy, MES is open to students of different disciplines.

The MES minor deals with topical energy themes such as sustainable energy, energy frugality, green-ICT, energy markets, carbon markets, green business, green innovations, human behaviour and energy, smart power, E-mobility, among others.

Collaboration

The Multi-Disciplinary Energy Studies (MES) is a collaborative teaching effort between several disciplines of Aalto University, as follows: system analysis (Prof. Ahti Salo, Prof. Afzal Siddiqui), media (Prof. Ramia Maze), energy sciences (Prof. Peter Lund), information technology (Prof. Antti Ylä-Jääski, Prof. Keijo Heljanko), business (Profs. Karlos Artto, Jan Holmström), economics (Prof. Matti Liski).

Structure

The Multi-Disciplinary Energy covers key perspectives on energy issues: science and technology, economics and business, social sciences and human behaviour. All students familiarize themselves with each of these three core domains.

The MES minor has a 2-level structure, as follows:

Level 1

- Introduction to energy, multi-disciplinary issues, approaches, cases and tools
- **All students will participate in the multi-disciplinary energy introduction course**

Level 2

- Introduction to energy & society, trends, transitions, sustainability; energy efficiency
- Deepening understanding of economics and business, social sciences and/or human behaviour while applying these to sustainable energy
- **Students need to cover at least two out of the three perspectives above**

Due to the multi-disciplinary character, students are encouraged to discuss the detailed contents of courses to be included in the MES minor with the professors in charge.

The extent of the MES minor is 20-25 credits. The MES minor contents are the following:

Code	Name	Credits	Period
------	------	---------	--------

Level 1 Core course (5 cr) :

Compulsory course to all students; input from several disciplines jointly. Each collaborator provides a 2-4 h introductory lecture to energy from their own perspective

PHYS-C1380	Multi-disciplinary energy perspectives	5	III-IV
----------------------------	--	---	--------

Level 2 Supportive courses (15-20 cr):

Students will choose one of the two following energy specific courses:

CS-E4002	Special Course in Computer Science	1-10	
--------------------------	------------------------------------	------	--

PHYS-C6370	Fundamentals of New Energy Sources	5	I-II
----------------------------	------------------------------------	---	------

Students will choose courses from the list below: 5-10 credits per perspective (S&T, economics & business, social & behavior), with some energy relevant dimension, in total 10-15 cr.

CS-E4002	Special Course in Computer Science	1-10	
--------------------------	------------------------------------	------	--

CS-E4100	Mobile Cloud Computing	5	I-II
--------------------------	------------------------	---	------

MS-E2117	Riskianalyysi/Risk Analysis	5	III-IV
--------------------------	-----------------------------	---	--------

MS-E2136	Special Topics in Decision Making	3-6	
--------------------------	-----------------------------------	-----	--

PHYS-C6370	Fundamentals of New Energy Sources	5	I-II
----------------------------	------------------------------------	---	------

PHYS-E0483	Advances in New Energy Technologies	5	III-IV
----------------------------	-------------------------------------	---	--------

PHYS-E0544	Individual Studies in Physics	1-10	I, II, III, IV, V
----------------------------	-------------------------------	------	-------------------

TU-E2030	Advanced Project-based Management	3-5	I-II
--------------------------	-----------------------------------	-----	------

TU-E2011	Industrial Service Operations	3-6	I
--------------------------	-------------------------------	-----	---

31C01300	Energy and Environmental Economics	6	V (The course has only limited number of places for students of the minor.)
--------------------------	------------------------------------	---	---

31E01800	Resource and Environmental Economics	6	Not lectured 17-18. (The course has only limited number of places for students of the minor.)
--------------------------	--------------------------------------	---	---

DOM-E5103	Topics in Visualization and Cultural Analytics	3-6	III (The course has only limited number of places for students of the minor.)
---------------------------	--	-----	---

If you want to replace a Level 2 course with your own choice, please contact Prof. Peter Lund.

Applying to the Multi-Disciplinary Energy Studies minor

You can apply for the master's level Multi-Disciplinary Energy Studies minor at any time. The applications are dealt with at the end of each month.

Instructions on how to apply:

- Send your contact information, approved personal study plan (HOPS) including Multi-Disciplinary Energy Studies, transcript of records and motivation letter via email to johanna.bovellan@aalto.fi.
- Include the list of courses which you intend to include in the Multi-Disciplinary Energy Studies, selected from the list above.

Please note the following:

- Aalto students from other schools than the one organising a given course, need to apply to the courses of the School of Business (31C01300 and 31E01800) and those the School of Arts, Design and Architecture (DOM-E5103), while they may freely choose courses offered by their own school. Please see instructions on how to apply to courses: [Instructions for applying](#)
- Other courses are open for Aalto University's students to register via WebOodi.
- Students should include courses of at least two out of the three perspectives of the MES minor.

Registered Multi-Disciplinary Energy Studies students are given preference in admission to the BIZ and ARTS courses. However, minor does not guarantee that students are admitted to all courses that are part of their study plan. Students also need to register to each individual course separately in WebOodi. Different courses have different application procedures and deadlines so read the course web pages carefully.

Please contact the planning officer or study secretary of your degree programme to make sure that they approve including Multi-Disciplinary Energy Studies minor in your study plan and your degree. Each student is personally responsible for obtaining this approval.

