# Course: Energy Technologies and Systems for the Sustainable Society — credits: 5

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| **Course code** | ESVM19ETS |
| **Name** | Energy Technologies and Systems for the Sustainable Society |
| **Study year** | 2025-2026 |
| **ECTS credits** | 5 |
| **Language** | English |
| **Coordinator** | N.C. Adema |
| **Modes of delivery** | Education |
| **Assessments** | Assignment - Other assessment |

**Learning outcomes**

After successfully finishing this module, the student:

a. understands basic physical laws, expressions and units concerning energy topics (*e.g.* MJ, Mtoe, m, kWh, GW), and is able to make simple calculations using different units
b. has basic knowledge of the characteristics (both technological, economic and environmental) of renewable energy technologies
c. can describe the basic technical features of current energy infrastructure (power and gas) on local, regional, national and European scale, and how networks at different scales are connected
d. can reflect on the challenges in the energy structure if renewable energy systems are added to it (*e.g.* wind energy)
e. is familiar with the main characteristics of energy demand, including the scale, costs and future developments
f. has basic knowledge and systemic vision of the technical issues related to the planning and operation of energy systems (power and gas), including renewable energy sources
g. understands the importance of balancing demand and supply
h. has sound knowledge on developments in sustainable energy technologies and systems (*e.g.* energy storage and mutual integration of energy systems) and is able to anticipate on these developments

**Content**

In this module, the student will acquire qualitative and quantitative knowledge of physical aspects related to energy. After that the fundamentals of fossil and renewable energy technologies are discussed, providing insight into existing and emerging energy technologies that can contribute to energy transition in a significant and sustainable way. The student will develop basic knowledge and systemic vision of the technical and economic issues related to the planning and operation of energy systems with renewable energy sources, and the relationship between energy technology development and the requirements of end users.

**Included in programme(s)**

Energy for Society

**School(s)**

Institute of Engineering

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