HÖGSKOLAN I GÄVLE

# Energy Systems 6cr

*Energisystem 6hp*

Set by Faculty of Engineering and Sustainable Development

| **Version** | **Set at** | **Valid from** |
|---|---|---|
| | 10/15/14 | **HT2015** |

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| **Level** | A1N |
| **Education level** | Second cycle |
| **Course identifier** | ETA000 |
| **Credits** | 6cr |
| **Main field of study** | Energy Systems |
| **Subject group** | Energy Technology |
| **Disciplinary domain** | Technology 100.0% |

**Learning outcomes**

After completion of the course the student shall be able to
Knowledge and understanding
1. present important concepts and definitions in energy systems
2. present different types of energy systems such as industrial energy systems, building energy systems, and transport from a sustainability point of view
3. present and demonstrate understanding of current research and development work related to the course content
4. present the design of power-heating systems

Competence and skills
5. assess and analyse the system limits of different energy systems
6. assess and analyse building energy systems and industrial energy systems
7. assess different energy systems with respect to climate and environmental considerations
8. define and formulate a project work autonomously as well as plan and, using appropriate methods, undertake the same within predetermined time frames
9. in speech and writing report clearly their project work and discuss their conclusions and the knowledge and arguments on which they are based

Judgement and approach

10. demonstrate awareness of ethical aspects of research and development work
11. make assessments informed by social issues related to the course content.

**Course content**

Introduction to energy systems
Energy systems definitions
Energy systems in the world and Sweden
Energy use and energy supply
Combined heat and power (CHP) and district heating plants
District heating and cooling
Instruments in the energy system area
Industrial energy systems
Building energy systems
Transports: energy, resources, and environment

**Teaching**

Lectures, seminars, project work, and field trips

**Prerequisites**

Completion of Bachelor's degree in technology or natural sciences of at least 180 credits, or equivalent foreign degree, at least 12 credits of which in thermodynamics and fluid mechanics, or equivalent knowledge.

**Examination**

Written examination and project work

**Grade**

A, B, C, D, E, Fx, F

**Other regulations**

Criteria for final grades are announced by the co-ordinator or examiner at the start of the course.

**Sustainable environment**

The majority of the course content deals with sustainable development..

**Module**

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| 0010 | Skriftlig tentamen | 4cr | Grade: AF |
| 0020 | Project | 2cr | Grade: UG |