



# HÖGSKOLAN I GÄVLE

## Industrial Energy Systems 6 cr

*Industriella energisystem 6 hp*

Set by Faculty of Engineering and Sustainable Development

**Version**

**Set at**

**Valid from**

5/9/22

**HT2023**

<b>Level</b>	A1F
<b>Education level</b>	Second cycle
<b>Course identifier</b>	ETA327
<b>Credits</b>	6 cr
<b>Main field of study</b>	Energy Systems
<b>Subject group</b>	Energy Technology
<b>Disciplinary domain</b>	Technology 100.0 %

**Learning outcomes** After completion of the course the student shall be able to

Knowledge and understanding

1. describe the structure and development of energy use
2. present audit methodologies and energy management measures
3. describe the system implications of energy management and supply measures

Competence and skills

4. use and develop methods for energy system analysis
5. undertake an industrial energy audit and analyse energy use for both support and production processes
6. plan and give a written account of work in project form and discuss conclusions, knowledge and the arguments on which they are based on

Judgement and approach

7. make assessments informed by disciplinary issues related to the course content
8. evaluate ethical aspects of research and development work.

**Course content** Industrial energy use and its structure, development, and environmental implications

Industrial energy use in Sweden and in the world  
 Industry and the deregulated energy markets  
 Correlation between industrial production and energy use  
 Energy audit and forecasting  
 Energy use in various production processes and support processes  
 Production planning, load management, energy storage, and energy efficiency  
 Energy management, driving forces, and obstacles for energy measures  
 Systems analysis and modelling  
 Use of optimization tools for industrial energy systems

**Teaching**

Lectures, projects, seminars, and computer laborations

**Prerequisites**

Building Energy Systems 7,5 credits and Energy Systems 7,5 credits, or equivalent

**Examination**

Written examination, project work, seminars and laboratory work

0010 Written examination 3 credits examines Learning outcomes 1-3, grades A-F  
 0020 Project work and seminars 1.5 credits examines Learning outcomes 5-8, grades Pass, Fail  
 0030 Laboratory work 1.5 credits examines Learning outcomes 4-5, grades Pass, Fail

**Grade**

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

**Other regulations**

Degree criteria for final grade will be handed out by the course responsible or examiner latest at the beginning of the course.

**Sustainable environment**

A minor part of the course content deals with sustainable development.

**Module**

0010	Written examination	3 cr	Grade: AF
0020	Project work and seminars	1.5 cr	Grade: UG
0030	Laboratory work	1.5 cr	Grade: UG