



# HÖGSKOLAN I GÄVLE

## Industrial Energy Systems 6cr

*Industriella energisystem 6hp*

Set by Faculty of Engineering and Sustainable Development

### Version

<b>Set at</b>	<b>Valid from</b>
10/15/14	<b>HT2015</b>

<b>Level</b>	A1F
<b>Education level</b>	Second cycle
<b>Course identifier</b>	ETA320
<b>Credits</b>	6cr
<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. present methods for energy system analysis
4. describe the system implications of energy management and supply measures

Competence and skills

5. use tools for optimising industrial energy systems
6. undertake an industrial energy audit and analyse energy use for both support and production processes
7. plan and, using appropriate methods, undertake a project within predetermined time frames
8. in speech and writing report their project work and discuss their conclusions and the knowledge and arguments on which they are based

Judgement and approach

9. make assessments informed by disciplinary issues related to the course content
10. demonstrate awareness of 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  
Industrial economics and energy use  
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  
Optimisation tools, for example Pro\_pi and reMIND used for industrial energy efficiency  
Industrial project

**Teaching** Lectures, projects, lessons, seminars, and computer labs.

**Prerequisites** Energy resources 6 credits, Sustainable cities 6 credits, and Building Energy systems 6 credits, or equivalent.

**Examination** Written examination, project work, and laboratory 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**

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