



## HÖGSKOLAN I GÄVLE

### Energy Systems Optimisation and Simulation 6 cr

*Optimering och simulering av energisystem 6 hp*

Set by Faculty of Engineering and Sustainable Development

**Version**

**Set at**

**Valid from**

10/15/14

**HT2015**

<b>Level</b>	A1F
<b>Education level</b>	Second cycle
<b>Course identifier</b>	ETA321
<b>Credits</b>	6 cr
<b>Main field of study</b>	Energy Technology
<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. present methods for energy system analysis
2. present the principles of the programs that are provided in the exercises
3. describe the system implications of energy management measures
4. describe the system implications of supply measures

Competence and skills

5. use simulation and optimisation tools for the analysis of energy systems
6. find limitations and prerequisites when the program is used
7. assess and analyse the results from the program and perform sensitivity analyses
8. plan and, using appropriate methods, undertake a project within predetermined time frames
9. in writing report 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 disciplinary issues related to the course content
12. make assessments informed by social issues related to the course content

<b>Course content</b>	By means of optimisation and simulation programs, the design and possible changes of energy systems in the areas of buildings, industries, and municipal/regional energy systems are studied and analysed in respect of:		
	Energy supply Energy use Energy efficiency New investment Load management Change of energy carriers		
<b>Teaching</b>	Lectures and project work/computer labs		
<b>Prerequisites</b>	Energy Resources 6 credits, Sustainable Cities 6 credits, and Building Energy Systems 6 credits, or equivalent.		
<b>Examination</b>	Project work		
<b>Grade</b>	A, B, C, D, E, Fx, F		
<b>Other regulations</b>	Criteria for final grades are announced by the co-ordinator or examiner at the start of the course.		
<b>Sustainable environment</b>	The majority of the course content deals with sustainable development..		
<b>Module</b>			
	0010 Building Simulation, project	2 cr	Grade: AF
	0020 Optimisation of industrial energy systems, project	2 cr	Grade: AF
	0030 Optimisation of municipal and regional energy systems, proj.	2 cr	Grade: AF