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**
	5/9/22	**HT2023**

Level	A1F
Education level	Second cycle
Course identifier	ETA326
Credits	6 cr
Main field of study	Energy Technology
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 methods for energy system analysis
2. explain the principles for different simulation and optimization software
3. describe the system implications of energy management measures and supply measures

Competence and skills
4. use simulation and optimisation tools for the analysis of energy systems
5. assess and analyse the results from the program and perform sensitivity analyses
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. demonstrate awareness of ethical aspects of research and development work
8. make assessments informed by social and disciplinary issues

Course content

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

Use of various simulation and optimization tools for analysis of energy systems such as IDA ICE, ReMind and Modest

Teaching Lectures and assignments

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

Examination Assignments

0010 Assignment - Building simulation 2 credits examines Learning outcomes 1-8, grades Fail, Pass, Pass with Distinction
0020 Assignment - Optimisation of industrial energy systems 2 credits examines Learning outcomes 1-8, grades Fail, Pass, Pass with Distinction
0030 Assignment - Optimisation of municipal and regional energy systems 2 credits examines Learning outcomes 1-8, grades Fail, Pass, Pass with Distinction

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 Assignment - Building simulation	2 cr	Grade: UV
0020 Assignment - Optimisation of industrial energy systems	2 cr	Grade: UV
0030 Assignment - Optimisation of municipal and regional energy systems	2 cr	Grade: UV