



# HÖGSKOLAN I GÄVLE

## Heat and Power Generation 6 cr

Värme- och kraftproduktionssystem 6 hp

Set by Faculty of Engineering and Sustainable Development

### Version

Set at

Valid from

10/15/14

HT2015

<b>Level</b>	A1N
<b>Education level</b>	Second cycle
<b>Course identifier</b>	ETA001
<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 and explain the principles of various conventional heat and power generation systems
2. present the main components of a power plant
3. describe and explain heat pumps and refrigeration machinery and their components
4. present the possibilities and limitations of heat and power generation systems, in particular with regard to sustainable environment

Competence and skills

5. analyse conventional methods for heat and power generation from a systems perspective
6. compare different power generation alternatives and select the most appropriate for given conditions
7. optimise heat and power generation from a thermodynamic perspective
8. plan and, using appropriate methods, undertake a project within predetermined time frames
9. in writing report and discuss their conclusions and the knowledge and arguments on which they are based

Judgement and approach  
10. make assessments informed by disciplinary issues related to the course content  
11. make assessments informed by social issues related to the course content.

**Course content**

Lean production systems  
Fundamental steam power principles  
Advanced steam power cycles  
Combined heat and power generation  
Boilers and combustion  
Basic gas turbine cycles  
Advanced gas turbine systems  
Combined cycles  
Combustion  
Compressor driven refrigeration and heat pump systems  
Absorption cooling systems  
Nuclear power plants  
Project work

**Teaching**

Lectures, project work, and lessons

**Prerequisites**

English language proficiency equivalent to (the Swedish upper secondary school) English course 6/B.  
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**

0010	Written examination	5 cr	Grade: AF
0020	Project Work	1 cr	Grade: UG