



## HÖGSKOLAN I GÄVLE

### Fundamental Thermodynamics 7.5 cr

Grundläggande termodynamik 7,5 hp

Set by Faculty of Engineering and Sustainable Development

**Version**

**Set at**

**Valid from**

12/15/21

**HT2022**

<b>Level</b>	G1F
<b>Education level</b>	First cycle
<b>Course identifier</b>	ETG308
<b>Credits</b>	7.5 cr
<b>Main field of study</b>	Energy Systems
<b>Subject group</b>	Energy Technology
<b>Disciplinary domain</b>	Technology 80.0 % Natural sciences 20.0 %

**Learning outcomes** After completing the course, the student should be able to

Knowledge and understanding

1. explain basic concepts in thermodynamics
2. describe energy and mass balances for simple thermodynamic processes

Competence and Skills

3. perform energy and mass balances and discuss the consequences of these from a system and environmental perspective
4. perform engineering calculations for simple thermodynamic processes
5. perform experiments and present the results both orally and in writing
6. evaluate simple thermodynamic systems with regard to dimensioning and efficiency
7. demonstrate the ability to give a written account of the group's laboratory report and discuss problems and solutions in dialogue with the other groups.

**Course content** Energy and the first law. Thermodynamic system properties. Enthalpy and heat capacity. Gas laws. Energy and mass balances. Entropy and the second law. Temperature scales. Basic thermodynamic processes. The Carnot cycle. Efficiency. Air/water mixtures. Practical

	applications.		
<b>Teaching</b>	Lectures, exercises and laboratory work		
<b>Prerequisites</b>	Algebra and Geometry 7,5 credits, Linear Algebra 7,5 credits and Fundamentals in Fluid Mechanics 7.5 credits or equivalent		
<b>Examination</b>	Written exam, project and assignment 0010 Written exam 6.0 credits examines learning objectives 1-4, 6, grades A-F 0020 Laborations 1.5 credits examines learning objectives 5-7, grades Fail, Pass		
<b>Grade</b>	A, B, C, D, E, Fx, F		
<b>Other regulations</b>	Grading criteria are provided by the course coordinator or examiner in connection with the course introduction.		
<b>Sustainable environment</b>	A minor part of the course content deals with sustainable development.		
<b>Module</b>			
	0010 Written examination	6 cr	Grade: AF
	0020 Laborations	1.5 cr	Grade: UG