



COURSE SYLLABUS

Thermodynamics and Energy Technology, 7.5 credits

Termodynamik och energiteknik, 7,5 högskolepoäng

Course Code: TTYK19	Education Cycle: First-cycle level
Confirmed by: Dean Jun 1, 2019	Disciplinary domain: Technology
Valid From: Aug 1, 2019	Subject group: MT1
Version: 1	Specialised in: GIF
	Main field of study: Mechanical Engineering

Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- show familiarity with basic terms and concepts in thermodynamics
- show familiarity with transport phenomena in the material (Heat conduction, diffusion and viscosity)
- show familiarity with thermodynamics and transport phenomena which are required in the advanced courses within the product and manufacturing processes

Skills and abilities

- demonstrate skills of thermodynamic calculation
- demonstrate the ability to explain the phenomena in the manufacturing processes and the daily phenomena with the knowledge in thermodynamics and transport phenomena

Judgement and approach

- demonstrate the ability to calculate the criteria for the equilibrium of reactions
- demonstrate the ability to calculate the energy (heat) transfer calculation.

Contents

The course deals with basic theoretical knowledge in thermodynamics, application of thermodynamics and energy technology (transport phenomena).

The course includes the following elements:

- Basic and advanced thermodynamics.
- Transport phenomena (Heat transport, mass transport and momentum transport).
- Some examples (applications) of thermodynamics and transport phenomena.

Type of instruction

Lectures.

The teaching is conducted in English.

Prerequisites

General entry requirements and completed courses Mechanics and Strength of Materials 1, 7,5 credits, Linear Algebra (Msc), 7,5 credits, Single Variable Calculus (Msc), 7,5 credits and Multivariable Calculus, 7,5 hp (or the equivalent).

Examination and grades

The course is graded 5,4,3 or Fail.

The final grade for the course is based upon Examination A and Examination B. The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Examination A	3 credits	5/4/3/U
Examination B	4.5 credits	5/4/3/U

Course literature

The literature list for the course will be provided one month before the course starts.

No mandatory text books.

Following books are recommended as references.

- T. Matsushita and K. Mukai, Chemical Thermodynamics in Materials Science – From Basics to Practical Applications –, Springer, 2018.
- O. Beckman, G. Grimvall, B. Kjällerström och T. Sundström, Energilära, Liber, 2005.