



## COURSE SYLLABUS

# Basic Thermodynamics and Transport Phenomena, 3 credits

*Grundläggande termodynamik och transportfenomen, 3 högskolepoäng*

---

<b>Course Code:</b> TGTK19	<b>Education Cycle:</b> First-cycle level
<b>Confirmed by:</b> Dean Dec 1, 2018	<b>Disciplinary domain:</b> Technology
<b>Revised by:</b> Director of Education Oct 27, 2021	<b>Subject group:</b> MT1
<b>Valid From:</b> Jan 1, 2022	<b>Specialised in:</b> GIF
<b>Version:</b> 2	<b>Main field of study:</b> Mechanical Engineering

---

### Intended Learning Outcomes (ILO)

After completion of the course the student should:

Knowledge and understanding

- display knowledge of basic terms and concepts in thermodynamics
- display knowledge of thermodynamic laws
- display knowledge of the principles of heat transfer

Skills and abilities

- demonstrate the ability to calculate Gibb's free energy
- demonstrate the ability to calculate heat transfer (Fourier's Law, Newton's Law of Cooling, Stefan-Boltzmanns Law, etc.)

Judgement and approach

- demonstrate ability to assess equilibrium criteria following mathematical calculations.

### Contents

The course addresses basic theoretical knowledge in flow calculations, heat transfer and thermodynamics related to manufacturing technology and casting.

The course contains the following elements:

- Definition of thermodynamic terms: enthalpy, entropy, Gibb's free energy and phase diagrams
- Thermodynamic laws
- Flow calculations theory: fluid flow, continuity equation, Bernoulli equation, lamellar and turbulent flow
- Heat transfer: heat conduction, heat convection and heat radiation.

### Type of instruction

Lectures and exercises.

The teaching is normally conducted in Swedish, but can occasionally be in English.

### Prerequisites

General entry requirements and completed courses Manufacturing Technology, 6 credits and Multivariable Calculus 7.5 credits (or the equivalent).

### Examination and grades

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

Registration of examination:

Name of the Test	Value	Grading
Examination <sup>I</sup>	2 credits	5/4/3/U
Assignments	1 credit	U/G

<sup>I</sup> Determines the final grade of the course, which is issued only when all course units have been passed.

### Course literature

The literature list for the course will be provided 8 weeks before the course starts.

Compendium in Thermodynamics provided/sold by JTH.