



COURSE SYLLABUS

Basic Thermodynamics and Transport Phenomena, 3 credits

Grundläggande termodynamik och transportfenomen, 3 högskolepoäng

Course Code: TGTK19	Education Cycle: First-cycle level
Confirmed by: Dean Dec 1, 2018	Disciplinary domain: Technology
Revised by: Director of Education Feb 21, 2024	Subject group: MT1
Valid From: Jan 1, 2025	Specialised in: GIF
Version: 3	Main field of study: 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 conducted 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 ^I	2 credits	5/4/3/U
Assignments	1 credit	U/G

^I 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.