



COURSE SYLLABUS

Basic Thermodynamics and Transport Phenomena, 3 credits

Grundläggande termodynamik och transportfenomen, 3 högskolepoäng

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| Course Code: TGTK19 | Education Cycle: Basic level |
| Confirmed by: Dean Dec 1, 2018 | Disciplinary domain: Technology |
| Valid From: Jan 1, 2019 | Subject group: MT1 |
| Version: 1 | Specialised in: GIF |
| | 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 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 ^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 is preliminary until one month before the course starts

Compendium in Thermodynamics provided/sold by JTH.