



Course syllabus

Faculty of Technology

Kalmar Maritime Academy

1DU28D Ånga och värmeöverföring I, 5 högskolepoäng

1DU28D Steam and Heat Transfer I, 5 credits

Main field of study

Energy Technology

Subject Group

Energy Technology

Level of classification

First Level

Progression

G1F

Date of Ratification

Approved by Faculty of Technology 2019-01-12

The course syllabus is valid from autumn semester 2019

Prerequisites

Thermodynamics 5 credits or equivalent.

Objectives

After completing the course, the student should be able to:

- describe and give examples of the coating effect in heat transferring equipment
- describe relevant parts of the regulations regarding steam and pressure installations?
- describe the area's technical development.
- account for the construction, components and function of steam installations
- account for heat flow through several layers including heat conduction, convection and radiation
- account for heat transfer with different types of heat exchangers and various techniques for heat transfer with heat exchanger
- apply basic steam and heat technical calculation to steam and heating plants and its main components.
- apply basic calculation in heat transfer through several layers and in different media.
- apply basic calculation in heat transfer through radiation and convection.
- apply basic heat balance calculations

- evaluate the contamination of heat-transferring surfaces from an operating economic perspective

Content

- Steam and heating systems and their working methods, construction, components, safety equipment and regulations
- Steam facilities and its thermodynamic efficiency
- Hot oil system
- Heat transfer through conduction, convection and radiation
- Heat conductivity, heat transfer coefficient and heat throughput coefficient
- Heat flow through several layers and cylindrical surfaces
- Insulation, multi-layer walls with air gaps and moisture barrier
- Coating on heat transfer surfaces
- Industrial heat exchanger, its properties and applications
- Heat transfer at co-current, counter-current and cross-flow heat exchangers

Type of Instruction

Instructions consists of lectures and graded exercises.

Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

In order to obtain the grade Pass with Distinction (VG), the student must receive the grade Pass with Distinction (VG) on the written examination.

Knowledge assessment takes place as follows:

- individual written exam, assessment of exercise performance

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty and at the Kalmar Maritime Academy.

Credit Overlap

The course cannot be included in a degree along with the following course/courses of which the content fully, or partly, corresponds to the content of this course: 1FT16T, 5 credits

Required Reading and Additional Study Material

Alvarez, Henrik, *Energy Engineering, Part 1 and 2, chapter 5.3 and 9*. Lund: Student literature. Latest edition. (257 pages)

Technical formula handbook, Kalmar Maritime Academy

Lesson materials, Kalmar Maritime Academy

Mollier diagram for water-steam