
Thermodynamics and Heat and Mass Transfer (6 ETCS)

Responsible Staff Member: Prof. M. Bestehorn,

Location of the courses: Faculty 1

Lecture: 2 hours/week + Exercise

Language: English

Learning outcome:

Students acquire profound working skills in the fields of thermodynamics. The course conveys the ability of applying theoretical formalisms in this field, to solve corresponding tasks independently and demonstrates the methods of attaining new perceptions.

Contents:

- Basics

Composition of thermod. systems, thermod. equilibrium, definition of temperature and heat, energy and first law, equations of state, mechanical equilibrium, chemical equilibrium

- Reversible Processes

Possible and impossible processes, quasi-static and reversible proc., relaxation times

and irreversibly, entropy and second law, heat flow, cyclic processes, Carnot Cycle, coefficients of Engine, heat pumps

- Irreversible Thermodynamics and Heat Transfer

Affinities and fluxes, resistive and linear systems, Onsager reciprocity, diffusion, convection, radiation, thermal conductivity, heat equation, convection equation, transport equation

References: H.B Callen, Thermodynamics

Assessment Mode:

Oral exam, duration 45 min.

Withdrawal from Examination:

until the end of the seventh week of the lecture period