



COURSE TITLE: Heat Exchangers

Number of contact hours: 45

Duration: 1 semester (spring)

ECTS credits: 4

Programme description:

The aim of the course is to provide the basic theory of the heat exchanger and its design principles. The course aims to familiarize students with the basic types of exchangers and their purpose. The course will introduce the phenomena of heat transfer and thermodynamics occurring in exchangers. The course is designed to provide details of exchanger construction and maintenance aspects.

Learning Objectives: a) The student is acquainted with the construction of heat exchangers and with the "mean logarithmic temperature difference" method for thermal design of heat exchangers. b) The student is familiar the "NTU" method for the thermal design of heat exchangers. c) To be able to select the right type of exchanger for the right technical applications.

Course Outline:

1. Heat transfer: convection, conduction, radiation
2. First principle of thermodynamics for heat exchangers
3. Logarithmic mean temperature difference LMTD
4. NTU method for calculating heat exchangers
5. Shell-and-tube heat exchangers
6. Plate heat exchangers
7. Compact heat exchangers

Course type: a) Lectures (15): Heat exchanger design theory. b) Project: Design of heat exchanger (15), c) Laboratory: heat exchanger investigation

Literature:

1. Kakac S.: Heat Exchangers: Selection, Rating, and Thermal Design, NY, 1995, CRC Press
2. W.S. Janna—Engineering heat transfer, 2009, CRC Press

Assessment method: Project: 60% of the final grade, Laboratory 40% of the final grade

Lecturer: Prof. Artur Cebula

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