

Module Name	Heat Exchange
Module Number	Eul-RES-C-WÜ
Responsible Lecturer	Prof. Dr.-Ing. M. Beckmann michael.beckmann@tu-dresden.de
Qualification Objectives	Students understand the fundamental mechanisms of heat transfer and can apply the associated transport equations. They are familiar with steady-state processes of heat conduction, heat transfer through convection, and radiation for various ideal and real-world practical problems. Students master the derivation of solution methods for addressing transient heat transfer and can apply these methods to various ideal and real-world practical problems. They are capable of balancing heat exchangers. Students are familiar with practical examples of heat transfer and can derive, understand, and analyze corresponding ideal and real-world processes in practice.
Contents	The module covers the fundamental principles for applying the conservation laws of mass, energy, and momentum in conjunction with the transport laws for thermal energy in conduction, convection, and radiation for ideal and real-world processes, as well as the phenomenological description of heat transfer mechanisms. Additional focal points include steady-state and transient problems of heat conduction, heat transfer on fins, heat transfer through multilayered bodies (e.g., plates, cylinders, or spheres), the calculation of heat exchangers, and the optimization of heat transport processes.
Teaching and Learning Forms	2 hours per week of lectures, 2 hours per week of exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Introduction to Analysis and Algebra, Multidimensional Differential and Integral Calculus, Physics, and Thermodynamics Basics are required.
Usability	The module is a compulsory module in the basic studies of the diploma program in Renewable Energy Systems.
Prerequisites for the Award of Credit Points	Credit points are awarded when the module examination is passed. The module examination consists of a written exam lasting 120 minutes.
Credit Points and Grades	5 credit points can be earned through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the Module	The module is offered every summer semester.
Workload	The total workload is 150 hours.
Duration of the Module	The module lasts one semester.