

Module Name	Communication Technology in Thermal and Electrical Power Engineering
Module Number	Eul-RES-E-KTET
Responsible Lecturer	Prof. Dr.-Ing. habil. J. Seifert joachim.seifert@tu-dresden.de
Qualification Objectives	After completing the module, students are familiar with the methodology for the systemic design and optimization of digital infrastructures with a particular focus on energy technology in the areas of provision, distribution, and application, as well as in the sectors of gas, heat, and electricity. Students master various methods of data acquisition and evaluation for energy technology systems, as well as the optimized control of decentralized energy systems.
Contents	The module covers various methods of data transmission with a particular focus on sector coupling in energy technology, the requirements of different energy markets for data provision, the current state of digitalization, and current applications such as smart home systems, virtual power plants, and intelligent metering systems. Additional topics include the technical fundamentals of energy-economic communication protocols and their specific system architectures in the areas of provision, storage, distribution, and application in energy sectors such as electrical energy technology, gas technology, and heat technology. Further content includes the structured preparation and analysis of forecast and measurement data in the form of simple evaluation algorithms for monitoring, as well as complex optimization strategies. Another focus of the module is on modern, complex analysis methods, including hardware-in-the-loop and human-in-the-loop procedures.
Teaching and Learning Forms	4 hours per week of lectures, 1 hour per week of exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Fundamentals of Thermodynamics and Electrical Power Engineering are required.
Usability	The module is an elective module from the elective area "Competence Deepening" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO in the diploma program 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 180 minutes.
Credit Points and Grades	7 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 winter semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.