

Module name	Systems Theory
Module number	Eul-ET-C-SysTh, Eul-IST-C-SysTh, Eul-MT-C-SysTh
Lecturer in charge	Prof. Dr.-Ing. Rafael F. Schaefer rafael.schaefer@tu-dresden.de
Objectives	After completing the module, students will be familiar with the organizing significance of the concept of systems in engineering as well as the general conceptual and methodological foundations for describing dynamic processes in nature and technology. They will be able to view static and dynamic systems from a uniform system-theoretical point of view and describe and analyze them mathematically. They know the properties of continuous-time and discrete-time systems in the time and image domain and are proficient in the use of signal transformations to effectively describe system behavior in the image domain. In particular, they are able to apply systems theory thinking to important areas of their field of study, for example to the calculation of electrical networks with non-sinusoidal or stochastic excitation and to the realization of systems with desired transmission behavior in discrete-time form such as digital filters.
Contents	The contents of the module are the basics of system theory with a focus on analog signals and systems with continuous time, analog signals and systems with discrete time, digital systems, stochastic signals and systems as well as selected applications.
Modes of teaching and learning	4 hours per week lectures, 4 hours per week exercises and self-study.
Prerequisites	The skills to be acquired in the module Introduction to Analysis and Algebra, Calculus for Functions with Several Variables and Basics of Electrical Engineering are required.
Usability	The module is a compulsory module in the basic studies of the degree programmes Electrical Engineering, Information Systems Engineering and Mechatronics. It creates the prerequisites for the modules that list that module in the "Prerequisites" field.
Requirements for the award of credit points	The credit points are awarded when the module assessment is passed. The module assessment consists of a written exam of 120 minutes.
Credit points and grades	9 credit points can be obtained by the module. The module grade is the grade of the examination.
Frequency	The module is offered every academic year beginning in the winter semester.
Workload	The total effort is 270 hours.
Duration	The module takes two semesters.

