

Module Name	Operating Systems
Module Number	INF-IST-E-BS
Responsible Lecturer	Prof. Dr. Horst Schirmeier horst.schirmeier@tu-dresden.de
Qualification Objectives	Students gain a deeper understanding of operating systems and are able to identify and avoid phenomena such as deadlocks during computer operation. They are familiar with system-level and concurrent application programs and can develop these using modern programming paradigms to efficiently utilize system services. They master the handling of system resources and understand the interaction of specific hardware properties with system components.
Contents	The module covers the fundamentals of the structure and functionality of operating systems, advanced concepts such as concurrency, virtualization, locality, system security, and fault tolerance, based on central abstractions like processes, threads, and memory. This includes strategies for process and I/O allocation, buffering, main and background memory management, as well as modern programming paradigms for handling concurrency, building on the basics of parallel programming, such as race conditions and system-level synchronization mechanisms.
Teaching and Learning Forms	2 hours per week of lectures, 2 hours per week of exercises, and self-study.
Prerequisites for Participation	The competencies acquired in the modules Programming and RoboLab, Algorithms and Data Structures, as well as Computer Architecture and Hardware Lab, particularly regarding the structure and organization of computer architecture and imperative programming, are required.
Usability	The module is an elective module from the elective area "Orientation" according to § 6 paragraph 3 of the study regulations and § 33 paragraph 3 of the examination regulations of the main study program in the diploma program Information Systems Engineering. It creates the prerequisites for the modules that list this module under "Prerequisites for Participation."
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 90 minutes. A bonus for the written exam can be earned by solving exercises with a workload of 15 hours.
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 winter semester.
Workload	The total workload is 150 hours.
Duration of the Module	The module lasts one semester.