

Data field	Explanation
Module number	M07
German title / English title	Netzwerktechnik / Network Engineering
Credits	5 ECTS
Workload	51 Contact hours (3 SWS SU), 99 Hours of independent study
Subject coverage	Subject-specific specialization
Learning outcomes	Students know and understand design criteria applicable to local and wide-area networks. They have a working knowledge of defining properties and principles of packet-based carrier-networks. They can analyse and create addressing and naming schemes for IP-based networks and understand current trends in networking research and standardisation. They know protocols and tools for operation, management and troubleshooting of networks.
Requirements	none
Level	2. Semester
Type of module	Seminar
Status	Required module
Semesters when offered	Summer semester
Method of assessment / Type of examination	The method of assessment / type of examination must be defined by the lecturer within the deadline determined in §19 (2) RSPO. Should the deadline pass without determination of the form of assessment in the module, the following method of assessment / type of examination applies: SU: Written examination (90 minutes)
Grade assessment	See study and examination regulations
Content	<ul style="list-style-type: none"> • Structured Network Design and Analysis of requirements • Definition and analysis of technical goals, such as performance, security, usability and availability • Definition of addressing concepts in IPv4/IPv6 (VLSM, CIDR) • Strategies and properties of naming in the Domain Name System (DNS) • Understand choices and properties for physical connectivity • Structured cabling for campus and datacentre networks: pros and cons of selected transport media • Properties of characteristic network topologies • Ethernet: History, Transparent Bridging, Switching Loops und Spanning Tree Protocol, Virtual LAN concepts (VLANs, Provider-based LANs) • Designing of modular campus networks through the separation of Core, Distribution and Access Layer • Understand approaches and protocols for network management • Test and validation of function, performance and other quality criteria • Understanding design-principles for communication protocols • Principles of Software-Defined Networking • Hands-on exercises to subnetting in IPv4/6 and availability concepts • Classroom discussion and presentations of scientific papers/methods relevant to the field
Reading list	J. Day: Patterns in Network Architecture, Prentice Hall Andrew S. Tanenbaum: Computer Networks. Pearson Studium J. Kurose und K. Ross: Computer Networking. Pearson Studium
Further information	Language employed in the module: English
Required Room type	SU-Sem