TECHNISCHE HOCHSCHULE LÜBECK

Module: Computer Networks

Level	Bachelor	**Short Name**	CN
Responsible Lecturers	Hellbrück, Horst, Prof. Dr.-Ing.		
Department, Facility	Electrical Engineering and Computer Science		
Course of Studies	Information Technology, Bachelor		
Compulsory/elective	Compulsory	**ECTS Credit Points**	5
Semester of Studies	6	**Semester Hours per Week**	4
Length (semesters)	1	**Workload (hours)**	150
Frequency	SuSe	**Presence Hours**	60
Teaching Language	English	**Self-Study Hours**	90
The following section is filled only if there is **exactly one** module-concluding exam.			
Exam Type	Portfolio Exam	**Exam Language**	English
Exam Length (minutes)		**Exam Grading System**	One-third Grades
Learning Outcomes	After completing the course students are able to • explain the structure and functions of reference models • explain important terms in networking as well as understand and explain the difference between service and protocol • based on a given application, students are able to derive quality of service requirements for the underlying network and design protocols to meet these requirements • students are able to design, set up and maintain a network		
Participation Prerequisites			
The previous section is filled only if there is **exactly one** module-concluding exam.			
Consideration of Gender and Diversity Issues	✔ Use of gender-neutral language (THL standard) ✘ Target group specific adjustment of didactic methods ✔ Making subject diversity visible (female researchers, cultures etc.)		
Applicability			
Remarks			

TECHNISCHE HOCHSCHULE LÜBECK

Module Course: Computer Networks (Lecture)

(of Module: Computer Networks)

Course Type	Lecture	**Form of Learning**	Presence
Mandatory Attendance	no	**ECTS Credit Points**	3
Participation Limit		**Semester Hours per Week**	3
Group Size		**Workload (hours)**	90
Teaching Language	English	**Presence Hours**	45
Study Achievements ("Studienleistung", SL)		**Self-Study Hours**	45
SL Length (minutes)		**SL Grading System**	

The following section is filled only if there is a course-specific exam.

Exam Type		**Exam Language**	
Exam Length (minutes)		**Exam Grading System**	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents

1. Reference Models (workload 5h)
- OSI Reference Model 7 Layers, Functions and Services

2. LANs (workload 20h)
- Ethernet – IEEE 802.3
- Transparent Switches
- Spanning Tree
- Virtual LANs

3. Network Layer (workload 35h)
- Tasks of Network Layer
- Addressing, Subnetting, Fragmentation, Multiplexing
- Routers, Routing Protocols OSPF, BGP
- Internet Protocol IPv4 and IPv6
- Helper protocols DHCP, NAT, ARP

4. Transport Layer (workload 15h)
- Tasks of Transport Layer
- User Datagram Protocol UDP / Transmission Control Protocol TCP
- Application Programming Interface APIs

5. Application Layer (workload 15h)
- Domain Name Service
- File Transfer Protocol

	• E-mail Protocols • Hypertext Transfer Protocol HTTP • Quality of Service
Literature	Andrew S. Tanenbaum: Computer Networks, Prentice-Hall James F. Kurose, Keith W. Ross: Computer Networking: A Top-down Approach featuring the Internet, Prentic-Hall Jochen Schiller: Mobile Communications, Addison-Wesley G. Coulouris, J. Dollimore, T. Kindberg: Distributed Systems: Concepts and Design Silberschatz, Galvin, Gagne: Operating System Concepts, Wiley
Remarks	

Module Course: Computer Networks (Exercises)

(of Module: Computer Networks)

Course Type	Exercise	**Form of Learning**	Presence
Mandatory Attendance	no	**ECTS Credit Points**	2
Participation Limit		**Semester Hours per Week**	1
Group Size	12	**Workload (hours)**	60
Teaching Language	English	**Presence Hours**	15
Study Achievements ("Studienleistung", SL)		**Self-Study Hours**	45
SL Length (minutes)		**SL Grading System**	

The following section is filled only if there is a course-specific exam.

Exam Type		**Exam Language**	
Exam Length (minutes)		**Exam Grading System**	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	Exercises and practical tasks to the following topics • Services and protocols for different OSI layers • Switches and LANs, VLANs • Routers & routing protocols, fragmentation, forwarding • Transmission Control Protocol, segments and reliable data transfer
Literature	See literature for the lecture
Remarks	