Module name										
Communication Networks I										
Module nr.		Credit points	Workload	Self-study	Module duration	Module cycle				
18-sm-1010		6 CP	180 h	120 h	1 Term	Summer term				
Language			Module owner Draf. Dr. Ing. Balf Stainmatz							
Ger	German			Prof. DrIng. Ralf Steinmetz						
1	 Teaching content In this class the technologies that make today's communication networks work are introduced and discussed. This lecture covers basic knowledge about communication networks and discusses in detail the physical layer, the data link layer, the network layer and parts of the transport layer. The physical layer, which is responsible for an adequate transmission across a channel, is discussed briefly. Next, error control, flow control and medium access mechanisms of the data link layer are presented. Then the network layer is discussed. It comprises mainly routing and congestion control algorithms. After that basic functionalities of the transport layer are discussed. This includes UDP and TCP. The Internet is thoroughly studied throughout the class. Detailed Topics are: ISO-OSI and TCP/IP layer models Tasks and properties of the physical layer Physical layer coding techniques Services and protocols of the data link layer Flow control (sliding window) Applications: LAN, MAN, High-Speed LAN, WAN Services of the network layer Routing algorithms Broadcast and Multicast routing Congestion Control Addressing Internet protocol (IP) Internet working Services and protocols of the transport layer TCP, UDP 									
2	Learning objectives This lecture teaches about basic functionalities, services, protocols, algorithms and standards of network commu- nication systems. Competencies acquired are basic knowledge about the lower four ISO-OSI layers: physical layer, datalink layer, network layer and transport layer; Furthermore, basic knowledge about communication networks									
	is taught. Attendants will learn about the functionality of today's network technologies and the Internet.									
3	Recommended prerequisites for participation									
4	 Form of examination DefaultModule exam: DefaultModule exam (Technical examination, Examination, DefaultDuration: 120 Min., Default RS) 									
5	Prerequisite Passing the	Prerequisite for the award of credit points Passing the final module examination								
6	Grading DefaultMod • Defaul	ule exam: ltModule exam (Tech	nical examinatior	n, Examination, We	ighting: 100 %)					

7	Usability of the module Wi-CS, Wi-ETIT, BSc CS, BSc ETIT, BSc iST								
8	Grade bonus compliant to §25 (2) Grade improvement is achieved by solving voluntary additional assignments due weekly in writing during the lecture period. The maximum grade improvement is 1.0. For a grade improvement to be awarded, a minimum number of points (50% of the maximum achievable points) must be reached. Above this minimum number, the grade improvement increases proportionally (from 0.0 grade improvement at the minimum number to a maximum of 1.0 grade improvement at 95% of the maximum achievable points). Above 95% of the maximum achievable points, the bonus is 1.0. Components of the additional assignments can be classical exercises, answering quizzes, creating wiki articles or quizzes. Participation in these is mandatory to receive the grade improvement. The grade improvement has no influence on passing the exam.								
9	 References Selected chapters from the following sources: Andrew S. Tanenbaum: Computer Networks, 5th Edition, Prentice Hall, 2010 Andrew S. Tanenbaum: Computernetzwerke, 5. Auflage, Pearson Studium, 2012 Larry L. Peterson, Bruce S. Davie: Computer Networks: A Systems Approach, 6th Edition, Morgan Kaufmann Publishers, 2021 Larry L. Peterson, Bruce S. Davie: Computernetze: Eine systemorientierte Einführung, 4. Auflage, Dpunkt Verlag, 2007 James F. Kurose, Keith W. Ross: Computer Networking: A Top-Down Approach Featuring the Internet, 8th Edition, Pearson, 2021 James F. Kurose, Keith W. Ross: Computernetzwerke: Der Top-Down-Ansatz, 6. Auflage, Pearson Studium 2014 R. Srikant, Jean Walrand, Shyam Parekh: Communication Networks: A Concise Introduction, 2nd Edition, Morgan & Claypool, 2017 Olivier Bonaventure: Computer Networking: Principles, Protocols and Practice, open ebook, https://www.computer-networking.info 								
Co	Courses								
	DefaultCourse Course name								
	18-sm-1010-vl Communication Networks I								
	Instructor Prof. DrIng. Ral	f Steinmetz	Type Lecture	SWS 3					
	DefaultCourse name nr. 18-sm-1010-ue Communication Networks I								
	Instructor Prof. DrIng. Ral	f Steinmetz	Type Practice	SWS 1					