

Modulbezeichnung:	Principles of Communications I
Kürzel für Stundenplan	COM I
Semester:	5
Modulverantwortliche(r):	Prof. Dr.-Ing. Horst Hellbrück
Dozent(in):	Prof. Dr.-Ing. Horst Hellbrück
Sprache:	Englisch
Zuordnung zum Curriculum	Bachelor International Study of Electrical Engineering
Lehrform / SWS:	Class: 4 SWS with exercises, max. 30 Students per group Laboratory: 1 SWS with integrated presentations held by the students, max. 3 students per group, max 4 groups in the lab.
Arbeitsaufwand:	80h presence (64 h class incl. exercises, 16 h lab.) 40 h preparation and evaluation for classes incl. exercises 60 h preparation and evaluation for lab plus presentation
Kreditpunkte:	6
Voraussetzungen:	
Lernziele / Kompetenzen:	Students should be able to <ul style="list-style-type: none"> • explain the structure and functions of reference models • explain important terms in networking and understand and explain 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
Inhalt:	See "Course Topics" in the Appendix
Literatur:	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
Studien-/Prüfungsleistungen:	written exam (120 min), presentation laboratory

Course Topics

1. Reference Models (workload 5h)

1.1 OSI Reference Model 7 Layers, Functions and Services

2. LANs (workload 50h)

2.1 Ethernet – IEEE 802.3

2.2 Transparent Switches

2.3 Spanning Tree

2.4 Virtual LANs

3. Network Layer (workload 55h)

3.1 Tasks of Network Layer

3.2 Addressing, Subnetting, Fragmentation, Multiplexing

3.3 Router, Routing Protocols RIP, OSPF, BGP

3.4 Internet Protocol IPv4 and IPv6

3.5 Multiprotocol Label Switching

4. Transport Layer (workload 35h)

4.1 Tasks of Transport Layers

4.2 User Datagram Protocol UDP / Transmission Control Protocol TCP

4.3 Application Programming Interface APIs

5. Application Layer (workload 35h)

5.1 Domain Name Service

5.2 File Transfer Protocol

5.3 E-mail Protocols

5.4 Hypertext Transfer Protocol HTTP

5.5 Quality of Service

Lab Experiments:

L1 : OSI Layers Service and Protocol

L2 : Switch and LANs, VLANs

L3 : Router and Routing Protocols, Fragmentation, Address Resolution Protocol

L4 : Transmission Control Protocol, Segments and Reliable Transfer

Presentation: Topics to be determined individually