Modulbeschreibung

Advanced Communication Networks

Module numbers:	41.4976 [PVL 41.4977]
Language:	english
Study programme:	Dualer Master 2021 - Katalog AS: Anwendungs- und systemorientierte Module Dualer Master 2021 - Vertiefung IS: IT Sicherheit Master 2021 - Katalog AS: Anwendungs- und systemorientierte Module Master 2021 - Vertiefung IS: IT Sicherheit Dualer Master 2013 - Katalog AS: Anwendungs- und systemorientierte Module Dualer Master 2013 - Vertiefung IS: IT-Sicherheit JIM 2013 - Elective Catalogue J Master 2013 - Katalog AS: Anwendungs- und systemorientierte Module Master 2013 - Vertiefung IS: IT-Sicherheit JIM 2006 - Courses Master 2006 - Katalog AS: Anwendungs- und systemorientierte Module Master 2006 - Vertiefung AE: Application Engineering Master 2006 - Vertiefung TK: Telekommunikation Master 2006 - Vertiefung TS: Technische Systeme Master 2006 - Vertiefung WI: Wirtschaftsinformatik MN Data Science 2022/2016 - Katalog M-I_I: Allgemeine Wahlpflicht Informatik
Type of course:	V+P = Lecture+Practical
Weekly hours:	3+1
Credit Points:	6
Exam:	written exam
PVL (e.g. Practical):	not graded (Conduct laboratory experiments, conduct projects, research, literature review, documentation, presentation.)
Required knowledge:	English language skills (understanding, speaking, reading, writing)
Learning objectives:	The following competencies shall be established: • Knowledge of fundamental structures and functions of packet-based telecommunication and data networks • Specifics of certain selected communication networks • Relationship to legacy telecommunication networks and services • Knowledge about the prevalent protocols, network and service functions • Analysis of such networks with an industry accepted tool set • Plan and evaluate packet-based networks • Readiness for the constant and fast changes in this field

Content:	The following topics shall be covered:
	• Requirements for large-scale telecommunication and data networks
	• Fixed and mobile access networks
	  ◦ Architectures
	  ◦ Transport technologies, e.g., DSL, DOCSIS, LTE
	  ◦ Used protocols, e.g., Ethernet, tunneling
	• Wide Area Networks (WAN)
	  ◦ Architectures
	  ◦ Employed protocols, e.g., MPLS
	  ◦ Local Area Networks (LAN)
	• Structure and function of selected network functions, e.g.,
	  ◦ IP router
	  ◦ AAA-Function (e.g., RADIUS and DIAMETER)
	  ◦ Packet Gateways
	  ◦ and further as needed
	• Structure and function of Quantum Key Delivery Networks (QKDN)
	  ◦ Technical foundation of QKDN
	  ◦ Security properties
	  ◦ Application in telecommunication networks
	• Structure of telecommunication networks
	  ◦ Network Operations (Operations Support System (OSS) and Business Support System (BSS))
	  ◦ Operator peering
	  ◦ Virtualized networks
	  ◦ Software-Defined Networks
	• Introduction to traffic and operational analysis
	  ◦ Measuring and analyzing network traffic
	  ◦ Planning of networks
	• Advanced topics based on current research issues

Literature:	• Internetworking with TCP IP, Comer • Computernetzwerke, Kurose & Ross • Datennetztechnologien für Next Generation Networks, Obermann & Horneffer Further references will be given in the lecture.
Lecture style / Teaching aids:	Seminary lecture and practical training, current scientific and technical publications, practical training in the telecommunications laboratory
Responsibility:	Martin Stiemerling