Technology
Arts Sciences
TH Köln

Course Manual AMC

Advanced Multimedia Communications

Version: 3 | Last Change: 29.04.2022 13:02 | Draft: 0 | Status: vom verantwortlichen Dozent freigegeben

General information

Long name	Advanced Multimedia Communications
Approving CModule	AMC_MaCSN, AMC_MaTIN
Responsible	Prof. Dr. Andreas Grebe Professor Fakultät IME
Valid from	winter semester 2020/21
Level	Master
Semester in the year	winter semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr. Andreas Grebe Professor Fakultät IME

Literature

J. Kurose, K. Ross: Computer Networking: A Top-Down Approach, Global Edition, Prentice Hall, 7th ed., 2016

A. S. Tanenbaum, D. J. Wetherall: Computer Networks, Pearson , 5th ed., 2013

W. Stallings: Foundations of Modern Networking, Pearson Education, 2016

H. W. Barz, G. A. Bassett: Multimedia Networks, John Wiley & Sons, 2016

T. Szigeti, C. Hattingh, R. Barton, B. Kenneth: End-to-End QoS Network Design: Quality of Service for Rich-Media & Cloud Networks (2nd Edition) End-to-End QoS Network Design: Quality of Service for Rich-Media & Cloud Networks, Cisco Press, 2nd Ed. 2013

R. Steinmetz, K. Nahrstedt: „Multimedia Systems“, Springer 2004

R. Steinmetz, „Multimedia-Technologie“, Springer 2000

Final exam

Requirements	Bachelor-level knowledge of protocols and layer models, Internet protocols (UDP, TCP, IP, HTTP, FTP), IP addressing (IPv4, IPv6), routing techniques (IP routing, functionality of a router, routing protocols, RIP, OSPF), transmission systems and layer 2 protocols, Ethernet. Understanding distributed systems and applications, sockets and client/server programming, request-response patterns, publishg-subscribe patterns.
Language	English
Separate final exam	Yes

Details	In a final examination (written, optionally oral), the students demonstrate their competences in summary form. The examination comprises the following sections, in which six taxonomy levels are included (reproducing, understanding, applying, analysing, synthesising, and evaluating). 1.) A good understanding of basic terminology, concepts and techniques. 2.) Application of planning and evaluation techniques. 3.) Evaluation of proposed solutions for correctness, identification of errors in statements or given networks.
Minimum standard	Achievement of the individual minimum score per exam, typically 50% of maximum score.
Exam Type	EN Klausur

− Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	Content for multimedia applications, encoding of multimedia data, integration of data, audio and video, multimedia traffic requirements, multimedia transport protocols, RTP and MPEG-TS, traffic modeling burst silence model, quality of service (QoS), multiservice networks, IntServ, RSVP, DiffServ, ToS and DSCP, Traffic Classification, Traffic Measurement, Traffic Shaping, Network Scheduling, Queueing (FIFO, RR, WRR, WFQ, CB-WFQ, PQ, LLQ), Congestion Avoidance (RED, WRED, CB-WRED), Quality-of-Exiperience (QoE), MOS Scale, Error Detection, Error Correction, FEC, Interleaving, Jitter Buffer.
Skills	Students evaluate technologies and network architectures of multiservice networks; they analyse requirements of Multimedia services and systems, design architectures for multiservice networks, implement multiservice networks, and analyze Multimedia communication protocols and their performance metrics.

Special requirements

IP Networking and Protocols (Bachleor Niveau)

Accompanying material	Online materials: Slides for the lecture Exercises sheets Tutorials for tools (e.g. Wireshark) Material collections such as IOS command list, ASCII character table Optional: Network simulator tool Cisco PacketTracer Optionally, participation in two Cisco Academy CCNA (Cisco Certified Network Associate) modules is possible. The contents of the CCNA 1 and CCNA 2 modules are then also available as material.
Separate exam	No

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0

− Practical training

Learning goals

Goal type	Description
Knowledge	Fundamental knowledge of multiservice networks or multimedia applications in All-IP networks including planning, implementation and evaluation of services. Protocol analysis for functional analysis, performance analysis and troubleshooting.
Skills	Students evaluate requirements of Multimedia services, and necessary methods for QoS in multiservice networks. They plan and implement IP Multimedia environments as team project, and test QoS performance measures. They are competent in functional analysis and troubleshooting by deep packet inspection (DPI) protocol analysis. They evaluate the performance of the Multimedia network or services in terms of timing, throughput, latency and delays, jitter, robustness in case of packet errors, and security aspects. Individual project proposals by students are wellcome.

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1
Tutorial (voluntary)	0

Special requirements

IP Networking and Protocols (Bachleor Niveau)

Accompanying material	Online materials: Default Lab Instructions Tutorials for tools (e.g. Wireshark) Links to HowTo/Websites Material collections such as IOS command list, ASCII character table Optional: Network simulator tool Cisco PacketTracer
Separate exam	Yes

Separate exam

Exam Type	EN praxisnahes Szenario bearbeiten (z.B. im Praktikum)
Details	Several lab appointments with different tasks are to be attended, to solve a lab project. The following tasks are to be completed: Independent solution of the planned tasks and milestone presentation. Preparation of a final report. Final presentation of the results.
Minimum standard	Successful participation in all lab dates. Successful implementation of the lab project.