Course
AMC - Advanced Multimedia Communications

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⌃ General information

Long name	Advanced Multimedia Communications
Approving CModule	AMC_MaCSN, AMC_MaTIN
Responsible	Prof. Dr. Andreas Grebe Professor Fakultät IME
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
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

Final exam

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

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3.) Evaluation of proposed solutions for correctness, identification of errors in statements or given networks.

^ Lecture / Exercises

Learning goals

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.

Expenditure classroom teaching

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

⌃ <u>Practical training</u>

Learning goals

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

Separate exam

Exam Type
working on practical scenarion (e.g. in a lab)

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.