Technology
Arts Sciences
TH Köln

Course
INF3 - Computer Science 3

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⌃ General information

Long name	Computer Science 3
Approving CModule	INF3_BaMT
Responsible	Prof. Dr.-Ing. Luigi Lo Iacono ehemaliger Professor Fakultät IME
Level	Bachelor
Semester in the year	winter semester
Duration	Semester
Hours in self-study	120
ECTS	7
Professors	Prof. Dr.-Ing. Luigi Lo Iacono ehemaliger Professor Fakultät IME
Requirements	Knowledge and competence in the development of computer programs and in the safe handling of a programming language (e.g. Java) as well as common development tools (e.g. IDE) are presupposed.
Language	German
Separate final exam	Yes

Final exam

Details

In a final examination (written, optional oral), the students demonstrate their competences summarily. The examination includes exemplary parts of the course.

Minimum standard

Achieving the individual minimum score per exam, typically 50% of the maximum score.

Exam Type

In a final examination (written, optional oral), the students demonstrate their competences summarily. The examination includes exemplary parts of the course.

^ Lecture / Exercises

Learning goals

Knowledge

- Fundamentals of network architectures (LAN, MAN, WAN, C/S, P2P)
- Fundamentals of network topologies (bus, star, tree, mesh)
- Metrics
- Communication and layer models according to ISO/OS and TCP/IP
- IEEE, bit transmission and data interconnections, Ethernet technology (ARP, hub, switch)
- IP addressing and subnetting, IP routing and routing protocols (IPv4, IPv6, ICMP, Router, DHCP)
- Frame switching and virtual LAN (MPLS)
- Transport protocols (TCP, UDP, QUIC)
- Application protocols (DNS, HTTP1/2/3)
- HTTP (Live) Streaming (HLS, MPEG DASH)
- Communication patterns (C/S, Request-Response, Publish-Subscribe)
- Network security (VPN, firewall)

Skills

- Planning and setting up (sub)networks
- Integrate systems into networks
- Analyze networks and systems using suitable tools and present measurement results
- Estimate and analyse the performance of computer networks
- Obtaining information from original English sources.

Expenditure classroom teaching

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

Separate exam

∧ Practical training

Learning goals

Knowledge

- Knowing, structuring, classifying basic concepts and technologies of computer networks
- Assigning and naming protocols in relation to according reference models
- Structuring tasks, assigning to relevant standardizations and transferring to network design and application classes
- Explaining protocol mechanisms, setting out and structuring tasks and technical parameters

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Skills

- Planning and setting up networks and (sub)systems
- Analyze networks and systems using suitable tools and present measurement results
- Systematic troubleshooting and correction
- Estimate and analyse the performance of computer networks
- Evaluate information from original sources and apply it to networks

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	2
Tutorial (voluntary)	0

Separate exam

Exam Type

interview (discussion) about special issues in scenario, project assignment or literature research

Details

The solutions worked out by the small student groups are documented in a written protocol. The minutes are presented, critically discussed and approved in a technical discussion.

Minimum standard

80% of the written protocols must have been defended and accepted during a technical discussion.