Technology
Arts Sciences
TH Köln

Course Manual 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
Valid from	winter semester 2021/22
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

Literature

J. Kurose, K. Ross: Computernetzwerke - Der Top-Down-Ansatz, Pearson Studium, 6. Auflage, 2014

A. Tanenbaum: Computernetzwerke, Pearson Studium, 5. Auflage 2012

Douglas Comer: Computer Networks and Internets, Pearson Education Limited, 6 edition, 2015

Internet-Standardisierung: IETF Standards (RFCs), www.ietf.org

LAN-Standards: IEEE, ieeexplore.ieee.org (freier Zugang über TH Köln)

Web-Standardisierung: W3C Standards, www.w3c.org

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	EN Klausur

− Lecture / Exercises

Learning goals

Goal type	Description
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.

Special requirements

none

Accompanying material	Lecture slides, lecture exercises, web resources, tutorials
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	- 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
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

Special requirements

none

Accompanying material	Exercise tasks, external resources, tools
Separate exam	Yes

Separate exam

Exam Type	undefined
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.