Valid from 2025.HS

Module description: Digital Communication Networks

Module Code	t.BA.ET.DCN.19HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	InES
Module Coordinator	Simon Künzli
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
Module Characteristic	Type 3a 2 lecture lessons per semester week and class+ 2 lab bi-weekly lessons per semester and half-class
Module Description	In virtually all modern applications, communication is an integral part. The aim of this course is to convey concepts, terms, protocols and mechanisms of data communication for the professional environment, so that students can correctly design and use data communication and solve fundamental problems.
Module Content	**Theory** • Basics of Communication Technology • Local Area Networks (Ethernet, Bridging) • Internet Protocols (IP, Routing) • Transport Layer (UDP, TCP) • Network Applications, Infrastructure Services and Protocols (DNS, SMTP, NTP, HTTP etc.) • Interface to Transport Layer (Socket API) **Lab exercises** • Protocol Analyzer • Ethernet • Bridging / VLANs • Routing • Internet Protocol IP • TCP • some selected and important Application Layer Protocols
Prerequisite Knowledge	

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Learning Objectives (Competences)

Students...	Competencies	Taxonomies
... understand the basic terminology, definitions, terms, measures etc. of the data communication and can apply them correctly.	F, M	K2, K3
... can explain the concept of the OSI reference model by examples and assign protocol functions and properties to the layers.	M, F	K2, K3
... understand Ethernet and the main protocols of the Internet Protocol Suite so that they can design and configure network interfaces and protocol functions.	F, M	K3
... understand Ethernet and the main protocols of the Internet Protocol Suite so that they can analyse processes in the network at different levels with the help of suitable tools.	M, F	K3, K4
... understand Ethernet and the main protocols of the Internet Protocol Suite so that they can diagnose easier problems and find solutions.	F, M	K3, K4
... can easily understand and extend client / server programs.	F, M	K2, K3

Performance Assessment

End-of-module exam	Assessment	Length (min.)	Weighting	Form
written exam		90	80	acc. to module agreement

Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form
Lab Exercises *Successful preparation and demonstration of lab exercises*	Grade	5	20	acc. to module agreement

Classroom Attendance Requirement

None

Labs require on-site presence.

Learning material

- Exercises
- Slides
- Lab instructions
- Script

Comments

Labs:
- Winterthur: TE524/TE528, together maximum 20 students
- Zurich: ZL O3.20 / O3.16 maximum 15 students each