# HE1033 Communication Networks 7.0 credits

## Kommunikationsnät

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for HE1033 valid from Autumn 2011

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

Basic knowledge in mathematics and digital electronics.

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

# Intended learning outcomes

The course is focused on principles, functions and structures for communication networks with an emphasis on the data link, network and transport levels in the model for communication between open systems.

After completing the course the participants should be able to

- explain the common models for data communication between open systems;
- solve problems related to flow control and retransmission according to "stop-and-wait", "go-back-N" and "selective reject" for data links;
- explain different access methods in local area networks (wired and wireless);
- explain methods for multiplexing in transmission networks
- explain the differences between networks based on datagrams, virtual circuits and circuit switched networks;
- dimension transmissions networks and circuit switched networks using basic traffic theory;
- explain functions realized in IPv4 and IPv6
- explain addressing in IP network and algorithms and protocols for routing
- apply addressing and routing in IP networks
- Explain the main functions in transport protocols, especially TCP
- Describe protocols and systems for monitoring of control of devices in buildings and homes

# Course contents

- Layered architectures of protocols and networks. The OSI model and the Internet protocols.
- Principles for flow control and error control on the data link level; link utilization
- Access methods in wireline and wireless local area networks and cellular wireless networks
- Local area networks standardization, protocols and configuration
- Networking principles: circuit switching, packet switching and virtual circuits
- Dimensioning of transmission networks
- Networking addressing using IPv4 and IPv6
- Algorithms and protocols for routing in IP networks
- Transport protocols: ports, flow control, error control and retransmissions, connection states
- Protocols and systems for monitoring and control of devices and
- Virtual circuit networks: cell-based networks, frame relay  functions in buildings and homes

# Course literature

Will be announced later

# Examination

- LAB1 - Laboratories, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 4.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

# Other requirements for final grade

Passed written exam (TEN1, 4p), grades A-F
Passed lab assignments (LAB1 3p), grades pass or fail
Total grades A-F

# Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.