



HI1M00 Communication Networks 7.5 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 HI1M00 valid from Autumn 2007

Grading scale

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

Education cycle

First cycle

Main field of study

Information Technology, Technology

Specific prerequisites

Basic knowledge in data communication, i.e. Data Communication and Networks.

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 and architectures for communication networks with an emphasize on the system level and the lower layers of the open system for data communications.

After completing the course the participants should be able to

- explain the common models for data communication between open systems;
- calculate essential parameters such as attenuation, channel capacity, bit and baud rate etc. for an ideal communication channel and a channel with noise;
- understand and solve problems regarding basic modulation and channel encoding;
- perform cyclic redundancy check (CRC) for error detection;
- 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 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 the functions implemented in the Internet protocol (IP);
- briefly understand the transport layer functions.

Course contents

- Layered architectures of protocols and networks, the OSI model and the Internet protocols.
- The physical layer: Transmission media, coding, modulation
- Transmission networks: Pulse code modulation (PCM), multiplexing, networks based on synchronous digital hierarchy (SDH), optical networks
- The data link layer: Error detection, error control, retransmission, link utilization
- Local area networks: Network topologies, access methods, DSMA/CD, LAN standards, bridges and switches
- The network layer: Addressing, routing, packet switching, circuit switching, and cell-based switching
- The Internet protocol. Routing protocols
- Telephony networks: mobile networks, signaling
- Virtual circuit networks: Cell-based networks, frame relay
- Network planning and applied traffic theory

Examination

- LAB1 - Laboratory Work, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 4.5 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.

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.