# IK1203 Networks and Communication 7.5 credits

## Nätverk och kommunikation

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 IK1203 valid from Autumn 2018

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

Completed upper secondary education including documented proficiency in Swedish corresponding to Swedish B and English corresponding to English A. For students who received/will receive their final school grades after 31 December 2009, there is an additional entry requirement for mathematics as follows: documented proficiency in mathematics corresponding to Mathematics A. And the specific requirements of mathematics, physics and chemistry corresponding to Mathematics D, Physics B and Chemistry A.

## Language of instruction

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

## Intended learning outcomes

The goals of the course is to teach the basics of networking and communication. For those interested in specializing in networking, it provides the fundamentals on which later courses build.

For those focusing on other areas of IT, it provides the basic knowledge needed to understand how networks and communication can be securely and effectively utilized in systems and applications.

After completing the course, students should be able to

- describe and explain the basic terminology used in networking and communication
- analyse communication scenarios and application requirements, and explain what methods and algorithms are suitable to use for a desired communication service
- explain, model and analyse the behaviour of networks using different methods for error control, flow control and congestion control, and predict how such a system will react in response to different events and conditions
- explain the functions of protocols of the different layers of the Internet model, and how different layers interact with each other
- explain and implement basic algorithms and mechanisms for error detection, error correction, flow control, congestion control and routing
- design, implement and analyse the behaviour of basic Internet applications and their protocols
- explain different functions and concepts concerning equipment for communication and networks
- compute and/or approximate the performance of communication systems, and suggest improvements.

## Course contents

- Flow control and error control: flow control (stop&wait, sliding window), error detection and error handling, error correcting codes, retransmission (ARQ).
- Layered models: overview of OSI and TCP/IP.
- LAN (Local Area Network) and LAN-systems: topologies, access- techniques and protocols, token ring, Ethernet, wireless networks bridged networks, spanning tree computation and VLAN.
- Packet and circuit switching: WAN (Wide Area Network) and public networks, principles, characteristics and protocols.

- Internetworking and IP: design principles and building blocks, connection oriented vs. connectionless protocols, Internet routing and Internet Protocol (IP).
- Transport layer protocols: TCP, UDP.
- Communcation models: "Client-server" and "peer-to-peer".
- Applications: DNS, SMTP, FTP, HTTP, Telnet mm.
- Network programming.

## Course literature

James F. Kurose, Keith W. Ross: Computer Networking: A Top-Down Approach, Global Edition, 7/E. ISBN-10: 1292153598, ISBN-13: 9781292153599. Pearson/Addison Wesley.

## Examination

- LABA - Laboratory Work, 3.0 credits, grading scale: P, F
- TENA - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- UPG1 - Assignment, 1.5 credits, grading scale: P, 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.