EP1100 Data Communications and Computer Networks 7.5 credits

Datakommunikation och datornät

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 EP1100 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

Language of instruction

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

Intended learning outcomes

The purpose of the course is to provide an overview of communication network functions and a good foundation for further studies in the subject. It involves understanding and application of design principles and methods for systems development and review of the underlying systems, and communications technologies and significant standardized systems.

The course provides instruction in data communication and computer networks through lectures, tutorials and laboratory work as well as reading instructions and training materials for the student's own work.

After the course, students should be able to:

- Understand and be able to explain the principles of a layered protocol architecture; be able to identify and describe the system functions in the correct protocol layer and further describe how the layers interact.
- Understand, explain and calculate digital transmission over different types of communication media.
- Understand, explain and solve mathematical problems for data-link and network protocols.
- Describe the principles of access control to shared media and perform performance calculations.
- Understand and explain the principles and protocols for route calculations and be able to perform such calculations.
- Understand and explain reliable transmission and calculate the performance of TCP connections.
- Understand and be able to describe for common services, system services, such as name and address lookups, and communications applications.

Course contents

- System architecture and layered protocol models, with an overview of OSI and TCP/IP.
- Data transfer and physical infrastructure: analog and digital transmission, line coding and modulation, transmission media, capacity and power calculations, multiplexing, asynchronous and synchronous transmission.
- Data link protocol: framing of data, functions, flow control, error detection and control, and retransmission.
- Local networks: topologies, access control, such as random access (CSMA) wireless networks (WiFi), bridged networks and standards in the IEEE 802 group.
- Packet-switched public networks, principles and protocols: connection-oriented and connectionless; the internet protocol IP; routing protocols and algorithms for both intra- and inter-domain routing.

- Transport protocols: reliable and unreliable transmission; TCP and UDP. Congestion control and fault handling; communication between processes; connection management; examples of applications and services.

Disposition

Lectures, recitations and labs.

Course literature

B. A. Forouzan: Data Communications and Networking, 3:e uppl., McGraw-Hill 2004. ISBN 0-07-251584-8.

Examination

- LAB1 - Laboratory Work, 2.5 credits, grading scale: P, F
- TEN1 - Examination, 5.0 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 labs.
Written exam.

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.