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

On 2021-10-14, the Head of the EECS School has decided to establish this official course syllabus to apply from spring semester 2022, registration number J-2021-1565.

Grading scale

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

Education cycle

First cycle

Main field of study

Information Technology,Technology

Specific prerequisites

Knowledge and skills in programming, 3 credits, equivalent to completed course DD1337/DD1310-DD1318/DD1321/DD1331/DD100N/ID1018/SF1519.

Active participation in a course offering where the final examination is not yet reported in LADOK is considered equivalent to completion of the course.

Registering for a course is counted as active participation.

The term 'final examination' encompasses both the regular examination and the first re-examination.

Language of instruction

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

Intended learning outcomes

After passing the course, the student should be able to:

- explain principles and parts of system architectures for networks and describe system functions in the architecture that are necessary for functioning networks summarise and explain how networks as a whole function
- explain, calculate and discuss data communication and data links for both point-to-point and shared links describe necessary functions for links with correct descriptions and to carry out calculations of capacity, error handling and throughput
- explain network structures and principles of addressing and routing with correct terminology and distinguish and discuss networks on data link network layer carry out routing calculations and describe protocols for packet switching
- explain and illustrate the concepts of application and service and describe the function of given systems and user applications explain the functions in the transport protocol for reliable transfer with correct descriptions and apply them on selected problems

Course contents

This course covers communication networks based on the physical communication (by means of electric signals or electromagnetic waves) to the use of communication services over a net, such as the Internet. This corresponds to the following course modules:

Computer Networks - how data can be communicated between two parties with arbitrarily low probability of error.

Data links and local networks - a data link can be used by several senders to reach several receivers and to build local networks.

The multi-link nets - when larger networks are needed both for increased distances and to serve large numbers of users, a network must be built with many links connected by switches or routers. There can be several paths for a data packet to reach the receiver and the network must calculate routes and choose the one that should be used.

Transport and applications - the network offers connections for delivering data between sending and receiving computers as if they had a dedicated link connecting them. Applications then utilise this communication service.

System architecture and standards - communication networks are complex technical systems which are handled through an architecture of the system. To make it possible for different solutions and suppliers of system components, standards are necessary for compatibility to provide the intended service.

Examination

- KONA - Partial exams, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- PRO1 - Project work, 3.0 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.

The examination runs and is reported continuously during the course offering. Re-examination takes place in the form of a written exam in a retake period.

Transitional regulations

One that has passed one or more of the old examination modules KON1, KON2 and KON3 can be examined on the remaining ones. One that has all three of KON1, KON2 and KON3 left should instead make KONA.

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.