UNIVERSITY OF GOTHENBURG

COMPUTER SCIENCE AND ENGINEERING

DIT423 Computer communication, 7.5 credits

Datakommunikation, 7,5 högskolepoäng

First Cycle

Confirmation

This course syllabus was confirmed by Department of Computer Science and Engineering on 2017-02-10 and was last revised on 2017-06-07 to be valid from 2017-08-20, autumn semester of 2017.

Field of education: Science 100%
Department: Computer Science and Engineering

Position in the educational system

The course is offered within the framework of several degree programmes. The course is also a single subject course at the University of Gothenburg.

The course can be part of the following programmes: 1) Computer Science, Master's Programme (N2COS), 2) Applied Data Science Master's Programme (N2ADS) and 3) Computer Science, Bachelor´s Programme (N1COS)

Main field of studies	*Specialization*
Computer Science	G1F, First Cycle, has less than 60 credits in first-cycle course/s as entry requirements

Entry requirements

The requirement for the course is to have succesfully completed 45 hec within the area of Computer Science or equivalent, including the following;

- a 7.5 hec course on fundamentals of digital systems and computer organisation (DIT791 Introduction to computer engineering, or equivalent),
- a 7.5 hec course in imperative/object oriented programming (DIT012, DIT952, or equivalent),
- a 7.5 hec course in discrete mathematics (DIT980 or equivalent).

Learning outcomes

On successful completion of the course the student will be able to:

Knowledge and understanding

- distinguish the different network layers, their services and the related protocols;
- describe clearly the two standard reference models, exemplify and define the major problems in each of these models;
- explain how such problems have been tackled by, for example, solutions adopted in todays networks (e.g. in the Internet) and other possible solutions;
- clarify how constraints in the currently existing reference models can place obstacles to other options for solving the main problems;

Competence and skills

- build and configure a working network and have an understanding of computer configuration and routing issues in networks;

Judgement and approach

- demonstrate gained experience by doing practical work and being able to assess which technique should be applied in reallistic situations.

Course content

In the study of protocols, we start with application level protocols enabling the student to start with more familiar paradigms in the context of applications that we use regularly. Moving to lower layers later in the course, we have the possibility to gradually uncover network services, their functionality and the ease/difficulty for achieving them.

Topics covered include: networking applications and protocol; HTTP, SMTP and DNS. Transport protocols TCP, UDP. Content distribution systems. Performance and congestion control. Internet Protocol ITv4 and addressing. Internet routing, mobile IPTv4. Local area networks LANs, medium access protocols; MAC protocols (IEEE 802.X and others), Ethernet, switches and VLANs. Wireless LAN especially Wifi, Access Points, bridges and physical media. Detection and correction of bit errors. Multimedia applications and network security.

Sub-courses

1. **Written exam** *(Tentamen),* 5.5 higher education credits
   Grading scale: Pass with Distinction (VG), Pass (G) and Fail (U)
2. **Laboratory work** *(Laboration),* 2 higher education credits
   Grading scale: Pass (G) and Fail (U)

Form of teaching

Lectures, exercise sessions, home assignment and laboratory work.

The course is given twice a year. Once in English and once in Swedish.

Assessment

The course is examined by home assignments and laboratory work (2.0 hec in total) done in groups of normally 2 students, and an individual written exam (5.5 hec) carried out in an examination hall.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

In cases where a course has been discontinued or has undergone major changes, the student shall normally be guaranteed at least three examination occasions (including the ordinary examination) during a period of at least one year from the last time the course was given.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
To be awarded the grade Pass (G) for the course, the student must pass both the exam and the laboratory part with the grade (G). To be awarded Pass with distinction, (VG) the student must receive a VG for the exam and get the grade G for the laboratory part.

Course evaluation

The course is evaluated through meetings both during and after the course between teachers and student representatives. Further, an anonymous questionnaire is used to ensure written information. The outcome of the evaluations serves to improve the course by indicating which parts could be added, improved, changed or removed.

Additional information

The course is a joint course together with Chalmers.

Course literature to be announced the latest 8 weeks prior to the start of the course.

The course replaces the DIT420 Computer communication 7.5 hec course. The course cannot be included in a degree which contains DIT420. Neither can the course be included in a degree which is based on another degree in which the course DIT420 is included.