Linnæus University

Course syllabus

Faculty of Technology

Department of Computer Science and Media Technology

1DV701 Datornät - introduktion, 7.5 credits
Computer Networks - an introduction

Main field of study
Computer Science

Subject Group
Informatics/Computer and Systems Sciences

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved 2015-05-22
Revised 2022-02-21 by Faculty of Technology. Rephrasing of the prerequisites.
The course syllabus is valid from autumn semester 2022

Prerequisites
30 credits in Computer Science, including Operating Systems (1DV512) 7.5 credits
and
Introduction to programming (1DV501), 7.5 credits or Problem Solving and
Programming (1DV506) 7.5 credits
and
Objectoriented programming (1DV502), 7.5 credits or Programming and Data
Structures (1DV507) 7.5 credits

Objectives

Upon completion of the course the student should be able to:
1. Knowledge and understanding

- Describe the layers in a networking stack, e.g., TCP/IP and discuss their purpose,
- describe how the layers interact to transmit data over a network, and how each function manipulate the data, e.g., by adding headers or convert the signal,
- explain how routing works in local and wide area networks,
- describe the different types of addresses used, and
- describe some of the common application protocols, e.g., DNS.

2. Skills and abilities

- Use common networking debug utilities, e.g., tcpdump, ping, and traceroute,
- write programs in a programming language that communicate over TCP/IP, and
- configure and manage routers according to a specification.

3. Judgement and approach

- Review Internet protocol specifications (RFCs) and implement these in software, and
- given an application and suggestion of implementation (protocol) reason about its properties. These include performance and what problems may occur e.g. with reliability.

Content
The purpose of the course is to give theoretical knowledge about data communication and computer networks as well as practical skills in network programming.
The course covers:

- Layered protocol models, OSI and TCP/IP.
- Packet switching
- Physical data communication.
- Data link protocols.
- Local networks (e.g., topology, access control, IEEE 802 standards).
- Transport protocols
- Application protocols
- Network programming APIs (e.g., BSD Socket)
- Routing

Type of Instruction
Teaching consists of lectures, seminars and practicals. Practicals are individual or carried out in groups.

Examination
The course is assessed with the grades A, B, C, D, E, Fx or F.

Assessment of the student's performance is made through written examination and laboratory assignments. To pass the course you need to get at least grade E on each part of the course. The final grade is a weighted grade between exam (60%) and assignments (40%).

- Computer Networks - An Introduction, Lab, 3 credits
- Computer Networks - An Introduction, exam, 4.5 credits

Repeat examination is offered in accordance with Local regulations for courses and examination at the first and second-cycle level at Linnaeus University.

If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customised exam or to have the student conduct the exam in an alternative way.

Course Evaluation
During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of

the course. The course evaluation is to be carried out anonymously.

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material

Required reading

Comer Douglas, *Computer Networks and Internets*, latest edition

DM, *Distributed material*. Pages 50 (50).