



Course syllabus

Faculty of Technology

Department of Physics and Electrical Engineering

1ED044 Introduktion till tele- och datakommunikation, 7,5 högskolepoäng

1ED044 Introduction to tele and data communications, 7.5 credits

Main field of study

Electrical Engineering

Subject Group

Electrical Engineering

Level of classification

First Level

Progression

G1F

Date of Ratification

Approved 2013-08-19

Revised 2017-11-13 by Faculty of Technology. Removal of ECTS-grading scale.

The course syllabus is valid from spring semester 2018

Prerequisites

Electronics 7.5 credits (1ED041) or the equivalent.

Objectives

The course gives an introduction to the large field of tele- and data communications. By combining previously acquired knowledge of primarily mathematics and electronics the student is expected to understand how these subjects are combined in the description of a large system.

After completing the course, students should be able to describe:

- fundamental principles of radio communication and modulation
- basic principles of data communication
- different techniques for LAN, local area network or WAN, wide area network, and different variants of Ethernet
- OSI reference model with 7 layers and the corresponding TCP / IP model with 5 layers
- principles and functioning of the main protocols in TCP/IP stack, layer 1 - 4.
- describe the principles for error detection and make calculations with CRC, Cyclic Redundancy Check

- perform calculations with Nyquist formula and Shannon's formula for transmission
- do subnet dividing of IP networks with classfull addressing and classless addressing

Content

The course comprises the following topics:

- Introduction to Fourier series and spectra
- Amplitude modulation
- Frequency and phase modulation
- Basic principles of data communications
- Different technologies for LANs, Local Area Networks and WANs, Wide Area Networks
- Different variants of Ethernet in the LAN and WAN
- OSI reference model with 7 layers and the corresponding TCP/IP model with 5 layers
- Function and principles of various protocols in layers 1-4

Type of Instruction

Lectures, tutorials and mandatory laboratory sessions.

Examination

The course is assessed with the grades U, 3, 4 or 5.

Assessment is done through practicals and a written exam.

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Required Reading and Additional Study Material

Required reading

Svärdström A., Modulation och teleteknik, 2nd Ed., Studentlitteratur, 1996. Pages 120 (400)

Behrouz A Forouzan, Data Communications and Networking, Global Edition, 5th edition, McGraw-Hill Higher Education, 2012. Pages 400 (1156)