HE1037 Data- and Telecommunication 10.0 credits

Data- och telekommunikation

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for HE1037 valid from Autumn 2019

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

To take the course the student need basic knowledge of mathematics, circuit theory and electronics.

Language of instruction

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

Intended learning outcomes

To provide fundamental knowledge about the process of electronic communication

After passing the course you should be able to

• Explain important concepts and terminology within the communication field

• Describe the basic components in a communication system

• Analyse signals in the domain of time and frequency

• Explain the difference between digital and analogue signals and the coversion between them

• Describe the fundamentals for TCP/IP-based communicationfunction

• Calculate the data rate in a data channel

• Describe analogue and digital methods of modulation

• Apply the theory about coding and modulation in a communication system

• Describe in what way noise, damping and interference influence the signal in a transmission media

• Describe the appearance of electromagnetic waves and perform a link budget calculation

• Discuss and compare different ways of sollving particular problems in the communication process

Course contents

• Signals in the domain of time and frequency

• Fourier series

•Influence on the signal:

network for limitation of bandwidth, damping, sampling and PCM converting

• Analogue and digital modulation.

• Data transmission: Bandwidth, media of transmission.

• Data rate versus modulation rate and bandwidth versus pulse width.

• Transmission systems: cables (forward and reflected power)

• Antennas and wave propagation

• Equipments in and functions of computer networks.

• The function of protocols in local networks

• Applications: wired and wireless communication systems

Course literature

Wallander, Per, 17 lektioner i TELEKOMMUNIKATION, Perant AB, ISBN 91-86296-10-8

Maria Kihl & Jens A Andersson, Datakommunikation och nätverk. Studentlitteratur ISBN: 978-91-44-08306-3

Examination

- TEN2 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- NÄR1 - Attendance, 1.0 credits, grading scale: P, F
- LAB1 - Lab 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.

If the course is discontinued, students may request to be examined during the following two academic years.

To get the lower grades the student kust be able to describe och perform calculations on individual systems using a handbook.

To get the higher grades a deeper understanding for the connection between the different functions and properties is required.

The final grade is based mainly on the written exams. Grading A-F.

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.