



IK1330 Wireless Systems 7.5 credits

Trådlösa system

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

Establishment

Course syllabus for IK1330 valid from Autumn 2008

Grading scale

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

Education cycle

First cycle

Main field of study

Electrical Engineering, Technology

Specific prerequisites

Completed upper secondary education including documented proficiency in Swedish corresponding to Swedish B and English corresponding to English A. For students who received/will receive their final school grades after 31 December 2009, there is an additional entry requirement for mathematics as follows: documented proficiency in mathematics corresponding to Mathematics A. And the specific requirements of mathematics, physics and chemistry corresponding to Mathematics D, Physics B and Chemistry A.

30 HEC in mathematics

Language of instruction

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

Intended learning outcomes

The student should after the course be able to

- **describe relationship between data rate, bandwidth and channel capacity - describe the principle of multiplexing in the frequency and time plane - explain the way data is transmitted in circuit switching and packet switching networks**
- **describe common types of antennas- calculate the attenuation of radio waves in free space from frequency, antenna gain and distance - explain why the free space model is invalid in multi path propagation- explain different principles of modulation ASK, FSK, BPSK, QPSK**
- explain techniques of spread spectrum FHSS, DSSS and techniques for multiple access CDMA
- describe codes for error correction and error detection
- **calculate simple checksums**
- describe the architecture of cellular mobile networks
- describe the architecture, services, medium access control (MAC) and MAC frames and physical layer of 802.11 WLAN standard
- describe the architecture, protocol and radio specification of personal area networks (PAN) according to the standard 802.15 (Bluetooth, ZigBee)

Course contents

Channel capacity, transmission, multiplexing OSI-model Antennas, wave propagation, fading Modulation ASK, FSK, BPSK, QPSK Spread spectrum FHSS, DSSS Multiple access FDMA, TDMA, CDMA Error detection and error correction Wireless networks using standard 802.11 WLAN, 802.15 Bluetooth, ZigBee

Course literature

Wireless Communications & Networks, Stallings, William Edition: 2nd, Publisher: Prentice Hall År: ISBN: 0-13-196790-8

Examination

- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory 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.

_Laboratory assignments 3,0 hp

_Written exam 4,5 hp

Other requirements for final grade

Passed examination (TEN1; 4,5 HEC credits).

Passed laboratory work (LAB1; 3 HEC credits).

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.