IK1330 Wireless Systems 7.5 credits

Trådlösa system

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

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

Establishment

Course syllabus for IK1330 valid from Spring 2013

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

15 HEC in communication systems

Language of instruction

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

Intended learning outcomes

This course providesan overviewofwireless systems.It describes the basicdesign ofradio links andradio networks, and describes thesystem architectureand function of differentexisting standardsfor wireless systems.
To pass, the student should be able to:
Give an overview how a fading radio channel affects the link performance of wireless communication systems.
Dimensioning a radio link in terms of range and channel capacity based on given conditions
Explain how multiple access methods works.
Calculate the capacity of radio networks using simple models
Give an overview of the system architecture of the various existing wireless communication systems.

For the highest grade, the student should be able to:
Explain wavepropagation mechanisms and make judgments based on how these mechanisms affect the wave propagation.
Solve a general design problem for the radio links and radio networks by using simple formulas
Given an overview of various existing systems for wireless communications and compare the capacity and performance of them.
Fullfilling partsof the learning outcomes ofthe highest graderesults ingradesDto B.

Course contents

Channel capacity, transmission, multplexing,Antennas, wave propagation, fading, Digital Modulation, Spread spectrum FHSS, DSSS, Multiple accesss FDMA, TDMA, CDMA, OFDMA, Error detection and error correction, Wireless networks using standards for cellular mobile broadband systems, wireless LAN, sensornetworks and PAN.

Course literature

Wireless Communications & Networks, Stallings, William Upplaga: 2:a, Förlag: Prentice Hall År: ISBN: 0-13-196790-8

Examination

- INL1 - Problem Assignments, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LABA - Laborative Work, 1.5 credits, grading scale: P, F
- SEM1 - Seminars, 1.5 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.

Laboratory assignments 3,0 hp
Written exam 4,5 hp

Other requirements for final grade

Passed Seminars (TEN1; 1,5 HEC credits).
Passed laboratory work (LAB1; 1,5 HEC credits).

Passed Problem assignments (INL1: 4,5 HEC).

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.