EP2950 Wireless Networks 7.5 credits

Trådlösa nätverk

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

Establishment

Course syllabus for EP2950 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Language of instruction

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

Intended learning outcomes

After passing the course the student shall

- have a basic knowledge about radiation properties for common types of antennas.
- explain the physics behind wave propagation problems, like shadow fading, Rayleigh fading and inter symbol interference and predict how different modulation techniques deal with these problems
- calculate maximum range in a radio transmission channel under given circumstances
- explain how the carrier is modulated and give a figure on modulation symbol rate and expected effective information bit rate for some mobile and WLAN standards
- perform convolution coding from the trellis diagram,
- perform block coding and cyclic code for error recovery and error correction
- explain interleaving, and why frequency hopping is essential to make convolution coding effective
- explain the architecture and services in IEEE 802.11
- explain properties in different WLAN access points.
- perform site planning and project management for a WLAN
- explain the protocol architecture in IEEE 802.15
- explain the specification for baseband and radio layer in IEEE 802.15
- explain cell planning in GSM and UMTS networks
- explain how connections are set up to or from the cellular phone and what happens in the different steps of connection establishement.

Course contents

The course should give understanding in principles and system solutions for data communication in wireless networks and covers

- antenna and wave propagation
- modulation techniques, especially OFDM
- convolutional codes and block codes
- cellular mobile phone systems
- the WLAN technologies IEEE 802.11 and 802.15

Course literature

William Stallings: Wireless communications and networks, second edition.

Examination

- PRO1 - Project, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, 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.

Other requirements for final grade

Written exam (TEN1, 4,5p), grades A/B/C/D/E/Fx/F.
Lab assignment (LAB1 3p), grades Pass/Fail.

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.