



FIK3505 Wireless Access Protocols 7.5 credits

Trådlösa accessprotokoll

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

Establishment

Course syllabus for FIK3505 valid from Spring 2017

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Language of instruction

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

Intended learning outcomes

The course aims at providing the students the fundamentals of packet oriented wireless communication systems. After successful completion of the course the student should be able to perform performance analysis of media access protocols, in particular in wireless systems

with analytic and simulation tools. Specific emphasis is on radio layer aspects as fading, interference and power capture phenomena are treated.

Course contents

- 1) Wireless packet transmission: Fading channels, ARQ, HARQ, Energy efficient protocols, Link adaption & scheduling, Throughput/Delay tradeoff.
- 2) Multiple access protocols: Introduction, Models & Classification
- 3) Conflict free access schemes, FDMA/TDMA-systems, Generalized TDMA, Dynamic conflict free access: Reservation schemes, Polling. Bluetooth.
- 4) ALOHA-type Protocols: Pure & slotted Aloha. Finite & infinite user populations. Delay & Stability analysis. Impact of radio channels (errors, fading, capture). Multiple access in cellular systems.
- 5) Carrier Sense type Protocols: Persistence, slotted/pure CSMA. CSMA/CD. Hidden terminals. IEEE 802.11xx, WiFi
- 6) Collision Resolution Protocols: Tree & stack protocols, limited sensing.
- 7) Multihop radio networks: multiple access in multihop systems. STDMA, Multihop CSMA. Multihop routing schemes.
- 8) Course project - Performance evaluation of radio-access protocols by simulation

Disposition

Seminars, Homework review sessions, Project

Course literature

R Rom M Sidi, Multiple Access Protocols, Springer 1991
Journal Articles

Examination

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

Homework problems -75% solved satisfactory
Project: Written report + oral presentation

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.