IL2219 Radio Electronics 7.5 credits

Radioelektronik

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

Establishment

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Knowledge in analogue electronics, 6 higher education credits, equivalent to completed course in IE1202/IE1207.

Intended learning outcomes

After passing the course, the student shall be able to

- give an account of modern radio implementations with an emphasis on radio components, radio circuits, radio systems, and special building blocks appropriate for integration on chip

in order to be prepared for degree projects in the field and furthermore industrial or academic careers.

Course contents

The course starts with an introduction to radio electronics and continues with basic concept as noise, non-linearity, sensitivity, etc. Then, modulation and access-methods are discussed and be given an overview of industrial standards of today. Different receiver-architectures that the heterodyne, the homodyne, image-reject, digital-IF, and subsampling be gone through and also transmitter architecture. Furthermore, the course explains certain passive circuits, transmission lines, S-parameters, Smith charts. Building blocks appropriate for radiocircuits are discussed. Low noise amplifiers and mixers in both CMOS and bipolar design. Here, adaptation and noise characteristics are also discussed. Oscillators with phase noise, pulling and injection-lock are explained as well as synthesizers with different phase-lock structure. The course is completed with power amplifier and linearisations techniques.

Examination

- TEN1 - Examination, 6.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Course, 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.

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

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.