

Radio Frequency Transceiver Design

Konstruktion av radiotransceivers
6 credits

Programme course

TSEK38

Valid from: 2023 Spring semester

Determined by	Main field of study	
Board of Studies for Electrical Engineering, Physics and Mathematics	Electrical Engineering	
Date determined	Course level	Progressive specialisation
2022-08-31	Second cycle	A1X
Revised by	Disciplinary domain	
	Technology	
Revision date	Subject group	
	Electrical Engineering	
Offered first time	Offered for the last time	
Autumn semester 2011		
Department	Replaced by	
Institutionen för systemteknik		

Course offered for

- Master of Science in Computer Science and Engineering
- Master of Science in Applied Physics and Electrical Engineering
- Master of Science in Applied Physics and Electrical Engineering - International
- Master's Programme in Electronics Engineering

Prerequisites

Background in RF electronics, integrated circuits and communication theory.

Intended learning outcomes

The course gives students practical knowledge of the system design of radio frequency circuits for wireless communication. Students learn systematic design methods for recipients and transmitters used in wireless communication systems, such as 3G, 4G, WLAN and Bluetooth. Several aspects at the system level are presented, which requires basic knowledge of radioelectronics circuits. The aim of the course is that the student should learn the design principles of radio frequency systems for current radio standards and existing physical constraints. After the end of the course, the student is expected to:

- analyze radio system and its physical layer (PHY) given specifications from different radio standards,
- transform the system specification to performance requirements for radio circuits for different architectures,
- verify an RF front-end for the required performance using professional software tools

Course content

Basic radio system design and design trade-offs for various radio architectures. Analysis and design of receiver and transmitter systems. Radio circuits and baseband issues. Performance evaluation. Project and design work with professional tools.

Teaching and working methods

Lectures, laboratory work, seminars, and project assignment.

Examination

LAB1	Laboratory work	2 credits	U, G
PRA1	Project Work	4 credits	U, G

Grades are given as "Fail" or "Pass".

Grades

Two grade scale, older version, U, G

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is "Swedish", the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is "English", the course as a whole is taught in English. Examination language is English.
- If teaching language is "Swedish/English", the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

The course is campus-based at the location specified for the course, unless otherwise stated under "Teaching and working methods". Please note, in a campus-based course occasional remote sessions could be included.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.