

## Radio Frequency Transceiver Design

Konstruktion av radiotransceivers  
6 credits

Programme course

TSEK38

Valid from: 2022 Spring semester

<b>Determined by</b>	<b>Main field of study</b>	
Board of Studies for Electrical Engineering, Physics and Mathematics	Electrical Engineering	
<b>Date determined</b>	<b>Course level</b>	<b>Progressive specialisation</b>
2021-09-01	Second cycle	A1X
<b>Revised by</b>	<b>Disciplinary domain</b>	
	Technology	
<b>Revision date</b>	<b>Subject group</b>	
	Electrical Engineering	
<b>Offered first time</b>	<b>Offered for the last time</b>	
Autumn semester 2011		
<b>Department</b>	<b>Replaced by</b>	
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.

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](http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva).