

# Wireless Communication Systems

Programme course

6 credits

Trådlösa kommunikationssystem

TNK080

Valid from: 2017 Spring semester

**Determined by**

Board of Studies for Industrial  
Engineering and Logistics

**Date determined**

2017-01-25

**Offered for the last time**

Spring semester 2018

## Main field of study

Electrical Engineering

## Course level

Second cycle

## Advancement level

A1X

## Course offered for

- Intelligent Transport Systems and Logistics, Master's programme
- Electronics Design Engineering, M Sc in Engineering
- Communication and Transportation Engineering, M Sc in Engineering

## Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

## Prerequisites

Telecommunication or Mobile Communication

## Intended learning outcomes

The course intends to provide knowledge in the area of wireless communication. The aim is to

- introduce the concept of wireless communication
- understand problems specific for wireless communication and technical solutions
- understand design, construction and evaluation of wireless systems using radio communication.
- give an overview on some existing systems

## Course content

Basics about radio communication system: frequency spectrum and its properties, frequency bands, overview on various radio systems. Signal propagation in free space, antennas. Stochastic channel models: fading and shadowing. Data transmission over radio channels: modulation schemes, transmission over fading channels. Diversity methods. Coding methods: block codes and convolutional codes, coding gain. Multiple access. Spread-spectrum, OFDMA. Standards and technology: Cellular Systems, Machine-to-Machine/Ad-Hoc networks.

## Teaching and working methods

The course consists of lectures and tutorials.

## Examination

UPG1	Project	1.5 credits	U, G
TEN1	Examination	4.5 credits	U, 3, 4, 5

## Grades

Four-grade scale, LiU, U, 3, 4, 5

## Other information

*Supplementary courses:*

Network simulation.

## Department

Institutionen för teknik och naturvetenskap

## Director of Studies or equivalent

Erik Bergfeldt

## Examiner

Evangelos Angelakis

## Education components

Preliminary scheduled hours: 50 h

Recommended self-study hours: 110 h

## Course literature

A. Goldsmith, Wireless Communications, Cambridge University Press, 2005.

## 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).