

# Mobile Communication and Networks

Programme course

6 credits

Mobil kommunikation och nätverk

TNK110

Valid from: 2017 Spring semester

**Determined by**

Board of Studies for Industrial  
Engineering and Logistics

**Date determined**

2017-01-25

## Main field of study

Electrical Engineering, Transportation Systems Engineering

## Course level

Second cycle

## Advancement level

A1X

## Course offered for

- Intelligent Transport Systems and Logistics, Master's programme

## 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

Basic courses in programming and statistics as well as basic course in computer networking and/or telecommunication.

## Intended learning outcomes

The course aims to provide knowledge in mobile communications, especially different system characteristics, modeling and performance. The students should after completing the course be able to:

- Identify the most important components and functions of a mobile communication system
- Explain the differences in characteristics between different types of mobile communication systems and motivate their existence
- Compare and explain areas of applications for different mobile communication systems
- Relate functions, terms and technologies to the correct level in a communication system architecture
- Argue for the role of the mobile communication systems in different applications
- Evaluate trade-offs between different mobile communication technologies and systems
- Define and calculate key performance metrics of a mobile communication system
- Assess the performance of different mobile communication technologies given a set of application requirements
- Apply models and methods for planning of cellular networks
- Quantitatively model and evaluate selected parts of a mobile communication system
- Apply previous knowledge from statistics, modeling, programming and data/telecommunications in the area of mobile communications
- Independently plan, perform and document a research oriented project in the area of mobile communications

## Course content

Overview of modulation, channel coding, and medium access control for mobile networks. Performance metrics and trade-offs. Models for capacity, mobility and radio resource management. Network planning and dimensioning. Specific systems, such as WiFi, GPRS, and HSDPA.

## Teaching and working methods

Lectures, tutorials and smaller project assignment.  
The course runs over the entire spring semester.

## Examination

LAB1	Laboratory work	1 credits	U, G
UPG1	Project Work	2 credits	U, G
TEN2	Written examination	3 credits	U, 3, 4, 5

## Grades

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

## Other information

*Supplementary courses:*

Wireless Communication Systems, Network Simulation, Positioning Systems

## Department

Institutionen för teknik och naturvetenskap

## Director of Studies or equivalent

Erik Bergfeldt

## Examiner

David Gundlegård

## Education components

Preliminary scheduled hours: 48 h

Recommended self-study hours: 112 h

## Course literature

Vijay Garg, Wireless Communications and Networking, Elsevier, 2007, ISBN 978-0-12-373580-5

## 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).