

COM-304

**Communications project**

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Cursus	Sem.	Type
Communication systems	BA6	Opt.
Computer science	BA6	Opt.

Language of teaching	English
Credits	8
Withdrawal Session	Unauthorized Summer
Semester	Spring
Exam	During the semester
Workload	240h
Weeks	14
<b>Hours</b>	<b>12 weekly</b>
Lecture	2 weekly
Project	10 weekly

**Number of positions**

**It is not allowed to withdraw from this subject after the registration deadline.**

**Summary**

The course teaches the development of systems that solve real world challenges in the areas of communications, signal processing, data science, and AI. Students will work in teams, construct their ideas and either program available hardware prototypes or build their own hardware.

**Content**

The course will teach students both technical and project management skills which are essential in developing, designing, and prototyping practical systems where the underlying challenges fall in on or multiple areas with a focus on communication, signal processing, data science, and artificial intelligence.

A substantial emphasis will be put on the programming of software defined radios, radars, sensors, cameras, LiDARs, various robots as well as real-time data extraction and processing using techniques in digital communication, signal processing and machine learning.

The course will provide tutorials on essential technical information needed for the projects as well as quick guides for using the different hardware prototypes provided by the instructors. Students will individually be evaluated on using one of the hardware prototypes relevant to their project. Students will then team up to propose, design, and build their own projects.

**Learning Prerequisites****Required courses**

COM-202 Signal Processing (BA3)  
CS-233 Introduction to Machine Learning (BA4)

**Recommended courses**

COM-302 Principles of Digital Communications (BA6) (To be taken concurrently)  
COM-208 Computer Networks (BA3)  
CS-202 Computer System (BA4)  
COM-102 Advanced Information, Computation, Communications II (BA2)

**Important concepts to start the course**

Basic programming skills.

**Teaching methods**

- Video lecture on background material.
- Tutorials on the hardware prototypes.
- Continuous supervision and tutoring
- Extensive team work and team feedback

### Expected student activities

- Take an entrepreneurial approach to create and develop a practical system under the given hardware constraints.
- Work with team members to complete a large practical project
- Independently research solutions, learn new concepts and apply them in practice.
- Debug software/hardware systems.
- Discuss project progress in class
- Provide constructive criticism and feedback to other groups
- Present project outcome in a public forum

### Assessment methods

35% Individual activities grade

65% Team project grade

### Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes