



## COURSE SYLLABUS **Intelligent Mobile Systems, 7.5 credits**

*Intelligenta mobila system, 7,5 högskolepoäng*

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<b>Course Code:</b> TIGN13	<b>Education Cycle:</b> First-cycle level
<b>Confirmed by:</b> Dean Oct 15, 2022	<b>Disciplinary domain:</b> Technology
<b>Valid From:</b> Jan 1, 2023	<b>Subject group:</b> DT1
<b>Version:</b> 1	<b>Specialised in:</b> G2F
	<b>Main field of study:</b> Computer Engineering

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### **Intended Learning Outcomes (ILO)**

After a successful course, the student shall

Knowledge and understanding

- show familiarity with basic principles for data transmission (e.g. bandwidth, modulation and choosing antennas)
- display knowledge of interfaces, protocols, and standards for wireless and wired communication between nodes within a distributed system
- show familiarity with different positioning methods- and services which have different suitable application areas

Skills and abilities

- demonstrate the ability to, as a participant in a project group, be able to contribute to the development process from idea to a realized product including stable and maintainable code
- demonstrate the ability to implement a complete system that is incorporating sensors, communication, back-end and a user interface

Judgement and approach

- demonstrate the ability to evaluate how different sensors and data processing algorithms can be used to contribute to autonomy and intelligence in mobile systems
- demonstrate the ability to outline an appropriate architecture and interface for a distributed system that interacts with users and the environment
- demonstrate the ability to evaluate the pros and cons of different development environments and other IT artifacts to select appropriate tools in a specific project.

### **Contents**

The course conveys the knowledge in data communication, localization, sensors, and cloud services needed to build a mobile system where some intelligence is present in the front- or back-end. Students are also given the opportunity to apply the knowledge they gained earlier in the program, both technical and development methodologies, to develop a qualified product or service.

The course includes the following elements:

- Antennas, modulation, bandwidth
- Bluetooth, Wi-Fi, LoRa, Zigbee,
- CAN, Ethernet
- Localization services (GNSS, etc.)
- Sensors for intelligent systems (vision, ToF, etc.)
- Cloud services for mobile systems
- User interface for intelligent products
- Project methodology

### **Type of instruction**

Lectures and project work.

The teaching is conducted in English.

### **Prerequisites**

General entry requirements and completed courses 60 credits in first cycle, including Object-oriented Software Development 6 credits alternatively Object-oriented Software Development with Design Patterns 6 credits and Android Development 7,5 credits and Software Engineering Project Methods 7,5 credits (or the equivalent).

### **Examination and grades**

The course is graded 5,4,3 or Fail.

Registration of examination:

Name of the Test	Value	Grading
Exam	3 credits	U/G
Project <sup>1</sup>	4.5 credits	5/4/3/U

<sup>1</sup> Determines the final grade of the course, which is issued only when all course units have been passed.

### **Course literature**

Literature

The literature list for the course will be provided 8 weeks before the course starts.

No specific course material in advance but provided during the course.