IK1332 Internet of Things 7.5 credits

Sakernas internet

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Grading scale

A, B, C, D, E, FX, F

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Knowledge in computer networks, 6 credits, equivalent to completed course EP1100/IK1203/IK2218/EP2120.

Knowledge and skills in programming, 6 credits, equivalent to completed course DD1337/DD1310-DD1319/DD1321/DD1331/DD1333/DD100N/ID1018/ID1022

Intended learning outcomes

After passing the course, the student should be able to

- describe at a general level the system architecture for various existing technologies for the Internet of Things (IoT)
- describe communication protocols related to IoT, machine to machine communication (M2M) and communication with sensors and actuators
- configure and design IoT services with existing technologies
- describe and implement simpler methods for local sensor data processing on IoT devices, including the use of ready-made simple machine learning models
- explain challenges regarding sustainability, security, privacy and ethics for IoT technology from a broad perspective.

For higher grades, the student should also be able to

- analyse and compare different IoT architectures and communication protocols based on performance, security and energy efficiency
- motivate the choice of technologies and design decisions when designing IoT systems for different applications
- adapt and optimise methods for local data processing and machine learning on IoT devices for specific needs
- analyse IoT systems with respect to sustainability, security, integrity and ethics.

Course contents

- Infrastructure, system architectures and communication protocols for IoT.
- Operating systems and programming environments for embedded devices, such as Linux and FreeRTOS.
- Protocols for transferring sensor data, such as MQTT and CoAP.
- Protocols for communication between IoT processors, sensors and actuators, such as I2C and SPI.
- Sensor data processing and machine learning on IoT devices.
- Application areas and associated system requirements.
- Sustainability, security, privacy, energy, and ethics of IoT systems.

Examination

- LABA - Laborative Work, 3.0 credits, grading scale: P, F
- PROA - Project Work, 3.0 credits, grading scale: P, F
- TENA - Written Exam, 1.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.