Internet of Things

Sakernas internet
6 credits

Programme course

TNK116

Valid from: 2026 Spring semester

Determined by	**Main field of study**	
Board of Studies for Industrial Engineering and Logistics	Electrical Engineering, Transportation Systems Engineering	
Date determined	**Course level**	**Progressive specialisation**
2025-08-28	Second cycle	A1N
Revised by	**Disciplinary domain**	
	Technology	
Revision date	**Subject group**	
	Other Subjects within Technology	
Offered first time	**Offered for the last time**	
Spring semester 2019		
Department	**Replaced by**	
Institutionen för teknik och naturvetenskap		

Course offered for

- Master of Science in Electronics Design Engineering
- Master of Science in Communications, Transport and Infrastructure
- Master's Programme in Intelligent Transport Systems and Logistics

Prerequisites

The course labs and project will deal with IoT devices programming, thus programming/developing skills (especially in C/Java) are necessary.

Intended learning outcomes

After the course the student should be able to:

- Discuss major machine-to-machine (M2M) communication characteristics and analyse them
- Identify and analyse the requirements for network layer support for an Internet of Things (IoT) infrastructure
- Design solutions for integrating smart objects into IoT frameworks
- Design IoT architectures and services
- Evaluate the performance of IoT systems based on identified key performance indicators

Course content

This course introduces the design principles of the Internet of Things (IoT), their device and infrastructure-related architectures, technologies and protocol frameworks towards enabling the formation of highly distributed and ubiquitous networks with seamlessly connected heterogeneous objects. The student will learn to design and analyze such networks and architectures to support the development of intelligent services, with different performance requirements, in a variety of application domains.

Specifically, students will be exposed to architectures and methodological paradigms for the Internet of Things, and protocols at the different levels of the IoT stack. They will also learn to map those concepts on an access layer (including sensor, vehicular and cellular networks for machine-to-machine communication) and network layer (with particular emphasis on IPv6-based solutions), and analyze their performance. The course will also introduce technologies and protocols at the service and application layers, which enable the integration of embedded devices in web-based, distributed applications.

Teaching and working methods

The course comprises lectures, programming assignments, and an implementation project.

Examination

LAB1	Laboratory Work	4 credits	U, 3, 4, 5
UPG1	Assignments	2 credits	U, 3, 4, 5

The final grade is weighted by the distribution of credits of the partial examinations.

Grades for examination modules are decided in accordance with the assessment criteria presented at the start of the course.

Grades

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

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

The course is campus-based at the location specified for the course, unless otherwise stated under “Teaching and working methods”. Please note, in a campus-based course occasional remote sessions could be included.