IoT-based industrial automation and digitalization 7.5 credits D7042E

IoT-baserad industriell automation och digitalisering

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2022-02-11

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IoT-baserad industriell automation och digitalisering

Second cycle, D7042E

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Elektroteknik	Electrical Engineering

Entry requirements

Programming skills and basic knowledge in computer communbications, corresponding courses D0009E - Introduction to Programming 7.5 hp, D0010E - Object-oriented Programming and Design 7.5 hp, D0002E - Computer Communications 7.5 hp, D0020E - Project in Computer Science and engineering 15.0 hp, D0029E - Computer and network security 7.5 hp and D7032E - Software engineering 7.5 hp.

Good knowledge in English equivalent to English 6.

Selection

The selection is based on 30-285 credits

Course Aim

The aim of the course is for the student to acquire basic knowledge of IoT-based automation and Arrowhead Framework with regard to its properties and core systems, and the ability to design and implement Arrowhead Framework capable services and applications.

After passing the course, the student should be able to:

- Explain what automation and digitization with IoT and systems of systems means, and how Arrowhead Framework architecture and concepts such as local automation clouds and service-oriented design can be used.
- Install and use Arrowhead Framework reference implementation including its core system to design and deploy Arrowhead Framework compatible services and applications.
- Document Arrowhead Framework systems of systems according to its documentation model.

Acquired knowledge is shown at the oral exam and with presentation and demonstration of a project assignment and submission of working code and associated documentation. The project assignment includes design, implementation and documentation of an automation function that is created with the help of Arrowhead Framework reference implementation.

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Contents

The course covers advanced industrial automation based on the Internet of Things (IoT), Service-Oriented Architecture (SoA) and Systems of Systems engineering and design. This is based on the Arrowhead Framework, which is a framework with a reference implementation for the 4th generation industrial systems.

Arrowhead Framework reference implementation is used in the course's laboratory part to design, implement and document an automation function such as making available sensor data as a service that can be consumed by various automation functions.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
The course is conducted as a distance course using the Internet, lecture room attendance is also possible and contains no mandatory gatherings. The student will get an individual mandatory assignment. During the course, the student participates in lectures and workshops together with other students and a individual assignment.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Acquired knowledge is presented during an oral examination such as presentation and demonstration of project assignment as well as submission of code and documentation.

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Oral examination	G U 3 4 5	7.5	Mandatory	A21	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

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Last revised

by Jonny Johansson, HUL SRT 2022-02-11

Syllabus established

by Jonny Johansson, HUL SRT 2018-02-15

Document	Education		Admitted in	Date	Page
Syllabus	IoT-based industrial automation and digitalization 7.5 cr		Autumn 2023, Sp 1	2022-02-11	4 (4)

Utskriftsdatum: 2024-04-30 07:51:46

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