

SYLLABUS

Software Design for Industry Automation 2.5 credits Z7004E

Mjukvarudesign för industriell automation

Course syllabus admitted: Spring 2021 Sp 3 - Present

**DECISION DATE
2021-06-03**

Software Design for Industry Automation 2.5 credits Z7004E

Mjukvarudesign för industriell automation

Second cycle, Z7004E

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	U G#	Datalogi	Computer Technology

Entry requirements

Before enrolling in this course, students should have basic understanding of:

Boolean algebra. Course M0009M Discrete Mathematics.

Basic concepts of computer networking. Course D0002E Computer communications or equivalent.

The knowledge of basic industrial automation concepts, such as programmable logic controllers (PLC) and their programming, is beneficial.

Alternative:

Alternative to completed course can be corresponding knowledge acquired through work within the industrial sector.

Selection

Examiner

Sandeep Patil

Course Aim

After completing the course, the student shall be able to:

- Identify the challenges in the design and development of software for industrial automation.
- Identify the role of software in industrial automation.
- Develop simple industrial automation control applications using structured text and ladder logic.
- Design a simple control software using state-machine-based design and implement this design using structure text/Ladder logic.
- Motivate the need for adopting industry 4.0 as the future of industrial automation.

Contents

The contents of this course will cover how industrial automation systems work and the role software plays in factory floor operation.

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 realized by following activities.

- Online (pre-recorded) lectures.
- Offline self-study and research on different topics
- Practical work – programming using CoDeSys software.
- Weekly live meetings - use these meetings to ask questions about the material and/or the practical tasks.

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. There will be three practical tasks that you will work on and submit on the Canvas LMS.

Remarks

Required:

- Personal Computer, you are highly encouraged to use your own personal computer (if available, no need to buy a new one) and not a company-issued computer. Since you will install software, you will need full administrative rights.
- Traditionally for this course, you use a real HW. Due to the remote nature of this course, you will only use simulation.

Literature. Valid from Spring 2021 Sp 3

Title: "Automating Manufacturing Systems with PLCs" Version 5.1 by Hugh Jack.
This book is available for free on <https://archive.org>

The teacher will also provide material.

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Practical assignments	U G#	2.5	Mandatory	S21	

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.

Syllabus established

by Jonny Johansson, HUL SRT 2021-06-03