

SYLLABUS

Simulation - Production, Human and Robot 7.5 credits T0027T

Simulering - Produktion, människa och robot

Course syllabus admitted: Autumn 2023 Sp 1 - Present

**DECISION DATE
2023-02-15**

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Simulering - Produktion, människa och robot

First cycle, T0027T

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Produktionsteknik	Mechanical Engineering

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and and documented skills in English language and Basic knowledge and knowledge about manufacturing systems, automation or system technologie for example E0009N, K0019N, K0020N, T0019T and T0023T.

Selection

The selection is based on 1-165 credits.

Course Aim

1 Knowledge and understanding

- explain industrial robots, manikins, robot- and ergonomic simulation,
- describe the properties and basic structure of discrete event simulation,
- describe how discrete event simulation can be applied for development of production systems,
- describe tools and methods for analyses of results from a simulation study,
- explain theories for automation and ergonomics,
- explain analytical methods for automation and ergonomics,
- reflect over sustainability (equality include) in development of production systems,

2 Skill and Ability

- create 3D models of work cells for robot-and ergonomic simulation,
- program basic kinematics movements for robots, computer manikins and other objects,
- analyse and optimize design of robot and manual workplaces,
- apply discrete event simulation for analyses of production systems,
- plan, interpret, analyse and present results from simulation experiments,

3 Valuation and Attitude

- reflect and value own contributes in laboratory and project work.

Contents

The course deals with production, ergonomic and robot simulation as work tools as well as the structure and industrial application of industrial robots. During the lessons, the advantages of the method and technology as well as its disadvantages are highlighted, as well as steps for successful simulation such as conceptual modeling, input and result analysis and result presentation. Laboratory sessions, assignments and the project work aim to provide practical experience of industrial robots as well as production and robot simulation in the form of model building and analysis of simulation results.

The course concerns the interaction between different kinematics devices in the context of industrial workplaces and manufacturing systems. The course threats both soft and hard factors that is an important prerequisite for a sustainable and effective production system.

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

Lectures, seminars, case studies, laboratory exercises and a group project.

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. In the course, continuous examination is applied with the grading scale U, 3, 4, 5. To pass, approved control writing, approved laboratory sessions, approved seminar assignments, practice assignments and internship cases are required.

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.

Remarks

Good knowledge in English, equivalent to English 6. The course cannot be included in the degree together with T0012T.

Overlap

The course T0027T is equal to T0012T

Course offered by

Department of Engineering Sciences and Mathematics

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Control writing	G U 3 4 5	1	Mandatory	A23	
0002	Exercise	G U 3 4 5	3.5	Mandatory	A23	
0003	Seminars	U G#	1	Mandatory	A23	
0004	Case study	U G#	2	Mandatory	A23	

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 Mats Näsström, Head of Undergraduate Education 2023-02-15