Virtual Manufacturing

Programme course

6 credits

Virtuell produktion

TMPS33

Valid from: 2019 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined
2018-08-31

Offered for the last time
Autumn semester 2024

Replaced by
TMPR07

Main field of study
Product Development, Mechanical Engineering

Course level
Second cycle

Advancement level
A1N

Course offered for
- Master's Programme in Mechanical Engineering
- Mechanical Engineering, B Sc in Engineering
- Design and Product Development, M Sc in Engineering
- Mechanical Engineering, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering
- Industrial Engineering and Management - International, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Basic courses in Production Engineering, Machine Elements and CAD, and Industrial Economics and Management. Knowledge of computerized controlled machines is useful for the course.

Intended learning outcomes

This course covers production simulation as a tool during the development of process layouts, workshop layouts, industrial robot work-cells and work stations and as a tool for verification and visualization in production planning. The focus of the course is the functionality of a simulation system/tool.
The aim of the course is to give basic knowledge so the student can use the department simulation software in the production engineering courses when a project work is carried out. After the course the student should be able to:

- describe the possible use of geometry oriented simulation in the production engineering area.
- describe the functionality of a geometry oriented simulation system for use during production engineering development in the area of robot simulations, assembly simulations and ergonomic simulations.
- to understand and use the technical vocabulary in the technical area.

The student should also be able to:

- use a robot simulation system as an aid during development of industrial robot work-cells and production systems containing products, processes and resources.
- make analysis of robot reach, pose and collision with the aid of a simulation system during production planning work.
- create mechanisms in the simulation system for use in the planning work, for example robot grippers and machine movements.
- create simulation sequences for the simulation of a planned production system.
- create an assembly simulation for a specific product.

Course content

Driving forces for the use of geometry oriented in planning of production system planning. Industrial examples. Simulation of work-cells including industrial robots. The areas of simulation are Assembly simulation, Ergonomic simulation, Simulation of software and its functionality.

Teaching and working methods

The course is given in a one quarter study period. Lectures are given on geometry oriented production simulation, software simulation and its functionality. The lectures are given during the first weeks of the study period. The laboratory exercises will give an insight in one commercial production simulation system. A small project is included in the course to give further training in the simulation work.

Examination

UPG1	Project assignment	1 credits	U, G
LAB1	Laboratory work	2 credits	U, G
TEN1	Written examination	3 credits	U, 3, 4, 5

The written examination will cover the whole course. The material presented in the assignments and in the laboratory work will be examined separately.

Grades

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

Other information

Supplementary courses: Production logistics, Production systems.

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Mats Björkman

Examiner

Martin Hochwallner

Course website and other links

Education components

Preliminary scheduled hours: 82 h
Recommended self-study hours: 78 h

Course literature

Compendia