

Assembly Technology

Programme course

6 credits

Monteringsteknik

TMPS22

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical
Engineering and Design

Date determined
2017-01-25

Main field of study

Mechanical Engineering

Course level

Second cycle

Advancement level

A1X

Course offered for

- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering
- Mechanical Engineering, M Sc in Engineering
- Design and Product Development

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, Electrical Engineering and Industrial Economics and Management.

Intended learning outcomes

The course deals with assembly from both a technical and an organisational point of view, with emphasis on technical matters in the assembly operations. The goal is to give basic knowledge of production technology related to the assembly situation as well as knowledge about different means and methods used in assembly. The knowledge goals are:

The student should be able to:

- - describe how assembly systems can be organized and explain the losses in assembly systems.
- - describe how material supply to assembly system can be organized.
- - describe assembly operation types in the assembly process; the function of the assembly operations, methods, tools and equipment which are used (for joining operations only production engineering aspects).
- - explain the differences between assembly production and part manufacturing (part forming).
- - describe the consequences of the product design for the assembly system build up and for the assembly
- - understand the vocabulary which is used in the technical area assembly.

The proficiency goals are:

The student should be able to:

- - to be able to analyze a product from an assembly technology engineering point of view with an DFA-method.
- - to be able to plan, programme, adjust and run a small robot assembly system for a given product.

Course content

The importance of economy and technology in assembly manufacturing. Production technology and economic prerequisites for automatic as well as manual assembly. Design technical issues related to assembly. Equipment and techniques used for different part operations in assembly. Production philosophy and assembly systems. Industrial robot technology related to flexible automatic assembly. Disassembly.

Teaching and working methods

The course is given in one quarter study period. Lectures are given on assembly process operations, including methods, tools and equipment. The lectures also cover the build up of different assembly systems and their production engineering features. A demonstration of a flexible automatic assembly system is given in connection with the lectures. Classes are used for solving a Design for Assembly (DFA) task. The laboratory exercises are performed to give hands-on experience on basic assembly operations, robot assembly, etc

Examination

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

The written examination covers the whole course. The material presented in the assignments and laboratories tested in the written examination are also examined separately.

The laboratory tasks examine the student capacity to:

- - outgoing from, a product description with its function and a description of a robot assembly system for the product, plan the assembly system sequence of operations, programme, debug and make adjustments and finally run the robot assembly system for the product. The programme developed by the student should show the understanding of security aspects as well as understanding of the importance of an easy restart of the system after stoppage in the assembly process.
- - examine an existing assembly method with respect to weaknesses in the method and in the product design from a production engineering perspective.

Grades

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

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Mats Björkman

Examiner

Luis Ribeiro

Course website and other links

Education components

Preliminary scheduled hours: 50 h

Recommended self-study hours: 110 h

Course literature

Additional literature

Compendia

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Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.