Hydraulic Servo Systems

Hydrauliska servosystem
6 credits

Programme course

TMHP51

Valid from: 2024 Spring semester

Determined by	**Main field of study**	
Board of Studies for Mechanical Engineering and Design	Electrical Engineering, Mechanical Engineering	
Date determined	**Course level**	**Progressive specialisation**
2023-08-31	Second cycle	A1X
Revised by	**Disciplinary domain**	
	Technology	
Revision date	**Subject group**	
	Mechanical Engineering	
Offered first time	**Offered for the last time**	
Autumn semester 1996		
Department	**Replaced by**	
Institutionen för ekonomisk och industriell utveckling		

Course offered for

- Master of Science in Mechanical Engineering
- Master's Programme in Mechanical Engineering

Prerequisites

Fluid power systems, Automatic Control

Intended learning outcomes

This course intends to give a detailed knowledge in hydraulic servo systems and its applications. The contents of the course covers both the mobile and industrial areas and theor different characteristics. After completing the course the student is expected to

- understand the function and characteristics of hydraulic servo components
- be able to apply calculation methodology for component selection and system design
- be able to model and implement dynamic analyzes of closed loop hydraulic servo systems regarding performance, controllability and energy consumption
- be able to analyze measurements on components and systems

Course content

Extended theory on orifices, flow forces on valve elements and fluid physical properties. Modelling and simulation technology. Mathematical modelling of component and system dynamics. Control engineering analysis. Simulation of fluid systems dynamics. Proportional and servo valve designs and characteristics of different pilot and power stages. Servo systems for control of position, velocity and force. Multi-axis loads. Control strategies and dynamic characteristics. Sensor technologies and measurement methods for components specific to hydraulic servo systems.

Teaching and working methods

The teaching consists of lectures, lessons and laboratory exercises. Educational study visits are made to different industries.

Examination

UPG2	Hand-in assignment	2 credits	U, G
TEN3	Written examination	3 credits	U, 3, 4, 5
LAB3	Laboratory work	1 credits	U, G

Grades

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

Other information

Supplementary courses

TMHP06 - Fluid power systems, advanced course
TMMS32 - Modelling and simulation of mechatronic systems
TMPM06 - Project Course Advanced - Mechatronics

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

The course is campus-based at the location specified for the course, unless otherwise stated under “Teaching and working methods”. Please note, in a campus-based course occasional remote sessions could be included.