Fluid Power Systems and Transmissions

Programme course

6 credits

Fluida system och transmissioner

TMMS10

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined
2017-01-25

Offered for the last time
Spring semester 2020

Replaced by
TMHP06

Main field of study
Mechanical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Mechanical Engineering, M Sc in Engineering
- Mechanical Engineering, Master's programme

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
Fluid Power Systems, Automatic Control

Intended learning outcomes
The course is intended to give a broad knowledge in hydraulic system design. Especially, hydro-mechanical transmissions and hydraulic valve controlled systems are treated The knowledge aims for the course are:

- to convey deep knowledge about component functionality and characteristics in the area of hydro-mechanical transmissions and mobile hydraulic systems.
- to give knowledge about calculation methods and system design.
- to convey knowledge about control principals and control engineering methods with respect to controllability and energy consumption.
- to give insight in measurement methods and computer usage for system analyses.

The skill aims for the course are:

- be able to model and analyse hydraulic systems with respect to performance, controllability and energy consumption.
- be able to apply calculation methods for component selections and system design.
- be able to perform measurements on components and systems.
- be able to evaluate environmental and ergonomic aspects.

Course content

- Hydraulic machines: Design of different types of pumps and motors. Analyses of losses and efficiency models. Control actuators for variable displacement machines. Dynamic properties of hydraulic machines.
- Transmission systems: Mobile and industrial applications. Completely hydraulic and hydro mechanical divided types of transmissions - principles of automatic control and dynamic characteristics. Servo systems for control of shaft speed and torque. Simulation of transmission drive systems.
- Valve controlled systems: Steady state and dynamic properties of pressure and flow control valves. Mobile and industrial applications. Open and closed systems. Load sensing hydraulic systems.

Teaching and working methods

The teaching consists of lectures, lessons and laboratory exercises

Examination

LAB1	Laboratory Work	1.5 credits	U, G
TEN1	Examination	4.5 credits	U, 3, 4, 5

Grades

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

Other information

Supplementary courses: Mechanical Engineering Systems-Project Course.

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Peter Hallberg

Examiner

Liselott Ericson

Course website and other links

http://www.iei.liu.se/flumes/tmms10

Education components

Preliminary scheduled hours: 56 h
Recommended self-study hours: 104 h

Course literature

Kompendiematerial; Rydberg K-E, Andersson B R, LiTH. Vetenskapliga artiklar.

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://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.