



Faculty of Technology and Science
Mechanical Engineering

Syllabus

Course Approval

The syllabus was approved by the Faculty Board of Technology and Science on 28 May 2009, and is valid from the Spring semester of 2009 at Karlstad University.

Course Code: MSGB24

Hydraulics and Pneumatics, 7.5 ECTS Credits
(Hydraulik och pneumatik, 7.5 Swedish credit points)

Degree Level: Bachelor

Progression Level: B

Language of Instruction

Swedish

Prerequisites

Mathematics for engineers, 15 ECTS Credits, and Mechanics, 7.5 ECTS Credits, or the equivalent.

Major Field of Study

Mechanical Engineering

Learning Outcomes

Upon completion of the course, students should be able to:

- give an account of important properties of hydraulic fluids
- perform calculations, based on basic fluid flow theory, for flows and pressure drops in hydraulic components
- give an account of common types and important properties of hydraulic pumps, hydraulic motors, and hydraulic cylinders
- describe the function of common constructions of directional-, pressure-, flow-, proportional-, and servo-valves
- propose suitable solutions for hydrostatic systems, meeting the requirements of technical performance and describe the solutions in circuit diagrams
- compare hydraulics and pneumatics to each other in terms of technical performance
- establish a circuit diagram in order to obtain sequence control of a number of cylinder movements
- give account of the power transmission of a hydraulic drive system and calculate its properties in terms of degree of efficiency and displacement.

Content and Form of Instruction

The course contains lectures, laboratory exercises, and hand-in assignments covering:

- hydraulic fluids
- basic fluid flow theory
- hydraulic pumps, hydraulic cylinders, and hydraulic motors
- valves
- accumulators
- hydrostatic systems

- hydrodynamic systems
- pneumatic systems
- pneumatic sequence control
- maintenance.

Reading List

See separate document.

Examination

Examination is in the form of laboratory exercises, hand-in assignments, obligatory seminars, and written exam.

Grades

One of the grades Fail (U), 3 (Pass), 4 (Some Distinction), or 5 (Distinction) is awarded in the examination of the course.

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course assessment is based on student views and experiences as reported in written course evaluations and/or group discussions. Students will be informed of the result of the evaluation and of the measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional Information

Students who enrolled before 1 July 2007 will complete their studies in accordance with the requirements of the earlier admission. Upon completion students may request degree and course certificates to be issued under the current ordinance if they meet its requirements.

The local regulations for studies at the Bachelor's and Master's levels at Karlstad University, ref. C2007/368, stipulate the obligations and rights of students and staff.

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