MJ2429 Turbomachinery 6.0 credits

Strömningsmaskiner

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for MJ2429 valid from Autumn 2010

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

MJ1112 Applied Thermodynamics, 9 ECTS or equivalent + MJ1401 Heat transfer, 6 ECTS or equivalent + Fluid Mechanics, 6 ECTS or equivalent or a combination of these courses corresponding to at least 15 ECTS and documented proficiency in English corresponding to English B

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The course aims at giving an overview of different types of fluid machinery used for energy transformation, such as pumps, fans, compressors, as well as wind- , hydraulic, steam- and gas-turbines. applications for transfer to power, as well as for energy use in refrigeration and the built environment are important.

Course contents

Almost 100% of the world's electricity is generated in processes where fluid machinery is an integral part of the system. Fluid machines are integral parts of a large number of products used in daily life (pumps in refrigerators, fans in computers/cars, transportation of fluids like water, oil, etc.). Fluid machines are to a very large extent used in the propulsion of transport vehicles (jet engines and propellers for airplanes, turbochargers for cars, gas turbines for fast ferries.)

The aero- and thermodynamic terminology and equations relevant for all these machines are discussed extensively. A modern computerized educational program is the basis for the education. In this the essential fundamental theory is explained in an interactive and animated way. Today's and tomorrow's need for fluid machines is discussed and the future development and research needs are briefly described. The principles of energy saving by matching a pump system with the pump installation are treated. Details about the construction of some fluid machines are sketched. Calculation and laboratory exercises are performed with the aim to understand the physical relationship between the aero- and thermodynamics of the machine.

The course is the basis for more advanced studies in turbomachinery technology, in which detailed studies of modern machinery, design methods, modern computational methods and experimental techniques are given.

Course literature

Vogt, D., 2005, "Lecture Notes in Turbomachinery", Collection of short pdf documents, KTH, Heat and Power Technology

Fransson, T. H. et. al. 2001, CompEduHPT: Computerized Educational Heat&Power Technology Program. HPT/KTH Stockholm, Sweden

Valda artiklar

Kompletterande litteratur (ej obligatorisk):

Dixon, S.L., 1998

"Fluid Mechanics and Thermodynamics of Turbomachinery" Fourth edition, Butterworth-Heinemann, Woburn, MA, USA, 1998 ISBN 0-7506-7059-2

Examination

- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F
- TENA - Written exam, 2.0 credits, grading scale: A, B, C, D, E, FX, F
- TENB - Written exam, 2.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

A written exam (TEN1; 4,5 hp); and completed lab-work assignments (LAB1; 1,5 hp).

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.