



# MJ243U Turbomachinery, Commissioned Course for Industry

## 3.0 credits

Strömningmaskiner, uppdragsutbildning för industrin

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

### Establishment

Course syllabus for MJ243U valid from Autumn 2015

### Grading scale

P, F

### Education cycle

Second cycle

### Main field of study

Mechanical Engineering

### Language of instruction

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

### Intended learning outcomes

The course general aim is to give an overview and applied tools for the student to handle specific aspects within turbomachinery according to the customer's wish as it is a contract education. Focus can be on turbo applications within the transport sector (aircraft engines, turbo chargers, ship propulsion) and the energy sector (steam and gas turbines for power generation) depending on which modules that are chosen.

After completion of the course, the student will be able to:

- Explain 2D and 3D flow related phenomena in turbomachinery components
- Basic understanding of non-stationary flow phenomena in turbomachinery
- Understand the basic philosophies for blade design
- Carry out simple aerodynamic blade design
- Explain the interaction between flow fluid and mechanical structure
- Understand basic aeromechanical design aspects
- Understand the basic combustion chamber principles and their challenges
- Understanding basics of heat transfer and cooling techniques related to turbomachines
- Discuss the challenges of today and tomorrow related to turbomachines

## Course contents

Starting from one-dimensional analysis of turbomachinery components, the view is widened to two-dimensional and three-dimensional aspects. Experimental data, numerical calculations and laboratory experiments are combined to give the student a deep understanding over the flow phenomena in turbomachines. Detailed aspects such as cooling technology, aeromechanics, materials and system properties are explained to give a context. Calculation examples are used to deepen the understanding of the phenomena dealt with. Online tests will be available during the course and is a part of the examination.

## Course literature

Current edition is posted on the course web page no later than four weeks before the start of the course.

## Examination

- LAB1 - Laboratory Exercise, 0.5 credits, grading scale: P, F
- TEN1 - Exam, 2.5 credits, grading scale: P, F

## 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.