# MF203U Internal Combustion Engines Basic Course II, Commissioned Education 6.0 credits

**Förbränningsmotorteknik grundkurs II, uppdragsutbildning**

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

## Establishment

Course syllabus for MF203U valid from Autumn 2015

## Grading scale

P, F

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering

## Specific prerequisites

Knowledge in mathematics, mechanics and thermodynamics, equivalent to the three first years of the engineering programmes in Vehicle engineering, Mechanical engineering and Design and product realisation.

## Language of instruction

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

## Intended learning outcomes

After passing the course, the student should be able to:

- Describe the basic mechanical design of the piston engine
- Describe how the choice of engine configuration influences the vibrations of the engine
- Describe the function of the cooling system and its included components
- Describe the function of the lubrication system and its included components
- Calculate basic thermodynamic data for a complete work cycle in an engine
- Calculate required amount of fuel for stoichiometric combustion of some common fuels
- Account for combustion system function in the Otto engine
- Account for the emission formation in the Otto engine
- Account for how the emissions are controlled in the Otto engine
- Account for combustion system function in the diesel engine
- Account for the emission formation in the diesel engine
- Account for how the emissions are controlled in the diesel engine
- Describe how legal requirements influence the engine development

## Course contents

The contents intend to give a solid base for development work, production and application of piston engines with internal combustion, with a focus on diesel and Otto engines, which mainly implies:

- A general orientation around the properties of the engine
- A survey of the engine's mechanical design with a focus on important components
- The thermodynamics of engines
- The combustion of engines
- Exhaust emissions, how these are formed and reduced, and their influence on man and the environment
- Fuels and their influence on the environment
- Legal requirement

## Disposition

The course contains a mixture of lectures, self-study, seminars and laboratory sessions.

## Course literature

Richard Stone, Introduction to internal combustion engines

Bosch Automotive handbook

Material from lectures in the course

Material from seminars in the course

## Examination

- SEM1 - Seminar, 2.0 credits, grading scale: P, F
- INL1 - Hand in Exercise, 3.0 credits, grading scale: P, F
- LAB1 - Laboration, 1.0 credits, grading scale: P, 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.

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

## 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.