

## COMBUSTION ENGINES

### 1.1. Identification

University:	Kungl Tekniska Högskolan (KTH), Stockholm, Sweden												
School:	School of Chemical, Science and Technology												
Course:	Combustion Engines												
ECTS:	6												
Semester:	<i>Winter</i>				X	<i>Summer</i>							
Category	<i>Fundamental course</i>						<i>Specialisation course</i>						X
Module	<i>MFI</i>		<i>MFII</i>		<i>MFIII</i>		<i>MSI</i>	X	<i>MSII</i>		<i>MSIII</i>		
Teachers:	Hans-Erik Ångström												
Language:	<i>English</i>	X	<i>Italian</i>		<i>Swedish</i>	X	<i>Spanish</i>						

### 1.2. Learning-outcomes

- knowledge modern combustion engines including historical background and competing technology.
- knowledge in design aspects with respect to manufacturing and choice of material etc.
- knowledge in exhaust emissions from diesel- and SI-engines and how to reduce them.

### 1.3. Competencies

#### ▪ General

- to have critical understanding of technical and scientific tools
- to work and manage teams
- communication skills (both written and oral)
- to work in an international context

#### ▪ Specific

- to analyse the design of current combustion engines
- to give a thermodynamic and combustion related background.

### 1.4. Contents

Performance, combustion and emissions from diesel- and from SI-engines, supported by own laboratory measurements. Engine emissions reduction. Electronic control systems. Vibrations from reciprocating movements and from torque pulses. Design and specific improvements for selected vehicle engines. Modern simulation software to analyse and optimise engine performance. Current and future fuels

### **1.5. Teaching Methodology**

- Lecture sessions
- Practical sessions: “cooperative work” for solving problems
- laboratory sessions

### **1.6. Evaluation**

- written exams
- oral evaluation of the problems solved by “cooperative work”
- oral evaluation of laboratory work

### **1.7. Bibliography**

- Bosch. Automotive Handbook (in German or English).
- Bosch. Avgasteknik för Ottomotorer (in Swedish).
- Heywood. Internal Combustion Engine Fundamentals (McGraw-Hill).