

Course number: ASE 40810
Technologies of Combustion Engines
and Exhaust Gas Aftertreatment
Study level: Master / Graduate

Prof. Dr.-Ing. Karen Schirmer

Prof. Dr. Alexander Basler

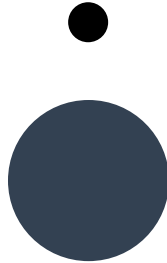
Language of instruction: English

ECTS Credits: 6

Objectives:

The students

- use the appropriate English vocabulary for the special components and processes in modern combustion engines with exhaust gas aftertreatment
- apply the fundamentals of thermodynamics to the processes of an internal combustion engine
- derive modelling equations concerning energy, entropy and mass flow
- know how to influence the combustion process in order to minimize emissions, especially CO₂ versus NO_x
- know and understand the construction, design and function of conventional exhaust gas aftertreatment systems
- know and understand how conventional exhaust gas aftertreatment systems work
- evaluate performance data from aftertreatment systems
- recognize the difference between good performance and performance that is hampered by certain deactivation mechanisms
- apply what they have learned to case studies appropriately
- competently discuss current issues and new developments in exhaust gas aftertreatment systems in a scientific, political and social context
- find convincing arguments for the path to a sustainable transport system in political discussions

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Optimization of Internal Combustion Engines (Prof. Dr. Alexander Basler)

- Basic principles of combustion engines
- Special English vocabulary concerning internal combustion engines
- Tuning possibilities of the combustion process
- Optimization of the effects on NOx and CO2
- Modern methods of optimizing internal combustion engines (e.g. cylinder deactivation)
- Special aspects of truck and train engines
- Special aspects of maritime and power generator engines
- Special aspects of alternative fuels e.g. bio ethanol or hydrogen

Exhaust Gas Aftertreatment (Prof. Dr.-Ing. Karen Schirmer)

- Emissions and their effects on health and environment
- Emission standards
- Catalyst fundamentals, characterization, deactivation
- Design, function and functioning of common emission abatement technologies