



# KE2051 Environmental Catalysis 7.5 credits

## Miljökatalys

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 KE2051 valid from Autumn 2018

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Chemical Science and Engineering

## Specific prerequisites

KE1175 and KE1160

or

MF2015

or

or equivalent knowledge

## Language of instruction

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

## Intended learning outcomes

The course gives an in-depth knowledge of modern emission reduction technologies using catalytic methods. The course includes subjects such as characterization of emissions, health effects, introduction about internal combustion engines and their history, pollutant formation, test cycles, emission standards, influence of fuel on emissions, motor fuel history, exhaust gas catalysts for various kinds of vehicles, aftertreatment system architecture and design, catalyst deactivation, production of catalysts, control of stationary emissions (VOC NO<sub>x</sub>), design of units for abatement of nitrogen oxides and VOC, catalysis in oil refining, production of motor fuels with low content of sulfur and aromatics, hydrogen generation from various fuels for fuel cell vehicles and for emission abatement, and market strategies.

## Course contents

The course discusses chemical processes that employ catalysts to control the emissions of environmentally unacceptable compounds and the course also covers processes which eliminate the formation of such substances. A special emphasis will be put on abatement of emissions from mobile sources. New and emerging catalytic technologies will be given special attention. The general concepts will be covered in lectures, while detailed studies will be performed in supervised seminar assignments. Focus areas will be presented by key experts from Swedish vehicle industry. We will also make a study visit in the laboratories of KTH's strategic partner Scania Commercial Vehicles in Södertälje. The seminar assignments cover current problems in industry or in the society. These will be presented orally at seminars as well as in a technical paper. Laboratory exercises are included to give hands-on experience with emission testing and internal combustion engines. These exercises are performed in cooperation with Internal Combustion Engines at KTH.

## Course literature

TBD

## Examination

- LAB1 - Laboratory work, 1.5 credits, grading scale: P, F
- SEM1 - Seminars, 3.0 credits, grading scale: P, F
- TEN1 - Written exam, 3.0 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.

## 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.