MJ2420 Combustion Theory 6.0 credits

Förbränningslära

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

Establishment

Course syllabus for MJ2420 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

4A1112 Applied thermodynamics and
4A1601 Heat Transfer, or equivalent

Language of instruction

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

Intended learning outcomes

This course is aimed to give deep knowledge about what is happening at combustion for different kind of fuels. After finished course the student should be able to

- Understand and explain different expressions and parameters that are involved in the theory of combustion
- Describe a number of definitions and laws
- Calculate the energy development at combustion of a species
- Appoint different properties for a chemical reaction, such as equilibrium, flame temperature, etc
- Set up a number of the chemical reactions that occur in the course
- Know which models are used to describe combustion of gases, liquids respective solids, and be able to sketch these models
- Know the difference of different types of flames and what characterizes each type.

Course contents

The course is introduced by a review of different definitions and parameters that are used to describe combustion, ex. stoichiometry, enthalpy of reaction, equilibrium. In connection with these definitions a number of laws are described as support for determine the values of the parameters at a reaction. Furthermore, different types of reactions are brought up and their kinetics. An important aspect is what happens at ignition. Models, that are used to describe combustion of different kinds of fuels, will be analysed as well as different types of flames that occur depending on fuel, air-supply and burner.

Course literature

Turns, S. R. 1996. An Introduction to Combustion. McGraw-Hill, Singapore. ISBN 0-07-0655316.

Examination

- TEN1 - Examination, 6.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 0.0 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.

Other requirements for final grade

Lab work 0 cr
Written exam (TEN1; 6 cr)

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.