



Modeling of combustion processes – theory and application

Modellering av förbränningsprocesser – teori och tillämpning

7.5 credits

7.5 högskolepoäng

Ladok Code: 42K13C

Version: 3.0

Established by:

Valid from: Autumn 2011

Education Cycle: Second cycle

Main Field of Study (Progressive Specialisation): Energy and Material Recovery (A1F)

Disciplinary Domain: Technology

Prerequisites: These prerequisites do not apply to students within the programme Science without Borders.

Admitted to the masters programme Resource recovery – Sustainable Engineering

Subject Area: Energy Technology

Grading Scale: ECTS-credits

Content

Combustion of solid, liquid and gaseous fuels

Transport equation for systems in one or more dimensions with focus on heat and mass transfer

Coupled transport equations

Determination of reaction kinetics of thermal processes

Learning Outcomes

After completing this course, students must be able to:

- Use heat balances in one or more dimensions for both stationary and dynamic systems
- Calculate heat transfer problems with conduction, convection and radiation
- Determine what is the rate limiting step in thermal reaction process according to mass transfer, heat transfer or intrinsic reaction rate
- Derive fundamental (intrinsic) reaction kinetics of pyrolysis and gasification
- Know which experimental equipment that are used when the kinetics are determined and how they are used

Forms of Teaching

The teaching comprises the following elements: Lectures, exercises, assignments and laboratory work. The teaching language is English.

Forms of Examination

The course will be examined through the following examination elements:

Written exam

Learning outcomes:

Credits: 4.5

Grading scale: ECTS-credits

Hand-in assignments

Learning outcomes:

Credits: 3

Grading scale: Fail (U) or Pass (G)

Student rights and obligations at examination are in accordance with guidelines and rules for the University of Borås.

Literature and Other Teaching Materials

Literature

Incropera, DeWitt, Bergman, Lavine: Fundamentals of Heat and Mass Transfer, 7th ed.

Written material.

Student Influence and Evaluation

The head of department and the teacher responsible for the course are responsible for ensuring that students are invited systematically and regularly to put forward their views on the course. The results of the evaluations will be reported back to the students and will form the basis for the future structure of the course.

Miscellaneous