MH1018 Transport Phenomena 6.0 credits

Transportfenomen

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

Establishment

Course syllabus for MH1018 valid from Autumn 2017

Grading scale

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

Education cycle

First cycle

Main field of study

Technology, Materials Science

Specific prerequisites

Knowledge equivalent to that obtained after completing the courses in:

- SG1120 Mechanics I
- SF1633 Differential Equations

Or similar.

Language of instruction

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

Intended learning outcomes

After the course you will be able to perform flow calculations in relevant systems and show an understanding of how transport phenomena affect our daily lives.More concretely, this means that you should be able to:

- Explain the commonly used concepts and laws in momentum, heat and mass transport, and where transport phenomena play an important role in society.
- Derive the equations that form the basis of momentum, heat and mass transport, and understand the similarities between these.
- Communicate results and hypotheses verbally and in writing, as well as argue for these.
- Explain and reflect on many everyday phenomena based on your knowledge of transport phenomena.
- Solve and formulate simple engineering problems, as well as perform a reasonable analysis of the solution obtained.
- Solve a complex problem by breaking it down into smaller parts and simplifying these with reasonable assumptions.

Course contents

Transport phenomena are a topic that describes the flows of motion, heat and matter. Over the years, together with thermodynamics, it has become one of the most important ones witin materials technology.The course describes how the equations are derived and solved without the help of computers. For simplicity, the subject is divided into the following three parts:

- Momentum Transport
- Heat transfer
- Mass Transfer

Although the above phenomena are physically completely indifferent, they can be treated mathematically in a similarl way. During the course this will be apparent when similar equations describe the transport of the above-mentioned parts.

Disposition

The course includes, in addition to the exam:

- Lectures
- Exercises
- Written tests
- Seminar

Course literature

Meddelas vid kursstart.

Någon av följande två böcker rekommenderas (lässchema baseras på den första av dessa):

- "Transport and Chemical Rate Phenomena". Themelis, Nickolas J., OPA (Overseas Publishers Association, Amsterdam, The Netherlands (1995). ISBN 2-88449-127-9.
- "Transport Phenomena, 2nd edition". Bird R.B., Stewart W.E., Lightfoot E.N., Wiley (2007). ISBN 978-0-470-11539-8.

Examination

- ÖVN1 - Assignments, 1.0 credits, grading scale: P, F
- TEN2 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 2.0 credits, grading scale: A, B, C, D, E, FX, 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

Written exam, approved written report and oral presentation and opposition during the seminar

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.