FAF3704 Fluid and Climate Theory 7.5 credits

Strömnings- och klimatteori

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

Establishment

Course syllabus for FAF3704 valid from Spring 2019

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Entry requirements for PhD studies in architectural engineering or similar knowledge. Basic course in fluid mechanics is required.

Language of instruction

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

Intended learning outcomes

The research within Fluid and Climate Theory deals with the impact of indoor climate on people's well-being, health and performance levels. It shows which factors make up the concept indoor climate and how they can be translated into measurable design requirements.

Course contents

Health and comfort effects of indoor air conditions including airborne contaminants on human beings are introduced. Sensation of draught is as an example dependent on air temperature, air velocity and turbulence intensity in the air. The concentration of emissions in a room and room temperature are not only dependent on ventilation flow rates and heat sources but also on the degree of mixing, i.e. the flow pattern through the room. Indoor climate requirements and building services vary according to the intended purpose of the building. Modern design methods and tools are introduced.

Disposition

- Fundamental fluid mechanics
- An introduction to Navier- Stokes equations and CFD modelling
- Effects of indoor climate on humans
- Physical climate factors
- Air distribution and climate control
- Examples for evaluation

Course literature

Y.A. Cengel and J.M.Cimbala, Fluid Mechanics Fundamentals and Applications, Mc-Graw-Hill, Inc., 2006 ISBN-13:978-007-125764-0 or ISBN-10:007-125764-0.

Achieving the desired indoor climate, Studentlitteratur, Lund, 2003 (Art. No. 31541).

Relevant journal articles and conference articles.

Examination

- SEM1 - Seminars, 2.5 credits, grading scale: P, F
- TEN1 - Written exam, 2.5 credits, grading scale: P, F
- RAP1 - Literature report, 2.5 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.

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.