



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Matematisk modellering, fortsättningskurs **Mathematical Modelling, Advanced Course**

FRTN45, 4,5 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED F/Pi

Date of Decision: 2023-04-18

General Information

Main field: Technology.

Compulsory for: Pi3

Elective for: F4, F4-bs, I4

Language of instruction: The course will be given in Swedish

Aim

The aim of the course is to strengthen and develop the student's knowledge and skills in modelling in the form of basic theory and a practical project.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- have improved his/her basic knowledge about mathematical modelling
- have developed new knowledge and skills within the area of the project

Competences and skills

For a passing grade the student must

- be able to perform several of the phases in a typical modelling project: identification of the aim of the model, data collection, analysis, model structure selection, parameter estimation, simulation, validation, documentation, and presentation
- be able to present the project results on both oral and written form
- show ability for teamwork and collaboration

Judgement and approach

For a passing grade the student must

- understand the relations and limitations when simplified models are used to describe a complex reality

Contents

The lectures (20% of the course) present different model types and describe the foundations for physical modelling as well as modelling from measured data. Model validation is a central concept. Simulation methods for different model types are presented.

The project part (80% of the course) should involve expertise from several different areas. The project plan and regular project meetings are central parts of the course. The written report should be put in relationship with the content of the lectures.

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)

Assessment: Accepted project. Oral and written project presentation and written and oral opposition.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

Assumed prior knowledge: FMAF05 Mathematics - Systems and Transforms, FMSF10 Stationary Stochastic Processes, FMAN55 Applied Mathematics.

The number of participants is limited to: No

The course overlaps following course/s: FRT095

Reading list

- Lennart Ljung och Torkel Glad, Modellbygge och Simulering, Studentlitteratur, 2nd edition 2004, ISBN 91-44-02443-6.

Contact and other information

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Course homepage: <http://www.control.lth.se/course/FRTN45>