



# F6L5006 Applied Dynamic Finite Element Analysis 6.0 credits

Applicerade dynamisk finitelementanalys

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

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for F6L5006 valid from Autumn 2012

## Grading scale

## Education cycle

Third cycle

## Specific prerequisites

Accepted for doctoral studies at KTH or KI.

## Language of instruction

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

## Intended learning outcomes

To introduce important computer tools for applied dynamic Finite Element Analysis (FEA).

## Course contents

The course content is decided from the needs of the present graduate students. Theory and practical use of dynamic FEA is studied. LS-DYNA has become a leading finite element, FE, program in large deformation mechanics, vehicle collision simulations and crashworthiness design as well as for metal forming simulations. This course will give a practical and theoretical introduction to LS-DYNA. The course is suited for users, which have limited experience and want an overview of the LS-DYNA possibilities.

- Implicit and explicit finite element methods
- Keyword format
- Element formulations
- Material models
- Rigid bodies
- Initial conditions
- Boundary conditions
- Contacts
- Output format and output files
- Pre- and post processing with LS-PREPOST
- Selected exercises throughout the course

## Disposition

Half speed, self-study and ongoing discussions with the teacher.

## Course literature

Kleiven, S; Halldin, P; Zenkert, D, **Dynamic Finite Element Methods**, Lecture Notes for 4E1150, Stockholm Sweden 2001, Skrift 2001-15, Department of Aeronautics, KTHBe-lytschko, T; Liu, W K; Moran, B, **Nonlinear Finite Elements for Continua and Structures**, West Sussex England 2000, John Wiley & Sons Ltd.  
Bathe, K-J, **Finite Element Procedures**, Upper Saddle River USA 1996, Prentice-Hall Inc.

Depends on the current contents of the course.

## Examination

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.

Seminars, individual activity and written hand-in exam.

## **Other requirements for final grade**

Attended seminars and approved written exam.

## **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.