FAF3212 Non-Linear FEM Civil Engineers 7.5 credits

Ickelinjär FEM för civilingenjörer

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

Establishment

Course syllabus for FAF3212 valid from Spring 2019

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

- Passed courses in basic finite element theory
- Experience in MATLAB programming

Language of instruction

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

Intended learning outcomes

The purpose of this course is to give engineers, scientists and researchers a deeper insight into the finite element method with an emphasis on methodologies and applications for

non-linear problems. The fundamental theoretical background, the computer implementations of various techniques and modeling strategies will be treated. Practical implications of recent research developments will be stressed.

Course contents

- Different strain measures
- Derivation of non-linear 2D truss, 2D beams, 3D beams, plane and Shell elements
- Basic plasticity
- Structural stability analysis
- Advanced solution procedures
- Commercial FEM programs for analysis of non-linear problems

Course literature

Crisfield, M. A., Non-linear Finite Element Analysis of Solids and Structures, Vol. 1: Essentials, J. Wiley & Sons, 1996. (345 pages)

Examination

- TEN1 - Written exam, 4.5 credits, grading scale: P, F
- INL1 - Home assignment, 3.0 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.