



ML2201 Computerized Tools in Mechanical Design, Intermediate Course 7.5 credits

Datorbaserade konstruktionsverktyg, fortsättningskurs

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 ML2201 valid from Autumn 2012

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

Knowledge in ProEngineer corresponding to HM1002/6S2402 (Computerized Tools in Design Process, Basic Course) and insight into multidimensional stress analysis corresponding to HM1004/6S2404 (Solid Mechanics, Intermediate course).

Language of instruction

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

Intended learning outcomes

The course's overall objective is to give knowledge about using different types of computer based design tools in a structured way, in order to provide improved quality in supporting the design process

After the course, students will be able to:

- Identify and apply appropriate modeling strategy. Selection of strategy is based on a product's geometry, functions and possible considerations for manufacturing and fe-analysis
- Define interfaces for coordinated design work with several participants by using support provided within used software
- Assemble and analyze digital mechanisms
- Describe how finite element programs are structured and what data needs to be given to solve a practical problem
- Defining boundary conditions and interpret the results with a finite element analysis software
- Exemplify and use idealizations in building FE models
- Use a commercial finite element software for solving multi-dimensional elastic problems
- Compare, evaluate and document the results of different types of FE models
- Independently organize, implement and document a major CAE task that includes modeling and FE-analysis

Course contents

- Solidmodelling
- Managing large assemblies
- Modelling sheetmetal parts
- Modelling mechanisms
- Strength of materials calculations using FE-analysis
- Introduction to FE-analysis, different element types and solution methods of
- Formulation of boundary conditions for FE-analysis
- Convergence, idealization, approximations, symmetry
- Solution of nonlinear problems using a commercial finite element software
- Documentation and interpretation of results from FE-analysis

Disposition

The course is carried out mainly through exercises with supportive briefings in a commercial software.

Course literature

Kurslitteratur meddelas 1 månad före kursstart.

Examination

- ÖVN1 - Exercises, 4.5 credits, grading scale: P, F
- ÖVN2 - Exercises, 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.

Other requirements for final grade

Approved individual computer exercises (ÖVN1; 4.5 ECTS credits), P/F grading scale
Approved major computer exercise (ÖVN2; 3 ECTS credits), P/F grading scale

Criteria for final grade are based on examination and is announced at the start of the course.

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.