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.

Establishment

Course syllabus for ML2201 valid from Autumn 2017

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

Completed courses with passing grades in ML1201, ML1204, ML1212 and ML1302.

Language of instruction

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

Intended learning outcomes

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

- Solid modelling

- Modelling large assemblies

- Modelling mechanisms

- Strength of materials calculations using FE-analysis

- Introduction to FE-analysis, different element types and solution methods•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 assumes that students actively plan their studies and work independently with the software. Lectures, seminars and teacher support in computer labs shall encourage the students in their knowledge acquisition and skills development.

Course literature

- Toogood, Roger. 2015. Creo Simulate 3.0 Tutorial; Structure and Thermal. Mission, KS; SDC Publications. ISBN 978-1-58503-987-6 (tryckt bok).

- Chang, Kuang-Hua. (2015) Mechanism Design and Analysis; Using PTC Creo Mechanism 3.0. Mission, KS; SDC Publications. ISBN 978-1-58503-946-3 (tryckt bok).
- Programvarornas digitala dokumentation. Programvarorna och utbildningsmaterial från programvarorna från leverantören är på engelska. Övrigt material som studenterna behöver görs tillgängligt för studenterna i digital form under kursens gång.

Examination

- ÖVN1 - Exercises, 4.5 credits, grading scale: P, F
- DEX1 - Examination in Computer Laboratory, 3.0 credits, grading scale: A, B, C, D, E, FX, 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.

Other requirements for final grade

Passing grades in all examination moments. The final grade is based on the grade from DEX1.

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.