ML1101 Mechanics, General Course 7.5 credits

Mekanik, allmän kurs

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

Establishment

Course syllabus for ML1101 valid from Spring 2015

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Language of instruction

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

Intended learning outcomes

After completing the course, the student should be able to:

- based on a concrete mechanical problem, make idealisations and, with explanations, set up a mathematical model, analyse the model and critically review the results.
- distinguish between reality and theoretical models
- interpret and assess the plausibility of results
- define the basic concepts of mechanics, such as speed, acceleration, mass, time, force and torque, and account for the relationships between them.
- formulate and solve force and torque equations, both for static problems and dynamic problems limited to inertial reference frames.
- formulate and solve equations for particles and rotating bodies in plane motion
- calculate forces and equilibria for a mechanical system in rest
- calculate linear and angular acceleration for non-equilibrium mechanical systems
- use energy and power relations

Course contents

- Quantities, units and dimensions.
- Free-body diagrams
- Force and moment systems
- Equilibrium for particles and rigid bodies
- Simple machines
- Particle kinetics in cartesian coordinates and natural components. Inertial system.
- Friction
- Plane motion. Moment of inertia. Theorem of parallell axes.
- Bearing reactions
- Energy, work, power and losses.
- Critical oscillations
- Problem-solving, including interpretation and plausibility assessment.

Disposition

Lectures

Course literature

Mechanics for Engineers. Dynamics. 13th SI Edition.
R. C. Hibbeler & Kai Beng Yap. Pearson Higher
Education, Singapore, 2012. ISBN 9789810692612.

Statics and Mechanics of Materials, 4th Edition
in SI Units. Hibbeler & Cheong. Prentice Hall,
Pearson Education, Singapore, 2014.
ISBN 9789814526043.

Examination

- TEND - Examination, 3.7 credits, grading scale: P, F
- TENS - Examination, 3.8 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.

Other requirements for final grade

Approved results on both of the examinations, statics, TENS and dynamics, TEND, respectively

The final grade is given by the total sum of the two examinations

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.