



MJ2483 Advanced Mechanics Vibrations 6.0 credits

Fortsättningskurs vibrationer

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 MJ2483 valid from Autumn 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

Engineering mathematics, BSc level

Only for TAETM

Language of instruction

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

Intended learning outcomes

Advanced mechanical vibrations are studied primarily with emphasis on application of analytical and computational methods to machine design and vibration control problems. Equations of motion are developed using Lagrange's equations. A single degree-of-freedom system is used to determine free vibration characteristics and response to impulse, harmonic periodic excitations, and random. The study of two and three degree-of-freedom systems includes the determination of the eigenvalues and eigenvectors, and an in-depth study of modal analysis methods. The finite element method is used to conduct basic vibration analysis of systems with a large number of degrees of freedom.

The student learns how to balance rotating machines, and how to design suspension systems, isolation systems, vibration sensors, and tuned vibration absorbers.

Course contents

- Determine the free vibration characteristics and response to impulse, harmonic and periodic excitations, of a single degree-of-freedom system
- Demonstrate the effects of viscous and structural damping
- Determine the eigenvalues and eigenvectors and conduct modal response analysis of a 2 degree-of-freedom system
- Determine the eigenvalues and eigenvectors and conduct modal response analysis of a multi degree-of-freedom system
- Utilization of a finite element method (e.g. ANSYS) to conduct a basic vibration analysis

Course literature

Egen litteratur

Examination

- TENA - Examination, 6.0 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.

TEN, 6 ECTS, A-F

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.