

**SYLLABUS**

# **Mechanical Vibrations 7.5 credits M0015T**

**Maskindynamik**

**Course syllabus admitted: Autumn 2023 Sp 1 - Present**

**DECISION DATE  
2022-02-14**

# Mechanical Vibrations 7.5 credits M0015T

## Maskindynamik

### First cycle, M0015T

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Maskinteknik	Mechanical Engineering

## Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and basic requirements in solid mechanics (e.g. M0011T or matching), basic mechanics/dynamics (e.g. F0004T and F0006T or matching), basic mathematics (M0047M, M0048M och M0049M or matching. Good knowledge in English, equivalent to English 6.

## Selection

The selection is based on 1-165 credits.

## Course Aim

After passed course, the student shall be able to;

### 1. Knowledge and Understanding

- describe basic principles of mechanical vibrations and their properties
- explain the background and origin of equations of motion for simpler dynamic systems.
- explain the cause of vibrations in single-degree, multi-degree and continuous systems.

### 2. Skills and Abilities

- create and apply simpler models of single degree of freedom, multi-degree of freedom and continuous systems.
- use Matlab as a tool for dynamic calculations and be able to write simpler programs.
- develop programs for simulation of simple dynamic systems.
- design simpler dynamic systems to avoid breakdowns or minimize vibrations.

### 3. Judgement and Approach

- evaluate the reasonableness of analytical and numerical results.
- critically evaluate results from simpler dynamic analyses.

## Contents

The course deals with the basics of mechanical vibrations where the student should be able to develop and analyze simpler models of real problems. The course deals with basic machine dynamics such as

- single degree of freedom system (SDOF)
- multi degree of freedom system (MDOF)
- Lagrange equation
- vibration isolation and measurement technology
- dynamic simulation
- and continuous systems.

## Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The course is conducted through lectures where important elements of the course are highlighted and explained. Lessons in the form of some theory review and exercises that complement the lectures. Computer exercises give you the opportunity to create models yourself and simulate problems that an engineer may face.

## Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

To obtain a final grade in the course, approved computer exercises and passed on the written exam are required. The grading of the final grade for the course is based on the grade on the written exam.

## Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

## Overlap

The course M0015T is equal to MTM130, MTM172, M0019T

## Course offered by

Department of Engineering Sciences and Mathematics

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0003	Written exam	G U 3 4 5	6	Mandatory	A21	
0004	Computer exercises	U G#	1.5	Mandatory	A21	

## Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

## Last revised

by Niklas Lehto, Programme Director 2022-02-14

## Syllabus established

by Applied Physics and Mechanical Engineering 2007-02-28