

Experimental Mechanical Engineering

Experimentell maskinteknik
6 credits

Programme course

TMMT04

Valid from: 2025 Spring semester

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|--|---|-----------------------------------|
| Determined by | Main field of study | |
| Board of Studies for Mechanical Engineering and Design | Product Development, Mechanical Engineering | |
| Date determined | Course level | Progressive specialisation |
| 2024-08-28 | First cycle | G1F |
| Revised by | Disciplinary domain | |
| | Technology | |
| Revision date | Subject group | |
| | Mechanical Engineering | |
| Offered first time | Offered for the last time | |
| 2017 | | |
| Department | Replaced by | |
| Institutionen för ekonomisk och industriell utveckling | | |

Course offered for

- Master of Science in Mechanical Engineering

Prerequisites

Linear algebra, programming

Intended learning outcomes

The course aims to give understanding and skills to perform, document and analyse experiments in the area of engineering mechanics. The learning outcomes are fulfilled if the student can:

- recognize and present basic principles in engineering mechanics experiments.
- use physical quantities within the area of engineering mechanics and present the underlying phenomena which both historically and contemporary constitutes the basics for engineering quantification of properties of machines.
- summarize and present information collected from experiments by use of modern measurement methodology, statistics and evaluation.

The skill based outcomes aim to give the student the ability to:

- show good skills when using measurement methods and instruments typical for mechanical workshops, production control and data collection.
- design and realize experiments in a scientific manner.
- realize experiments in a safe manner and according to existing directives.
- document, report and communicate achieved results in for an engineer adequate way.

Course content

Basic theory: mechanical principles for force, moment, energy, temperature and influence on materials. Statistical measures. Outcomes of observations, accuracy and variance.

Properties of materials in engineering applications.

Computer based measuring methodology: practical handling and function of different electrical and mechanical measuring instruments such as micrometer, indicator, multimeter and oscilloscope. Handling of sampled information in computer based data collection systems.

Documentation and compilation of observations. Traceability and calibration.

Teaching and working methods

The main part of the course composes six different modules where each module illustrates a different part within the area of experimental engineering mechanics. Each module can contain one or more laboratory works. In some of the modules the experiments won't be available without preparation work from the students. Each module contains a presentation, either written, oral, poster or through digital media.

In addition to the modules, the course contains a number of lectures/seminars illustrating the area of experimental engineering mechanics where subjects such as science, measurement methodology, statistics and safety are presented. The course runs over the entire spring semester.

Examination

| | | | |
|------|----------|-----------|------|
| LAB6 | Module 6 | 1 credits | U, G |
| LAB5 | Module 5 | 1 credits | U, G |
| LAB4 | Module 4 | 1 credits | U, G |
| LAB3 | Module 3 | 1 credits | U, G |
| LAB2 | Module 2 | 1 credits | U, G |
| LAB1 | Module 1 | 1 credits | U, G |

Grades for examination modules are decided in accordance with the assessment criteria presented at the start of the course.

Grades

Two grade scale, older version, U, G

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

The course is campus-based at the location specified for the course, unless otherwise stated under “Teaching and working methods”. Please note, in a campus-based course occasional remote sessions could be included.

Common rules

Plagiarism

For examinations that involve the writing of reports, in cases in which it can be assumed that the student has had access to other sources (such as during project work, writing essays, etc.), the material submitted must be prepared in accordance with principles for acceptable practice when referring to sources (references or quotations for which the source is specified) when the text, images, ideas, data, etc. of other people are used. It is also to be made clear whether the author has reused his or her own text, images, ideas, data, etc. from previous examinations, such as degree projects, project reports, etc. (this is sometimes known as “self-plagiarism”).

A failure to specify such sources may be regarded as attempted deception during examination.

Attempts to cheat

In the event of a suspected attempt by a student to cheat during an examination, or when study performance is to be assessed as specified in Chapter 10 of the Higher Education Ordinance, the examiner is to report this to the disciplinary board of the university. Possible consequences for the student are suspension from study and a formal warning. More information is available at [Cheating, deception and plagiarism](#).

Linköping University has also produced a guide for teachers and students' use of generative AI in education (Dnr LiU-2023-02660). As a student, you are always expected to gain knowledge of what applies to each course (including the degree project). In general, clarity to where and how generative AI has been used is important.

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at <https://styrdokument.liu.se/Regelsamling/Innehall>.