

Experimental Mechanical Engineering

Experimentell maskinteknik
6 credits

Programme course

TMMT04

Valid from: 2023 Spring semester

Determined by	Main field of study	
Board of Studies for Mechanical Engineering and Design	Product Development, Mechanical Engineering	
Date determined	Course level	Progressive specialisation
2022-08-31	First cycle	G1X
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

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 a manner where both men's and women's experience and knowledge are made visible and developed.

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.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.

Common rules

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 http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.