

SYLLABUS

Advanced Project course in Tribology 15 credits M7034T

Avancerad Projektkurs i Tribologi

Course syllabus admitted: Autumn 2023 Sp 1 - Present

**DECISION DATE
2022-02-14**

Advanced Project course in Tribology 15 credits M7034T

Avancerad Projektkurs i Tribologi

Second cycle, M7034T

Education level

Second cycle

Grade scale

G U 3 4 5

Subject

Maskinelement

Subject group (SCB)

Mechanical Engineering

Entry requirements

A minimum of 7,5 ECTS in Mechanical Engineering, Materials Science and Technology, Physics, Mathematics and Machine Elements. More detailed knowledge in tribology, tribo-corrosion, tribo-materials, lubrication and lubricants, surface characterization facilitates is favorable (but this is not a prerequisite). Good knowledge in English, equivalent to English 6.

Selection

The selection is based on 30-285 credits

Course Aim

The student on completion of this course will be able to:

1. Knowledge and understanding

- Have knowledge and understanding of mechanisms and behavior of surfaces in contact and motion, in a tribological context (lubricated / non-lubricated)
- Have developed knowledge in different characterization methods in tribological context.
- Have developed knowledge and insight into the fact that “tribology is a multidisciplinary subject” and has interactions with other basic subjects in science, ie, physics, chemistry and materials science.
- Gain better insight into basic and applied research conducted at the machine element research subject, at the Department of Engineering Science and Mathematics.
- Understand the significance of tribology in the design of lubricated contacts
- Improve their ability in thinking and performing in a professional and engineering manner
- Get experience from working in larger development projects including several collaborating projects
- Get better knowledge and understanding of ongoing basic research and applied research projects at Division of Machine Elements.
- Get experience from engineering reasoning and problem solving from idea to prototype testing with focus on sustainable development

2. Skills and abilities

- Have had the opportunity to practice working independently, planning, carrying out and reporting scientific laboratory experiments
- Apply available tribological knowledge, models and experimental methods in design and analysis of lubricated / non-lubricated contacts in tribological context.
- Have practiced how to critically examine other people's scientific work
- Gain experience of both working on individual project and / or collaborating on projects with other students / doctoral students / business partners
- Be able to identify and apply mechanisms and models that enable analysis, design and optimization of surfaces in contact and movement.
- Be able to write technical reports / scientific manuscript according to given instructions.
- Be able to critically examine own results and can determine its validity. You can also suggest improvements.
- Present and explain their research results to Tribology experts
- Understand more advanced research issues and be able to be responsible for smaller research projects
- Have insight into the conditions for gender equality in working life

3. Ability of assessment and attitude

- Critically assess the validity and relevance of the available tribological knowledge, e.g. research articles and report
- Apply their knowledge and experience to carry out sustainable technical development in tribology
- be able to describe facts about gender equality in society and reflect on gender equality in technology and engineering.

Contents

This course is essentially ‘project work’ based and its contents are as follows:

- Work on projects (either individually or in groups)
- Special lectures (eg in friction, lubrication, abrasion processes, tribological damage, lubricants, coatings, tribo-materials, etc.) relevant for project topics, if necessary

Realization

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

The project work will be carried out by students (individually or in small groups) supervised by senior researchers / teachers. The project work may include analytical and / or experimental characterization methods and techniques. Some lectures can also be given if needed depending on the type of project being carried out. Regular meetings are booked during the course, where students present their own partial results and possible challenges in the project, and discuss relevant scientific issues.

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. The student will be evaluated based on the following:

- Interim assessment
- Final presentation of project results and discussion
- Extent and quality of the work accomplished as is evidenced from the written report

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 M7034T is equal to M7025T

Course offered by

Department of Engineering Sciences and Mathematics

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0004	Project work & report and oral presentation	G U 3 4 5	14	Mandatory	A21	
0005	Gender equality	U G#	1	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 HUL Niklas Letho 2020-02-14