

**SYLLABUS**

# **Surface Engineering 7.5 credits T7004T**

**Ytor**

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

**DECISION DATE  
2021-11-04**

# Surface Engineering 7.5 credits T7004T

## Ytor

### Second cycle, T7004T

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Materialteknik	Materials Technology

### Main field of study

Materials Science and Engineering

## Entry requirements

The course requires basic knowledge in materials science and engineering, solid mechanics and physics.

## Selection

The selection is based on 30-285 credits

## Course Aim

The aim for this course is to provide the student with:

- basic knowledge about different methods of surface modification and surface treatment
- in-depth understanding of how different material structures affects the surface properties
- knowledge of different physical laws and chemical reactions which affects the physical and mechanical properties of material surfaces
- in-depth understanding of tribological processes and knowledge of other aspects of the surface performance
- basic knowledge of different analytical techniques for surface analysis and characterisation of their performance

## Contents

Different methods for modification of material surfaces and surface treatment. Atomistic and microstructural description of surfaces together with morphological and surface topographical description of surfaces. The effect of surface energy, surface tension and wetting on the physical and mechanical properties of surfaces. Friction in sliding as well as rolling under dry and lubricated conditions. Different types of wear such as adhesive wear, abrasive wear, surface fatigue, fretting and erosive wear. Impact of corrosion on wear processes. Different methods for characterisation of surfaces especially from a tribological point of view. Surface engineering for friction and wear control.

## Realization

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

Lectures and laboratory project work. The laboratory project work is obligatory.

## 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. Written exam with differentiated grades, approved laboratory project work.

## 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 T7004T is equal to MPC005

## Course offered by

Department of Engineering Sciences and Mathematics

## Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Laboratory work	U G#	2.3	Mandatory	A07	
0003	Written exam	G U 3 4 5	5.2	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 Head Faculty Programme Director 2021-11-04

## Syllabus established

The syllabus was established by the Department of Applied Physics and Mechanical Engineering 2007-02-28, and remains valid from autumn 2007.