JÖNKÖPING UNIVERSITY
School of Engineering

COURSE SYLLABUS

Surface Technology, 7.5 credits

Ytteknik, 7.5 högskolepoäng

Course Code:	TYTS22	Education Cycle:	Second-cycle level
Confirmed:	Feb 01, 2025	Disciplinary domain:	Technology
Valid From:	Jan 19, 2026	Subject group:	Materials Technology
		Specialised in:	A1F Second cycle, has second-cycle course/s as entry requirements
		Main field of study:	Product Development

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

- show familiarity with the mechanisms behind corrosion and wear in relation to different application environments
- display knowledge of surface treatments, process parameters, as well as the relationship among material properties, process parameters and final performances
- show familiarity with cleaner production and environment protection measures and industrial safety aspects related to surface treatment industry

Skills and abilities

- demonstrate the ability to independently perform written calculations regarding process parameters and coating properties
- demonstrate the ability to identify and combine appropriate analysis methods for characterization of functional surface coatings, within the given timeframes, both in research and product development environments
- demonstrate the ability to compare different surface technologies from various perspectives identifying potential and limitation

Judgment and approach

- demonstrate the ability to a critical approach in setting the requirements for a surface treatment for a specific application
- demonstrate the ability to independently motivate the choice of surface treatment processes and process parameters, based on product requirements, and taking into account functional, environmental, safety and cost efficiency criteria

Content

The surfaces must meet the product requirements for both functionality and durability. Based on the understanding of the mechanisms behind the challenges, the surface treatment and coating techniques studied in this course constitute the tool case to achieve tailored surface properties of products in different applications filed.

The course includes the following elements:

- Surface degradation, corrosion, wear
- Fundamentals of chemistry and electrochemistry
- Pre-treatment and conversion coatings

- Anodizing
- Electroplating
- Thermal spray, laser-cladding, build-up welding
- Hot-dip coatings
- Organic coatings
- PVD, CVD
- Regulations, safety, and sustainability in surface-related processing

Type of instruction

Lectures, labs, project work.

Language of instruction is in English.

Entry requirements

Passed courses of at least 150 credits in the program Industrial Product Realisation including 15 credits in Mathematics, or passed courses of at least 90 credits in Materials and Manufacturing, Materials Engineering, Mechanical Engineering, Chemical Engineering, Product Development, Engineering Physics or the equivalent. Taken courses in Chemical Thermodynamic, 7,5 credits, and Metallic Materials: From Phase Transformation to Characterization, 7,5 credits, or the equivalent. Proof of English proficiency is required.

Examination and grades

The course is graded 5, 4, 3 or U.

Registration of examination:

Name of the Test	Value	Grading
Examination	4.5 credits	5/4/3/U
Project	2 credits	5/4/3/U
Laboratory	1 credit	G/U

Course literature

Please note that changes may be made to the reading list up until eight weeks before the start of the course.

Title: Advanced Surface Technology vol 1 and 2
Author: Per Møller & Lars Pleth Nielsen
Publisher: M&N, Denmark, 2012
ISBN: 9788792765246 and 9788792765253

Supplementary reading
Hand-outs, Journal papers indicated during the course