KURSPLAN
Ytteknik, 7,5 högskolepoäng

Surface Technology, 7.5 credits

Kurskod:	TYTS22	**Utbildningsnivå:**	Avancerad nivå
Fastställd av:	VD 2021-03-01	**Utbildningsområde:**	Tekniska området
Reviderad av:	Utbildningschef 2022-02-24	**Ämnesgrupp:**	MA2
Gäller fr.o.m.:	2023-01-01	**Fördjupning:**	A1F
Version:	2	**Huvudområde:**	Produktutveckling

Lärandemål

After a successful course, the student shall;

Kunskap och förståelse
- 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.

Färdighet och förmåga
- 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 coating technologies from various perspectives identifying potential and limitation.

Värderingsförmåga och förhållningssätt
- demonstrate the ability to a identify the industrial needs and set 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.

Innehåll

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 for manifold applications.

The course includes the following elements:
• Surface degradation, corrosion, wear
• Fundamentals of chemistry and electrochemistry
• Pre-treatment
• Electroplating
• Thermal spray, laser-cladding, build-up welding
• Hot-dip coatings
• Enamel
• Organic coatings
• PVD, CVD
• Conversion coatings
• Thermal/mechanical/chemical surface treatment
• Regulations, safety, and sustainability in surface-related processing

Undervisningsformer

Lectures, labs, project work.

Undervisningen bedrivs på engelska.

Förkunskapskrav

Passed courses at least 90 credits within the major subject Mechanical Engineering, 15 credits Mathematics, and completed course in Thermodynamics, 7,5 credits, proof of English proficiency is required (or the equivalent).

Examination och betyg

Kursen bedöms med betygen 5, 4, 3 eller Underkänd.

The final grade for the course is based upon a balanced set of assessments.
The final grade will only be issued after satisfactory completion of all assesments.

Poängregistrering av examinationen för kursen sker enligt följande system:

Examinationsmoment	Omfattning	Betyg
Examination	4 hp	5/4/3/U
Laborationer och inlämningsuppgifter	3,5 hp	5/4/3/U

Kurslitteratur

The literature list for the course will be provided 8 weeks before the course starts.

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