



KD2350 Surfaces, Colloids and Soft Matter 7.5 credits

Ytor, kolloider och mjuka material

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for KD2350 valid from Autumn 2023

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering, Chemistry and Chemical Engineering

Specific prerequisites

Bachelor's degree in engineering or in sciences including 50 credits in chemistry or chemical engineering, English B/6.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The aim of the course is to provide a broad, fundamental basis in surface and colloid chemistry and its applications.

After completing the course, a student should be able to:

- Explain aspects of surface, colloid and soft matter chemistry.
- Apply surface and colloid science on interfacial phenomena.
- Communicate and present surface and colloid science and their relevance in sustainable development.

Course contents

Principles of Surface and Colloid Science

Thermodynamics of surface tension, adsorption and interacting surfaces, as well as the relevant experimental approaches.

Capillarity

Electrostatics of interfaces and titration of surface charge

Electrokinetic phenomena

Surface forces: double layer forces, van der Waals forces, steric forces, hydration forces and colloidal stability

Stabilising dispersions

Adhesion

Wetting, including superhydrophobicity.

Applications of surface chemistry, with focus on paper industry, flotation and cleaning

Adsorption: From gases and liquids, including polymers, polyelectrolytes and the formation of polyelectrolyte complexes. Solution behaviour of polyelectrolytes.

Surface modification

Surfactant properties and association to micelles, vesicles, liquid crystals and biomembranes.

Emulsions, microemulsions and foams.

Gels

Examination

- LAB1 - Laborations, 2.0 credits, grading scale: P, F
- TEN1 - Written exam, 5.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

Laboratory Work (LAB1; 2 credits)
Examination (TEN1; 5.5 credits)

Final grade will be the same as the grade of the examination.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.