Reg No: KEAD52/20212

Faculty of Health, Science and Technology
Chemistry

Syllabus

Surfaces, Interfaces and Colloids D

Course Code:	KEAD52
Course Title:	Surfaces, Interfaces and Colloids D *Ytor, gränsskikt och kolloider D*
Credits:	7.5
Degree Level:	Master's level
Progressive Specialisation:	Second cycle, has only first-cycle course/s as entry requirements (A1N)

Major Field of Study:
KEA (Chemistry)
KTA (Chemical Engineering)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2021-01-28, and is valid from the Autumn semester 2021 at Karlstad University.

Prerequisites
Admission to the Master programme in Chemical Engineering at Karlstad University with 150 ECTS credits completed in the programme, or registration on 90 ECTS credits in Chemistry with at least 60 ECTS credits completed, plus upper secondary level Swedish 3 or Swedish as a Second Language 3 and English 6, or equivalent.

Learning Outcomes
The aim of the course is for students to acquire basic knowledge of the physical chemistry of surfaces, interfaces, and colloids. The aim of the course is also to give students the opportunity to practice modern presentation skills in the presentation of a completed project.

Upon completion of the course, students should be able to:

1. give an account of basic theories relating to the physical chemistry of surfaces, interfaces, and colloids,
2. apply relevant theories to explain colloidal and surface phenomena,
3. calculate physical parameters for colloidal and surface systems, relating these to presented theories,
4. study colloidal and surface phenomena within the scope of a project and given time limits,
5. give an account of and explain current issues pertaining to the physical chemistry of surfaces, interfaces, and colloids, and
6. use and evaluate scientific literature in the assessment of empirical findings.

Content
The course comprises two components: a theoretical component and a project. The theoretical component is roughly equivalent to four weeks of full-time study, while the project component is roughly equivalent to one week of full-time study. Instruction in the two components may be integrated and parallel.

Theoretical component
Instruction is in the form of lectures, seminars, and exercises. The lectures present the course content, and the exercises provide an opportunity for students to apply the presented theories in practice. The seminars offer students concrete opportunities to discuss the course content.
The course presents basic theories of surfaces, interfaces, and colloids in terms of their physical chemistry, as well as surface tension activities, surface activity interactions, electrostatics, adsorption, adhesion, colloidal stability, emulsions, microemulsions, foaming, association colloids, solubility, humidification and dissipation, friction and lubrication, and aerosols.

Project component
Students complete a project related to scientific literature in the field. The project can be either experimental or a literature review. In connection with the project, the course offers an introduction to software and technology used in reporting graphic material and producing so-called poster presentations or folders.
The project component may include a study visit at a company, research institute, or similar. Students may be requested to meet the cost of the study visit, in full or in part.

Reading List
See separate document.

Examination
The theoretical part of the course is assessed on the basis of a take-home exam including hand-in essay assignments and calculation exercises. The project is assessed on the basis of a graphic presentation and an oral presentation. All examination is individual.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades
One of the grades Pass with Distinction (VG), Pass (G), or Fail (U) is awarded in the examination of the course. For Engineering students, one of the grades Pass with Distinction (5), Pass with Some Distinction (4), Pass (3), or Fail (U) is awarded.

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate
A course certificate will be provided upon request.

Additional information
The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.

Students may be requested to meet the cost of the study visit, in full or in part.

The course KEAD52 cannot be included in the same degree programme as the courses KEGC51, KEAD51, KEGC52, KEGCY0 or KEADY0.