

SYLLABUS

Water Chemistry 7.5 credits K0006K

Vattenkemi

Course syllabus admitted: Autumn 2023 Sp 1 - Present

**DECISION DATE
2023-02-13**

Water Chemistry 7.5 credits K0006K

Vattenkemi

First cycle, K0006K

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Kemi	Chemistry

Main field of study

Chemical Engineering

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and Chemical Principles (K0016K)

Selection

The selection is based on 1-165 credits.

Course Aim

After taking the course, you should be able to - formulate and handle equilibrium systems; smaller systems on paper and more complicated by the use of calculation programs. - predict and when data is available calculate the displacement of the equilibrium by changes in temperature, pressure, ionic strength and composition. - interpret and in some cases construct equilibrium diagrams. You should have an understanding of the possibilities and limitations in using equilibrium modeling, for the regulation of the composition of various natural and industrial water types. The principles for water treatment and chlorines reactions in water shall be known, as well as the basis for chemical reaction kinetics. When relevant, identify and propose actions to maintain a sustainable development. You should also further improve your communicative skills, especially with focus on producing well-structured and formulated written reports

Contents

Part 1: A short introduction to the characteristics of water and water types. Then the activity concept is discussed with focus on the dependence of the ionic strength, as well as the influence of changes in the temperature and other thermodynamic dependencies. Redox-, complex-, solubility- and distribution equilibria and a short introduction to gas equilibria. will finalise part 1.

Part 2: Acid-base equilibria, including heterogeneous equilibria, alkalinity, water purification and reaction kinetics. An introduction to surface complexation equilibria and also examples of the handling of industrial and environmental systems. Different equilibrium principles are studied with the use of diagrams and mathematical calculations. The influence of temperature, ionic strength as well as the alkalinity concept will be discussed. The theory is applied in laboratory experiments. A computer simulation is included in the laboratory exercise item.

Realization

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

The teaching consists of lectures and laboratory exercises. The first lecture is compulsory as well as the laboratory exercises.

A study visit may be arranged during the course.

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. Graded exams and participation in study visits, when arranged for part 2. Approved lab.exercises, simulations and well-structured and formulated written reports. The final grade for the course will be derived from the results from the written exams. Students who have failed an examination on five occasions will not be allowed further resits.

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.

Remarks

Syllabus can be downloaded from LTUs learning platform

Overlap

The course K0006K is equal to KGK013

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0005	Laboratory work	U G#	1.5	Mandatory	A14	
0006	Written exam part 1	G U 3 4 5	3	Mandatory	A16	
0007	Written exam part 2	G U 3 4 5	3	Mandatory	A16	

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 Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2023-02-13

Syllabus established

Course plan approved by the Department of Chemical Engineering and Geosciences 2007-02-28.