



Faculty of Health, Science and Technology
Chemistry

Syllabus

Chemistry Preparatory B

Course Code:	KEBX23
Course Title:	Chemistry Preparatory B <i>Kemi Bas B</i>
Credits:	7.5
Degree Level:	Preparatory
Progressive Specialisation:	()

Major Field of Study:

Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2019-09-09, and is valid from the Spring semester 2020 at Karlstad University.

Prerequisites

Chemistry Preparatory A, 7.5 ECTS credits, or equivalent

Learning Outcomes

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

1. give an account of and predict the influence of different factors on reaction velocity and equilibrium,
2. perform calculations of different types of equilibrium such as redox equilibrium, proteolytic equilibrium, and buffer equilibrium,
3. give an account of several element classes in organic chemistry, their functional groups, and different types of isometry,
4. identify a few reaction mechanisms and explain how and why reactions occur for different types of organic reactions,
5. identify and give examples of some common biologically active molecules,
6. describe the basic traits of human metabolism at the molecular level,
7. describe the basic traits of genetic information,

8. describe and give examples of several different methods in analytical chemistry, such as titrimetric, spectrophotometric, and chromatographic methods, and
9. plan and carry out simple chemical experiments and interpret and present the results within given time limits.

Content

Learning outcomes 1 and 2: Reaction velocity, different types of equilibrium, equilibrium constants, calculating equilibrium, Le Chatelier's Principle, protolysis and protolytes, pH, pOH, acid-base constants, acid-base titration, neutralisation, different buffer systems.

Learning outcomes 3 and 4: Organic element classes and their functional groups (hydrocarbons, alcohols, phenols, aldehydes, ketones, triols, ethers, esters, amines, carboxylic acids, and nitro compounds), rational nomenclature, isomer, oxidation of alcohols and a few other reaction mechanisms.

Learning outcome 5: Lipids (fats, phospholipids, steroids), carbohydrates (mono-, di-, and polysaccharides), amino acids, and nucleotides.

Learning outcomes 6 and 7: Protein structure and function, enzyme activity, catabolic reactions (glycolysis, beta oxidation, transamination and deamination, the citric acid cycle, the electron transport chain), the structure and function of nucleic acid.

Learning outcome 8: Qualitative and quantitative analysis, spectrophotometry (UV/VIS spectrophotometry, IR spectroscopy, mass spectrometry, NMR), pH meter, chromatography (size exclusion chromatography, affinity chromatography, thin layer chromatography, liquid chromatography, gas chromatography).

Learning outcome 9: Laboratory work including preparation, implementation, interpretation, and presentation of results in accordance with instructions.

Reading List

See separate document.

Examination

Assessment is based on a written exam at the end of the course. Laboratory sessions are mandatory and presented orally or in writing.

If students have a decision from Karlstad University entitling them to special pedagogical 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 Fail (U) or Pass (G) is awarded in the examination of the course (Ref.no C2018/824).

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 course KEBX21 cannot be included in the same degree programme as the course KEBX23.

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