



# KD1060 Molecular Structure 7.5 credits

## Molekylär struktur

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 KD1060 valid from Autumn 2010

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Chemistry and Chemical Engineering, Technology

## Specific prerequisites

Completed upper secondary education including documented proficiency in English corresponding to English A. For students who received/will receive their final school grades after 31 December 2009, there is an additional entry requirement for mathematics as follows: documented proficiency in mathematics corresponding to Mathematics A.

And the specific requirements of mathematics, physics and chemistry corresponding to Mathematics E, Physics B and Chemistry A.

## Language of instruction

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

## Intended learning outcomes

This course should provide the student with a basic understanding of chemical bonding, intermolecular interactions and molecular spectroscopy, and an introduction to modern methods for determination of the structure and properties of molecules.

## Course contents

- Elementary quantum mechanics
- Electronic structure of atoms, atomic orbitals, the basis for the periodic system
- Chemical bonding, molecular orbitals, hybridization, singlet and triplet states, applications of chemical bonding in organic, inorganic, and biological molecules
- Background to modern quantum chemical methods
- Intermolecular interactions, gases-liquids-liquid crystals-solids, supermolecular structures, e.g. biomembranes
- Spectroscopical methods such as IR, Raman, UV/VIS, NMR, MS, ESCA
- Diffraction methods
- Structural chemistry with student project (1p)

Most of the experimental methods and the computational quantum chemistry are exemplified by laboratory and/or computer exercises.

## Course literature

Atkins and de Paula  
Atkins' Physical Chemistry, 9th  
Oxford University Press 2010  
ISBN-13: 978-0-19-954337-3

## Examination

- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F
- PRO1 - Project, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 4.5 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

Examination 4,5 credits

Laboratory work 1,5 credit

Project work 1,5 credit

## 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.