



# KD2320 Spectroscopic Tools for Chemistry 9.0 credits

## Spektroskopiska verktyg inom kemi

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Course syllabus for KD2320 valid from Autumn 17

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

**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

### Intended learning outcomes

The aim of the course is to develop the knowledge and the understanding of nuclear magnetic resonance spectroscopy (NMR), mass spectrometry (MS), infrared (IR) and Raman spectroscopies in order to elucidate molecular structures and dynamics.

After completion of the course the student should be able to

- describe the principles of NMR, MS, IR and Raman methods with special regard to their advantages and limitations,
- analyze the NMR, MS, IR and Raman spectra, interpret and use the relationship between the spectral parameters and the molecular structure,
- make a proper choice and strategy for analysing and solving structural problems,
- recognize and explain the effects of molecular dynamics such as chemical exchange in the spectra.

### Course main content

Basic principals of nuclear magnetic resonance spectroscopy (NMR), mass spectrometry (MS), infrared (IR) and Raman spectroscopies. Interpretation of spectra to elucidate molecular structures and dynamics.

The course contains lectures, tutorials and laboratory practices. Tutorials will supplement the lectures and a significant amount of time will be spent on solving problems and answering questions. Regular homework projects of gradually increasing complexity provide the students with working knowledge of the topics.

### Language of instruction

Language of instruction is specified in the course offering information in the course and programme directory.

### Eligibility

**Admission requirements for programme students at KTH:**

At least 150 credits from grades 1, 2 and 3 of which at least 110 credits from years 1 and 2, and bachelor's work must be completed, within a programme that includes:

75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding.

***Admission requirements for independent students:***

75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding. Documented proficiency in English corresponding to English B.

**Literature**

On-line literature recommended by the lecturers

**Examination**

- LAB1 - Laboratory Work, 4.0 credits, grading scale: P, F
- TEN1 - Examination, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Home Assignments, 1.0 credits, grading scale: P, F

**Requirements for final grade**

Laboratory work (LAB1; 4 credits)

Examination (TEN1; 4 credits)

Exercises and Home Assignments (ÖVN1; 1 credits)

The final grade will be grade of the examination