



FCK3311 NMR Spectroscopy and imaging – basic principles 4.5 credits

NMR-spektroskopi och -avbildning – grundläggande principer

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

Establishment

Course syllabus for FCK3311 valid from Spring 2020

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Eligible for studies at the third-cycle level.

Language of instruction

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

Intended learning outcomes

After completing the course, the student should be able to

- explain the basic principles for NMR spectroscopy and imaging
- explain how the different NMR parameters depend on and reflect molecular properties.
- use the above listed knowledge to plan, perform and evaluate a laboratory project within the subject area, in group (or individually, depending on the number of participants) including to perform a smaller literature study, and present the laboratory project in a written report and perform an opposition on another laboratory project in the course

Course contents

The vector model of NMR spectroscopy

- rotating frame
- radiofrequency pulses and their effect
- the time dependent signal
- Fourier transformation (FT)
- NMR relaxation
- simple pulse sequences and instrumentation
- the effect of magnetic field gradient
- 2D FT NMR and MRI

Examination

- RAP1 - Report, 3.0 credits, grading scale: P, F
- LAB1 - Laboratory project, 1.5 credits, grading scale: P, 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Approved exam (TEN1; 3 ECTS)

Approved presentation of the laboratory project (LAB1; 1.5 ECTS)

Other requirements for final grade

The student should be able to fulfil all parts of the objectives on both a general and basic level, and on a detailed level, and with both width and depth. The student should also be able to use this knowledge to set up NMR experiments to gain insight to particular problems, and relate this to own research.

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.