

NMR, advanced course, 10 credits

(NMR, påbyggnadskurs; 10 poäng)

The syllabus was approved by the board of the Faculty of Mathematics and Natural Sciences on *dag, månad*, 1999-06-02.

1. Entrance qualifications

The entrance requirements are all of the following: (i) the general admission requirements for higher education, (ii) 40 credits in Basic Chemistry including at least 5 credits in Physical Chemistry, or 40 credits in Basic Physics, and (iii) at least 10 credits in Mathematics, or equivalently.

2. Aim

The course covers (i) the basic theoretical background of nuclear magnetic resonance (NMR), including time-dependent quantum mechanics, (ii) the function and operation of an NMR spectrometer, (iii) contact with several applications of nuclear magnetic resonance, including NMR imaging, biomolecular structural determination, and solid-state NMR.

3. Contents

The course consists of two items, of 5 credits each.

Part 1

- Theoretical background. Time-dependent quantum mechanics and spin dynamics.
- The NMR spectrometer and how it works.
- Principles of NMR imaging.

Part 2

- More spin dynamical theory.
- Principles of Spin Relaxation.
- Biomolecular structure determination by NMR. Theory and practice.
- Introduction to solid-state NMR and liquid-crystal NMR.

4. Teaching

Lectures, calculation exercises, laboratory work, study visits.

Participation in the calculation exercises and laboratory work is compulsory (the instructors may allow other arrangements to be made in special circumstances).

5. Examination

The course includes one written examination. The laboratory work must also be approved in order to pass the course.

The grade scale is 'fail', 'pass' and 'pass with distinction'.

A student who fails is entitled to re-examination.

A student who passes cannot request re-examination in an attempt to obtain a higher grade.

Students who have failed twice are entitled to request that another teacher evaluate their performance. Such a request should be directed to the departmental board of Physical, Inorganic and Structural Chemistry.

6. Literature

Course books will be set by the departmental board of Physical, Inorganic and Structural Chemistry.

7. Other information

This course may not be included in the degree of Bachelor or Master of Science together with the course "NMR and Quantum Chemistry", 10p, (KE3500), or "NMR", 5p (KE 3780).