



CM209V Magnetic Resonance Imaging Sequences 3.0 credits

Magnetresonanstomografi-pulssekvenser

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 CM209V valid from Autumn 2024

Grading scale

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

Education cycle

Second cycle

Main field of study

Medical Engineering

Specific prerequisites

Completed degree project 15 credits, 15 credits in mathematics, 15 credits in physics, 6 credits in programming. Alternatively, 1 year of professional experience in medical technology, technical physics, electrical engineering, or computer science. English 6/B.

Language of instruction

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

Intended learning outcomes

After successful completion of the course the students should be able to

- describe the theory behind the most used magnetic resonance imaging (MRI) pulse sequences used in clinics and research and their applications.
- describe the most common image artifacts associated with MRI and how they can be reduced/avoided during imaging.

In order to:

- understand the scope of use and limitations of different MRI pulse sequences.
- select the most appropriate MRI pulse sequences for specific applications.
- have a broad knowledge base that can ease understanding literature in the field.

Course contents

The course is divided into two modules:

- Basic MRI sequences: gradient echo, spin echo, inversion recovery, acceleration techniques.
- Advanced MRI sequences: BOLD, diffusion, phase contrast, elastography, spectroscopy, Dixon, perfusion, thermometry, magnetization transfer, susceptibility imaging.

Examination

- TEN1 - Written exam, 3.0 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.

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.