

Physical principles of magnetic resonance imaging



Lecturer
Thierry METENS (Coordinator)

Course mnemonic
PHYS-H409

ECTS credits
3 credits

Language(s) of instruction
English

Course period
Second term

Course content

Magnetic resonance imaging

Basis of nuclear magnetic resonance and Bloch equations. MRI Image and contrast formation. Fourier MRI. Relationship between sampling in the Fourier space and features in the final image. Fourier sampling schemes Signal to noise ratio and artefacts in MRI. MRI of coherent and incoherent motions, angiography, diffusion, fonctionnal MRI, Echo train imaging. Parallel imaging Simultaneous multislice imaging Compressed sensing. Practical demonstrations in Erasme Hospital

Objectives (and/or specific learning outcomes)

[[table]]

Teaching method and learning activities

Ex cathedra and practicals

Contribution to the teaching profile

This teaching unit contributes to the following competences:
Understanding the physical basis of image formation in MRI
Being able to use MRI for human, animal or in vitro imaging
being able to further develop MRI sequences and methods.

References, bibliography and recommended reading

see slides and syllabus

Other information

Contact(s)

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Evaluation method(s)

Other

Evaluation method(s) (additional information)

MRI=Oral exam

Programmes

Programmes proposing this course at the Brussels School of Engineering

MA-IRCB | Master of science in Biomedical Engineering | finalité Professional/unit 2 and MA-IRPH | Master of science in Physical Engineering | finalité Professional/unit 2