Basic MRI Physics

ERASMUS Course on Magnetic ResonanceImaging

15 - 19 September 2025

Universidad Politécnica de Madrid

Course Objectives

This one-week module is part of the <u>ERASMUS Course on Magnetic Resonance</u> Imaging.

It is meant to provide a solid understanding of the basic principles underpinning MRI. Topics related to nuclear magnetic resonance, image encoding, relaxation, spin-echo and gradient-echo imaging, fast imaging, instrumentation, site planning, specialized MRI (perfusion, diffusion, flow, functional MRI).

Formal lectures are intertwined with question&answer and self-teaching sessions.

The course is targeted at diagnostic imaging professionals including fields of Clinical Radiology, Medical Physics, Radiography, Electroradiology and staff/students from clinical and scientific facilities. **No previous knowledge of MR principles is assumed**.

The limit of 30 participants will be followed, in the order of payment.

Organizer

Andres Santos (<u>Biomedical Imaging Technology Lab</u>) Universidad Politécnica de Madrid & CIBER-BBN

Faculty

- Dr. Peter Van Schuerbeek (University Brussels, BE)
- Dr. Stephen Nicholas (University Dundee, UK)
- Dr. Stephen Gandy (University Dundee, UK)
- Dr. Stephen Sawiak (University Cambridge, UK)
- Dr. Cristina Santa-Marta (Universidad Nacional Educación a Distancia, ES)
- Dr. Maria Jesus Ledesma-Carbayo (Universidad Politécnica de Madrid, ES)

Venue: <u>ETSI Telecomunicación</u>. Avenida Complutense 30. Madrid (Spain). **Building** 'C', ground floor.

See map

Contact: Eva Rojas ETSI Telecomunicación E-28040 Madrid (Spain) <erojas@die.upm.es>

Language: The official course language is English.

Certificate: A certificate will be awarded to the successful candidates.

Program

Monday 15 Sep.	Tuesday 16 Sep.	Wednesday 17 Sep.	Thursday 18 Sep.	Friday 19 Sep.
9:00 Registration	Basic Spin Echo Imaging Dr. S. Sawiak, Cambridge	Basic Gradient Echo Imaging Dr. P. Van Schuerbeek, Brussels	Functional MRI Dr. S. Sawiak, Cambridge	MR Spectroscopy Dr. C. Santa-Mart Madrid
10:00 Background physics and mathematics Dr. P. Van Schuerbeek, Brussels	Self Evaluation Self Teaching Coffee	Self Evaluation Self Teaching Coffee	Self Evaluation Self Teaching Coffee	Examination and course evaluation
10:45 Basic NMR Dr. P. Van Schuerbeek, Brussels	Spin Echo Imaging in practice Dr. S. Sawiak, Cambridge	Gradient Echo Imaging in practice Dr. P. Van Schuerbeek, Brussels	Diffusion & perfusion Dr. S. Sawiak, Cambridge	Coffee
11:45 Self Evaluation Self Teaching	Self Evaluation Self Teaching	Self Evaluation Self Teaching	Self Evaluation Self Teaching	Certificates & Farewell
12:15 Lunch Break	Lunch Break	Lunch Break	Lunch Break	
13:15 Imaging encoding Dr. P. Van Schuerbeek, Brussels	Relaxation times and contrast Dr. S. Gandy, Dundee	Fast and ultra-fast imaging Dr. S. Nicholas, Dundee	Flow effects and angiography Dr. S. Gandy, Dundee	
14:15 Self Evaluation Self Teaching	Self Evaluation Self Teaching	Self Evaluation Self Teaching	Self Evaluation Self Teaching	
15:00 Instrumentation and site-planning Dr. S. Nicholas, Dundee	Safety and quality assessment Dr. S. Gandy, Dundee	Artefacts Dr. S. Nicholas, Dundee	Cardiac imaging Dr. S. Gandy, Dundee	
16:00 Self Evaluation Self Teaching	Self Evaluation Self Teaching	Self Evaluation Self Teaching	Self Evaluation Self Teaching	
17:00 Welcome drink	Visit to MRI	_		

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		facility Dr. M.J. Ledesma- Carbayo, Madrid			
20:30		S	Social Dinner		

Registration and fees:

First you should fill the registration form on the organization web site

Fees including course materials, lunches, coffee breaks and social dinner: **750 € full fee, reduced to 550 € for certified students**. To qualify for the reduced fee a letter signed by the Head of Department has to be sent to Eva Rojas by email <erojas@die.upm.es>.

Special food must also be requested in advance.

Payment in Euros should be made payable to the account:

Account owner: Fundetel

• Bank: Abanca (Address: Av. Reina Victoria 58. E-28003 Madrid. Spain)

• IBAN: **ES58 2080 5604 6430 4001 1038**

• SWFIT: CAGLESMMXXX

• Reference: **EMRI-25** [your name]

The reservation is not confirmed until the payment is received.

Deadline for payment: 29 August 2025.

Last modified on 31 Jan. 2025 by andres@die.upm.es