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***Module Descriptor – Advanced Safety in Magnetic Resonance Imaging***  
***(20 ECTS)***

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The aim of this module is to build on the basic safety concepts of hardware and the electromagnetic fields used in magnetic resonance imaging (MRI). The safety and physical aspects of the radiofrequency electromagnetic field, static magnetic field and gradient magnetic field will be explored in detail, with in-depth correlation to clinical practice. Emphasis will be placed on risk assessment of passive and active implants. This module will provide MRI personnel with the knowledge and skills required to be confident decision makers, dealing with issues that arise in the day to day running of the MRI unit to the level of an MRI safety officer. It will enable them to be key members and decision makers on the MRI safety committee within their organisation.

### **Learning Outcomes**

On completion of this module, the student will

- understand and analyse the advanced physical concepts of magnetism and magnetic properties of matter.
- understand and discuss the issues surrounding emergent situations in the MRI unit.
- Discuss and evaluate the risks associated with occupational exposure to electromagnetic fields for workers in MRI.
- understand the advanced physics associated with the static magnetic field, the radiofrequency magnetic field and the gradient magnetic field.
- Understand and discuss the risks and risk minimisation methods associated with each electromagnetic field.
- be able to implement scanning strategies to reduce risks associated with electromagnetic fields.
- assess both passive and active implants for risks within the MRI environment.
- discuss the advances in MRI contrast agents and the science behind both European and international guidelines.

- devise and implement standard operation procedures (SOP's) to ensure safe work practices in MRI.
- assess and implement safety zoning with MRI departments

#### Timeline (may be subject to minor changes)

Week Number	Event	Time & Date	Duration
Week 7	Live session	14.00 CET, Tuesday, Feb 11	3-4 hours
Week 10	Assignment 1 Submission	12.00 CET, Friday, March 7	
Week 9	Live session	14.00 CET, Tuesday, Feb 25	2 hours
Week 12	Live session	14.00 CET, Tuesday, March 18	2 hours
Week 14	University dependant sessions	Coaching/Check in from own university	Up to each university.
Week 15	Assignment 2 Submission	12.00 CET, Monday, April 7	
Week 15	Live Session	14.00 CET, Tuesday, April 8	2 hours
Week 19	Live Session	14.00, CET, Tuesday, May 6	2-3 hours
Week 21	Live Session	14.00 CET, Tuesday, May 20	2 hours
Week 21	Assignment 3 Submission	12.00 CET, Wednesday, May 21	

#### How will I learn?

Type of Learning	Hours
Pre recorded Online Lectures	150
Live Lectures and discussion groups	20
Autonomous Student Learning	100
Clinical Hours in MRI	100
Formative assessment tasks	20
Specified Learning Activities	110
<b>Total Workload</b>	<b>500</b>

Note: Prerecorded lectures will be available to the student on the Virtual Learning Environment (VLE) platform of your university and will be self-paced. Live lectures and discussion groups will be delivered online through the VLE of your University.

**How will I be assessed?**

<b>Assessment Type</b>	<b>Weighting</b>
Assignment 1: Assignment based assessment on scenarios	20%
Assignment 2: Critique on specified topic in own department	30%
Assignment 3: Assignment based on the assessment of specified implant	50% (Must Pass)