

Module Details	
Module Title	Magnetic Resonance Imaging
Module Code	RAD7008-C
Academic Year	2022/3
Credits	30
School	School of Allied Health Professions and Midwifery
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Lectures	36
Online Lecture (Synchronous)	13
Online Lecture (Asynchronous)	15
Interactive Learning Objects	23
Tutorials	6
Online Tutorials (Synchronous)	2
Directed Study	100
Independent Study	104
Project Supervision	1

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims
(1) To enable the student to gain a comprehensive understanding of the physical principles and instrumentation in Magnetic Resonance Imaging (MRI). (2) To develop the student's understanding of complex data acquisition techniques, image formation and collection using classical and quantum mechanics. (3) To develop the student's ability to implement Quality Assurance measures in MRI.

Outline Syllabus

The student will gain knowledge in;

- (01) Generation of MRI Signal and Relaxation.
- (02) Image Production.
- (03) Pulse Sequences and Weighting.
- (04) Contrast and Image appearances.
- (05) Parameters and Optimisation.
- (06) Tissue Suppression.
- (07) Artefacts and Contrast agents.
- (08) Acceleration Techniques.
- (09) MRI Hardware and Instrumentation.
- (10) Advanced MRI principles.
- (11) MRI Techniques and Protocols.
- (12) MRI Safety and Guidelines.
- (13) Critical appraisal of relevant literature.
- (14) Effective communication and presentation skills.

Learning Outcomes

Outcome Number	Description
01	Critically evaluate the physical principles of magnetic resonance imaging (MRI).
02	Critically appraise MRI applications and principles of quality assurance and control, applied to MRI Image acquisition and Interpretation.
03	Demonstrate in depth understanding and originality in the application of modern MRI systems engineering, instrumentation, and associated technologies.
04	Critically analyse advanced physical concepts and developments in MRI.
05	Critically appraise relevant research and literature, to evaluate and effectively communicate complex issues in a systematic and creative manner.

Learning, Teaching and Assessment Strategy

The delivery of this module incorporates lectures delivered by Faculty experts with support from the technical and clinical fields. Students will be exposed to current MRI technology and its applications in clinical practice, encouraging reflection on their existing practice.

Tutorials will be used to facilitate peer learning and directed study based on appraising up to date literature and practice, to stimulate the students learning in the classroom or virtually. Technology will be used to support and facilitate sharing and collaboration in problem solving.

The teaching and assessment strategy will develop the students' understanding of the research methodologies to critically evaluate the evidence base around the related subject matter. In addition, there will be opportunities to share learning with others through peer discussion and formative feedback on selected topics, in the academic environment.

Achievement of the learning outcomes will be demonstrated through the completion of:

- (1) a seminar presentation allowing demonstration of their underpinning knowledge base and critical thinking (learning outcomes 3, 4, 5); and
 - (2) a formal examination (learning outcomes 1, 2) based on the underlying physical principles and technologies.
- The student will engage with formative assessments through facilitated peer discussions and mock exam questions in preparation for their summative assessments.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Presentation	20 minutes Presentation (PASS AT 40%, MUST PASS)	30%
Summative	Computerised examination	120 minutes Written examination with use/sight of computer (PASS AT 40%, MUST PASS)	70%
Formative	Self and Peer Assessment	Tutor facilitated peer discussions	N/A
Formative	Classroom test	Mock exam questions and marking guide	N/A

Reading List
To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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