

Module Specification

Module Summary Information

1	Module Title	Diagnostic Technology and Physics
2	Module Credits	40
3	Module Level	4
4	Module Code	RAD4046

5	Module Overview
<p>Rationale</p> <p>This core module is essential to enable your understanding of the theory and practical applications of physics in the context of radiography or radiotherapy. Radiation physics and the safe and legal use of ionising radiation is an essential aspect of the radiation disciplines. It involves the underlying principles of the nature of matter and associated principles and how that relates to radiation production and attenuation, its application to imaging and therapeutic modalities. You will develop your understanding of the underpinning aspects of physics related to radiography and radiotherapy. That will form the basis for developing your understanding of the production and attenuation of ionising radiation and its effects. You will also gain a comprehensive body of knowledge of radiation protection as specified in current legislation which will help develop your understanding of the necessity for the safe use of ionising radiation technologies in health care practice.</p> <p>It is essential that this module content is covered at the beginning of the degree programme to ensure that the use of radiation, the regulation and safety aspects are covered before students undertake any substantive clinical practice.</p> <p>The second part of this module enables you to develop your understanding of the principles of image production and management.</p> <p>Alignment with Philosophy and Aims</p> <p>This module will provide you with a 'core of knowledge' of physics and radiation protection and therefore prepares you for practice as a student and as an employable health care worker in a radiation environment. You will have the necessary knowledge to be able to work within your scope of practice in an interdisciplinary environment to ensure safe imaging and/or treatment management of the patient. You will acquire and develop knowledge to correctly apply the current legislation relating to the use of ionising radiation. On successful completion, this module will have developed your understanding of the applications to safe clinical practice and will underpin studies at academic levels 5 and 6 and beyond into employment as a radiographer. The content has applications to safe practice in radiography / radiotherapy department not only in the UK but also globally.</p> <p>Learning and Teaching Strategy</p> <p>You will be taught this module through a variety of methods. This includes lectures, tutorials and the provision of a range of resources via the module Moodle site. These will include documents, resource links, articles, quizzes and exercises, audio files of the session content and example assessment questions. It is important that you attend each session as the complexity will build throughout the module, building upon the previous sessions. The first part of the module will deal with underpinning concepts that are applicable to Diagnostic Radiography, Radiotherapy and Ultrasound students and so</p>	

will be taught jointly. For the second part of this module you will be directed to acquire information about the technologies you may encounter to develop your understanding of the principles of image production and management.

Assessment Strategy

The assessment for this module will be via a two written examinations. The reason for this is that it is essential to assess your breadth of understanding and knowledge and your recall of the principles of physics associated with radiography and essential for safe clinical practice.

6	Indicative Content
	Atomic Structure
	Electricity and Magnetism
	Electromagnetic Radiation
	X-Ray Production
	X-Ray Spectrum
	X-Ray Attenuation
	X-Ray Interactions
	Inverse Square Law
	Radiation Units
	Radiobiological effects
	Radioactivity
	Radioactive Emissions
	Radiation Protection
	Radiation Regulations IRR 17 & IRMER 2018
	Measurement of Radiation; chambers, diodes and TLDs
	Tools of our trade Control Panels –“Positional” (?) Imaging Equipment: Imaging Geometry, Grids and use of AED DAP and DRL’s
	PACS
	Principles of CT
	Dental and Mammographic Equipment
	Principles of MRI
	Principles of US
	Principles of RNI
	Quality Assurance

7	Module Learning Outcomes
	On successful completion of the module, students will be able to:
	1 Explain your understanding of the underpinning physics concepts associated with radiography.

	2	Demonstrate knowledge and understanding of the applications of the effects of ionising radiation, methods of measurement and the current ionising radiation regulations essential to safe practice and radiation protection.
	3	Demonstrate knowledge and understanding of image production and management within radiographic practice.
	4	Explain your understanding of the safe use of equipment and technology in image production and management within radiographic practice.

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1,2		X (exam 1)	
3,4		X (exam 2)	

9	Breakdown Learning and Teaching Activities	
Learning Activities	Hours	
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable	70	
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE	60	
Private Study (PS) includes preparation for exams	270	
Total Study Hours:	400	