Module Details

Module Title	Fundamentals of radiation and radiation safety
Module Code	RAD4501-B
Academic Year	2024/5
Credits	20
School	School of Allied Health Professions and Midwifery
FHEQ Level	FHEQ Level 4

Contact Hours

Type	Hours
Lectures	11.5
Placement	9 (of which 4.5 are virtual simulated placement activities)
Directed Study	3
Independent Study	167.5
Seminars	9

Availability

Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims

This module introduces students to physical principles of ionising and non-ionising radiation and its use and production within medical imaging environments. Effective radiation protection measures and legal and professional responsibilities of radiographers will be emphasised.

Outline Syllabus

The fundamental physical principles underpinning diagnostic radiography including the electromagnetic spectrum, atomic structure, and ionisation.
Production of radiation appropriate for medical imaging.
Bremstrahlung and characteristic radiation processes will be explored with a focus on the impact of x-ray tube design, beam filtration, source-to-detector-distance and exposure factors on radiation dose.
The properties of non-ionising and ionising radiation including stochastic and deterministic effects of ionising radiation in humans relative to radiation dose.
Radiation protection of self, patients and public through room design, optimisation, protective equipment and quality assurance, with a focus on IRR and IR(ME)R regulations content and implications.
Role of human factors in radiation safety, errors, and incident reporting.

Learning Outcomes

Outcome Number	Description
01	Describe the electromagnetic spectrum and its application to diagnostic imaging.
02	Explain the design of X-ray tubes and the X-ray production process.
03	Apply the principles of radiation protection within the diagnostic imaging environment.
04	Understand the importance of the ionising radiation regulations and the responsibilities of radiographers in assuring their implementation and actions to take where incidents occur.

Learning, Teaching and Assessment Strategy

Keynote lectures will introduce key module concepts. Face to face learning activities will include practical simulations and scenario activities supported by a simulation portfolio and will facilitate demonstration of X-ray production and application of radiation safety measures, allowing students to experiment and gain deeper subject understanding. Facilitated peer discussions, scenario activities and lectures will explore the responsibilities of radiographers under the legislation surrounding diagnostic use of ionising radiation and reporting of incidents.

Asynchronous directed learning activities will support the development of independent learning skills through reflection and self-assessment of understanding of the learning materials. The reading list and CANVAS VLE materials will support further exploration of the module syllabus to provide learning extension for students

A computer delivered MCQ examination will assess learning outcomes 1, 2 ,3 and 4.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Online MCQ Examination	Multiple Choice Examination	100%
Formative	Examination - MCQ	VLE delivered quiz (15mins)	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.