

Module Details	
Module Title	Image Acquisition and data display
Module Code	RAD4505-B
Academic Year	2023/4
Credits	20
School	School of Allied Health Professions and Midwifery
FHEQ Level	FHEQ Level 4

Contact Hours	
Type	Hours
Directed Study	3
Independent Study	153.5
Seminars	3
Lectures	13.5
Placement	27 (of which 13.5 are virtual simulated placement activities)

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

Module Aims
This module will develop student knowledge and skills related to digital image acquisition and image processes within medical imaging including factors that influence image appearances and how these might be optimised.

Outline Syllabus

Explore x-ray photon interaction with matter at the atomic level including photoelectric absorption and Compton scattering with the use of attenuation coefficients to quantify attenuation properties of materials.
 Evaluate the impact of manipulating exposure factors and equipment design on radiographic anatomy and image display.
 Explore the development of detector technology and their application in radiographic practice.
 Optimisation and measures of image quality, exposure and deviation index and object to image distance.
 Understand the concept of signal noise and image quality degradation due to Compton scatter and use equipment (grids/Buckys) and techniques to control scatter.
 Quality assurance testing.
 Calculations for dose measurement including surface entrance dose, effective dose and cumulative dose.
 Image display technology, algorithms and histograms and post-processing tools available on PACS.
 Virtual perception linked to physiology of human eye and impact of viewing environment.

Learning Outcomes

Outcome Number	Description
01	Explain photon interaction with matter, factors influencing x-ray beam intensity and quality, and practical optimisation techniques for a range of routine projectional radiographic examinations.
02	Describe a range of quality assurance tests, dose estimations and measurements and including their recording and reporting.
03	Explain the design and function of x-ray detectors in the production of a radiographic image and approaches to mitigate the degradation of image quality.
04	Determine how post-processing algorithms and tools can be used to optimise image appearance.

Learning, Teaching and Assessment Strategy

Keynote lectures will introduce key technological concepts and its influence on dose, image production, image quality and image display. Face to face learning activities will include facilitated peer discussions, scenario activities and lectures. A workbook containing a series of formative and summative practical application exercises and reflections will guide the practical simulation sessions and allow students to use the X-Ray, PACs and virtual radiography equipment to explore the impact of the technology on image production and appearance.

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.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Coursework	Assessed workbook of activities and reflections	100%
Referral	Computerised examination	MCQ style examination	100%
Formative	Coursework	Formative feedback on workbook activities.	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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