



## MODULE SPECIFICATION

Part 1: Information			
Module Title	Fundamentals of Ultrasound Technology		
Module Code	UZZY8P-15-M	Level	Level 7
For implementation from	2020-21		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Health & Applied Sciences	Field	Allied Health Professions
Department	HAS Dept of Allied Health Professions		
Module Type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co-requisites	None		
Module Entry Requirements	None		
PSRB Requirements	None		

Part 2: Description
<p><b>Educational Aims:</b> This module is designed to give a foundation in the science and instrumentation of medical ultrasound, and give you the knowledge and understanding needed to perform examinations safely and competently. It will also address issues relating to new technology and quality assurance.</p> <p><b>Outline Syllabus:</b> Typically, this module will cover:</p> <p>Nature of Ultrasound - Continuous-waves: properties, generation, propagation, interactions, processing, acoustic impedance. Pulsed-waves: Piezoelectric effect, beam shapes and transducers, focusing, power, intensity, bandwidth, pulse-repetition frequency, resolution and artefacts.</p> <p>Instrumentation and System Design - Transducer design and technology ("fitness for role"), pulse-echo principles, A-mode, B-mode, M-mode, real time, measurements. Image storage and recording media, manipulation and display.</p> <p>Contemporary Advancements – basic overview of tissue harmonic imaging, contrast media,</p>

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transducer technology, 3D/4D ultrasound.

Doppler Techniques - Doppler Effect continuous and pulsed-wave; analyses and display of Doppler signals (spectral, colour flow imaging, power); clinical applications.

Quality Control and Performance Checks - Quality assurance, acceptance testing and phantoms.

Bio-effects, Dosimetry and Safety - Thermal, cavitation, radiation stress effects ("non-thermal noncavitational"), "in-vivo" "in-vitro", and epidemiological studies, safety indices, methods to minimise risks, current research.

**Teaching and Learning Methods:** The module will consist of a mixture of lectures and practical workshops. The student will be expected to contribute to discussions based on your own knowledge and experiences, and recognise gaps in their knowledge and understanding and to investigate these areas by asking questions and reading around the subject.

### Part 3: Assessment

Component A: 2 hour examination.

Rationale: The assessment is designed to assess and demonstrate that students can apply an in-depth knowledge of ultrasound physics, equipment and instrumentation to a range of issues, including safety and quality assurance, management of the service and clinical practice. The examination will include a range of question styles to enable assessment of the range of learning outcomes.

Formative Assessment Opportunities: During the module students will have the opportunity to engage in formative exam questions and assessment workshops.

First Sit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	100 %	2 hour examination.
Resit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	100 %	2 hour examination.

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<b>Part 4: Teaching and Learning Methods</b>																	
Learning Outcomes	<p>On successful completion of this module students will achieve the following learning outcomes:</p> <table border="1"> <thead> <tr> <th style="text-align: left;"><b>Module Learning Outcomes</b></th> <th style="text-align: left;"><b>Reference</b></th> </tr> </thead> <tbody> <tr> <td>Explain the systematic application of ultrasound physics, equipment and instrumentation.</td> <td>MO1</td> </tr> <tr> <td>Critically evaluate the equipment and technological processes used to process, display and view images.</td> <td>MO2</td> </tr> <tr> <td>Explain the processes required to produce optimum diagnostic images, and their application.</td> <td>MO3</td> </tr> <tr> <td>Consider and critically evaluate ultrasound technology to enable optimum use of the ultrasound equipment within the current recommendations for safe practice, with particular reference to biohazards.</td> <td>MO4</td> </tr> </tbody> </table>	<b>Module Learning Outcomes</b>	<b>Reference</b>	Explain the systematic application of ultrasound physics, equipment and instrumentation.	MO1	Critically evaluate the equipment and technological processes used to process, display and view images.	MO2	Explain the processes required to produce optimum diagnostic images, and their application.	MO3	Consider and critically evaluate ultrasound technology to enable optimum use of the ultrasound equipment within the current recommendations for safe practice, with particular reference to biohazards.	MO4						
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Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p><a href="https://uwe.rl.talis.com/">https://uwe.rl.talis.com/</a></p>																

<b>Part 5: Contributes Towards</b>
This module contributes towards the following programmes of study: