MODULE SPECIFICATION

Part 1: Information			
Module Title	Fundamentals of Ultrasound Technology		
Module Code	UZYY8P-15-M	**Level**	M
For implementation from	January 2020		
UWE Credit Rating	15	**ECTS Credit Rating**	7.5
Faculty	Health and Life Sciences	**Field**	Allied Health Professionals
Department	HAS		
Contributes towards	MSc Medical Ultrasound		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

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.

Typically, this module will cover:

- 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.
- 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.
- Contemporary Advancements – basic overview of tissue harmonic imaging, contrast media, 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 non-cavitational"), "in-vivo" "in-vitro", and epidemiological studies, safety indices, methods to minimise risks, current research.

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: Strategy and Details

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.

Identify final timetabled piece of assessment (component and element)	Component A	
% weighting between components A and B (Standard modules only)	**A:** **100**	**B**:

First Sit

Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. 2 hour examination	100

Resit (further attendance at taught classes is not required)

Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. 2 hour examination	**100**

Part 4: Learning Outcomes & KIS Data

Learning Outcomes	On successful completion of this module students will be able to: • Explain the systematic application of ultrasound physics, equipment and instrumentation • Critically evaluate the equipment and technological processes used to process, display and view images • Explain the processes required to produce optimum diagnostic images, and their application • 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.

	All learning outcomes are assessed through Component A.
Key Information Sets Information (KIS) **Contact Hours** **Total Assessment**	**Key Information Set - Module data** *Number of credits for this module* 15 Hours to be allocated: 150 | Scheduled learning and teaching study hours: 36 | Independent study hours: 114 | Placement study hours: 0 | Allocated Hours: 150 The table below indicates as a percentage the total assessment of the module which constitutes a; **Written Exam**: Unseen or open book written exam **Coursework**: Written assignment or essay, report, dissertation, portfolio, project or in class test **Practical Exam**: Oral Assessment and/or presentation, practical skills assessment, practical exam (i.e. an exam determining mastery of a technique) Total assessment of the module: Written exam assessment percentage: 100% Coursework assessment percentage: 0% Practical exam assessment percentage: 0% 100%
Reading List	https://rl.talis.com/3/uwe/lists/B54FE027-BDA5-3660-D7FD-4397CF17F1D6.html?lang=en-GB&login=1

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First Approval Date (and panel type)	29 August 2019 Programme Enhancement Review			
Revision ASQC Approval Date *Update this row each time a change goes to ASQC*		**Version**	2	