University of the West of England
BRISTOL

CORPORATE AND ACADEMIC SERVICES

MODULE SPECIFICATION

Part 1: Basic Data						
Module Title	Science and Technology in Radiotherapy					
Module Code	UZYSWU-15-M		Level	M	Version	1
Owning Faculty	Faculty of Health and Applied Sciences		Field	Allied Health Professions		
Contributes towards	MSc Radiotherapy and Oncology					
UWE Credit Rating	15	ECTS Credit Rating	7.5	Module Type	Standard	
Pre-requisites	None		Co- requisites	None		
Excluded Combinations	Fundamentals of anatomy physiology and radiographic Sciences UZYSHM-20-M		Module Entry requirements	None		
Valid From	January 2016		Valid to	January 2021		

CAP Approval Date	6 October 2015

Part 2: Learning and Teaching	
Learning Outcomes	On successful completion of this module students will be able to: 1. Demonstrate an understanding of the importance of radiation interaction processes with matter and their significance to image production and the delivery of radiotherapy treatment. (Component A) 2. Appraise the principles of radiation protection and current UK radiation protection regulations/recommendations in radiotherapy with reference to service users, carers, staff and members of the public. (Component A) 3. Demonstrate an understanding of radiobiological principles and their application to radiotherapy clinical practice (Component A) 4. Describe the construction and function of a range of relevant radiotherapy treatment and imaging equipment (Component A) 5. Discuss a range of imaging modalities (Component A) 6. Discuss the methods employed to produce a treatment plan for a common treatment site (Component A)
Syllabus Outline	**Physics principles** Concept of energy and electromagnetic radiation Ionising and non-ionising radiations in the environment Interaction of ionising radiation with matter Inverse square law; half value-thickness

<table>
<tr><td></td><td>Biological effects of ionising radiation
Radiation protection: principles associated with radiotherapy, including related regulations/guidance
Detection and measurement of ionising radiation
Radioactivity; decay process; half-life

Radiographic equipment relevant to radiotherapy planning, imaging and treatment
2D and 3D diagnostic imaging methods
Linear Accelerator and associated features e.g. beam modification, beam energy, modality and on-board imaging/verification facilities
Radiotherapy planning software
Advantages/limitations of different treatment energies and modalities
Advantages/limitations of different imaging and verification methods</td></tr>
<tr><td>Contact Hours</td><td>This module runs over a 15 week period and scheduled teaching will incorporate practical sessions in small groups, to undertake radiotherapy treatment planning computer systems. Each student will have approximately 4 hours a week of scheduled learning over 11 weeks. In the remaining 4 weeks revision sessions will be undertaken. Independent study will be approximately 7 hours a week and this will include undertaking planning computer work remotely to gain more experience.</td></tr>
<tr><td>Teaching and Learning Methods</td><td>Scheduled learning includes lectures (with the BSc Radiotherapy and Oncology programme where able),seminars, demonstration, practical classes such as radiotherapy treatment planning computers and VERT

Independent learning includes hours engaged with essential reading, revision of material and remote access to the planning computers when possible</td></tr>
<tr><td>Key Information Sets Information</td><td>Key Information Sets (KIS) are produced at programme level for all programmes that this module contributes to, which is a requirement set by HESA/HEFCE. KIS are comparable sets of standardised information about undergraduate courses allowing prospective students to compare and contrast between programmes they are interested in applying for.

<u>Key Information Set - Module data</u>

Number of credits for this module 15

<table>
<tr><th>Hours to be allocated</th><th>Scheduled learning and teaching study hours</th><th>Independent study hours</th><th>Placement study hours</th><th>Allocated Hours</th></tr>
<tr><td>150</td><td>44</td><td>106</td><td>0</td><td>150</td></tr>
</table>

The table below indicates as a percentage the total assessment of the module which constitutes a -

Written Exam: Unseen written exam</td></tr>
</table>

	Total assessment of the module:				
	Written exam assessment percentage				100%
	Coursework assessment percentage				0%
	Practical exam assessment percentage				0%
					100%
Reading Strategy	Essential reading will be clearly indicated in the module handbook which will be made available via Blackboard. A suggested selection of texts will be chosen either in hard copy or as e-books. Reading lists will be reviewed annually by the library in order to ensure currency of information. Reading strategies will be outlined during the module introduction lecture. Further reading is strongly recommended. Students will be directed to a variety of sources including on-line materials via the module handbook. Additional reading materials will also be made available through Blackboard. Formal opportunities for students to develop their library and information skills are provided within the induction period. Additional support is available through the Library Services web pages, including interactive tutorials on finding books and journals, evaluating information and referencing.
Indicative Reading List	The following list is offered to provide validation panels/accrediting bodies with an indication of the type and level of information students may be expected to consult. As such, its currency may wane during the life span of the module specification. However, as indicated above, CURRENT advice on readings will be available via other more frequently updated mechanisms, including annual updates provided by the library. Armstrong, P., Wastie, M.L. & Rockall, A.G. (2009), *Diagnostic imaging*, Chichester, Wiley-Blackwell. Ball, J., Moore, A.D. and Turner, S. (2008) *Ball and Moore's essential physics for Radiographers*. 4th ed. [online] Oxford:.Blackwell Scientific. Bo, W.J. (2007) *Basic atlas of sectional anatomy: with correlated imaging*. 4th ed. London: Elsevier. Bridge, P. and Tipper, D. (2011) *CT anatomy for radiotherapy.* [online] Keswick: M&K update ltd. Butler P. Mitchell A. Healy J. (2012) *Applied Radiological Anatomy 2nd ed.* Cambridge: Cambridge University Press. Easton, S. (2009) *An introduction to Radiography*. [online] Edinburgh: Churchill Livingstone. Fanti S. Farsad M. Mansi L. (2011) *Atlas of SPECT-CT 1st Edition.* New York: Springer Holmes, K. (2013) *Clark's Essential physics in Imaging for Radiographers.* London: Taylor & Francis. Sibtain, A., Morgan, A. and MacDougall, N. (2012) *Radiotherapy in practice: physics for clinical oncology*. [online] Oxford: Oxford University Press,

	Symonds, P. and Walter, J. (2012) *Walter and Miller's textbook of radiotherapy: radiation physics, therapy and oncology*.[online] Edinburgh: Elsevier Churchill Livingstone.

Part 3: Assessment	
Assessment Strategy	Component A – 2 hour unseen written examination. Rationale: To allow assessment of a broad syllabus to ensure that students have the underpinning knowledge necessary for clinical practice for the first clinical placement. This will involve a range of questions which could include short answer and diagram labelling. Formative assessment will be undertaken during this module and it will consist of a portfolio of evidence of practical skills related to radiotherapy computerised/ dosimetry planning. Feedback will be ongoing through tutors and peer support.

Identify final assessment component and element	**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. Unseen written exam (2hrs)	100%
Component B **Description of each element**	**Element weighting** **(as % of component)**
1.	

Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. Unseen written exam (2hrs)	100%
Component B **Description of each element**	**Element weighting** **(as % of component)**
1.	
If a student is permitted an **EXCEPTIONAL RETAKE** of the module the assessment will be that indicated by the Module Description at the time that retake commences.	