PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	Master of Science
4	**Programme Title**	See item 5
5	**Programme Code**	MSc in Clinical Science (Radiotherapy Physics) 5249P MSc in Clinical Science (Radiation Safety and Diagnostic Radiology) 5250P MSc in Clinical Science (Nuclear Medicine) 5251P MSc in Clinical Science (Imaging with Non-Ionising Radiation) 5252P CPD Clinical Science 6044P
6	**Programme Accreditation**	National School of Healthcare Science / Health Education England
7	**QAA Subject Benchmark(s)**	N/A
8	**FHEQ Level**	7
9	**Last updated**	September 2022

10 Programme Aims

To provide a career framework for healthcare science professionals by providing an education and training programme that is clear and coherent. This will enable the individual to enter a defined healthcare science career. The programme has been developed to meet workforce needs and will ensure flexibility, sustainability and modern career pathways for healthcare scientists, fit to address the needs of future NHS.

MSc in Clinical Science (Medical Physics) programme will offer an MSc in four specialisms namely:

i. Radiotherapy Physics
ii. Radiation Safety and Diagnostic Radiology Physics
iii. Nuclear Medicine
iv. Imaging with Non-Ionising Radiation

11 Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas.

Knowledge and Understanding

On completing the programme students should have:

A1 a systematic understanding of Medical Physics and a critical awareness of current problems and/or new insights at the forefront of their specialist area of professional practice;
A2 an in-depth understanding of the knowledge required to support each work-place specialism, specifically 'Radiotherapy Physics, Radiation Safety and Diagnostic Radiology Physics, INuclear Medicine & Imaging with Non-Ionising Radiation'.
A3 a systematic understanding of a substantial body of knowledge which is at the forefront of their specialist area of professional practice;
A4 a detailed understanding of applicable techniques for research and advanced academic enquiry.

Teaching and Learning Methods

A1–A4 are achieved by lectures, seminars and laboratory classes. **A2** will be supported initially by an intensive teaching programme of lectures, seminars and group based discussion at Newcastle. Subsequent to this, students will then undertake a series of work-based modules during their clinical rotations which will be supported later by further intensive teaching days, and through online learning / discussion boards, therefore enabling students to develop state of the art clinical knowledge and practical skills (see also **B1-B5** below). In the cases of **A1** and **A3**, lectures and seminars are also accompanied by practical sessions and visits to the clinical facilities in the local area (North East region). The teaching strategy for **A4** includes lectures to set out baseline knowledge, principles and standards, and small group discussions, group exercises and seminars where current knowledge and R&D outputs are presented and examined from a range of perspectives.

Students will acquire knowledge through team work, case studies, presentations, and independent study and research. Some modules include short problem solving exercises.

Assessment Strategy

Intended learning outcomes regarding knowledge and understanding are assessed based on coursework involving both written and oral communications at the individual or team level. This will include a variety of continuous forms of assessment including essays, problem-solving exercises, laboratory reports and case studies and both formative and summative assessments. The virtual learning environment, Canvas, will be used for both formative and summative assessments. The examinations will be held in the traditional format with students attending the University.

Closed book examinations will be used as a complementary means of assessing factual knowledge.

Intellectual Skills

On completing the programme students should be able to:

B1 synthesise key findings and knowledge from across the Clinical Science spectrum, in particular those relating to Medical Physics, to enhance patient outcomes and welfare;
B2 make informed judgements on complex issues in their specialist field, often in the absence of complete data, and communicate their ideas and conclusions directly clearly and effectively to specialist and non-specialist audiences including patients;
B3 undertake applied research and development at an advanced level, contributing substantially to the development of new techniques, ideas, or approaches in their specialist area;
B4 critically evaluate the quality of data and information offered from different sources;
B5 demonstrate the general ability to conceptualise, design and implement a project for the generation of new knowledge, applications or understanding at the forefront of their specialist discipline and to adjust the project design in the light of unforeseen problems.

Teaching and Learning Methods

Intellectual skills (**B1-B5**) are developed progressively throughout the programme in modules containing seminars, case studies and as part of their work-based learning.

Throughout the programme, students will develop intellectual skills by participating in group discussions, case studies and in their workplace to enhance their **(a)** analytical and interpretative faculties and **(b)** ability to formulate objective and coherent arguments.

Work based Clinical Rotations and associated team problem solving exercises are the main method used to enhance intellectual skills related to applying best practice in research and in making judgements to enhance patient welfare and outcomes.
Design, execution, statistical analysis and reporting of the final dissertation project enhance the learning of these skills in a focused manner.

Assessment Strategy

B1 is assessed through individual and/or group preparation exercises and particularly through the case led problem based learning (C/PBL) write up.
B1 & B2 are assessed via oral presentations and assessed essays.
B1 & B2 are also assessed in certain optional modules by closed book examinations. The interactive learning environment, Canvas, will be used for both formative and summative assessments.
B3 & B4 are assessed using a range of conventional scientific formats including preparation of an abstract, a poster, a presentation and a dissertation. The project with all of these assessments tests a range of transferable skills.
B5 is assessed by the production of a project proposal, literature review and project dissertation.

Practical Skills

On completing the programme students should be able to:

C1 identify a wide range of analytical and clinical science methods across the Medical Physics discipline but specifically in their own elective specialization;
C2 prepare and present information, in both written and verbal formats, to stakeholders (e.g. patients, clinical colleagues, other Healthcare Professionals and the public) with contrasting levels of knowledge and understanding;
C3 assemble a body of data, analyse and critically evaluate the data and its source using appropriate statistical and qualitative techniques;
C4 work across an interdisciplinary team to maximise patient care and outcomes.

Teaching and Learning Methods

Practical Skills (**C1-C4**) are primarily obtained through coursework, clinical rotations, assignments and the research project.

C2 & C3 will be developed through specific components (data handling, statistical and research) which are included in all compulsory modules.

Assessment Strategy

The assessment of practical skills (**C1-C4**) will be based on **(a)** written assessment (including bibliographies) produced as part of essays, seminar presentations and the final project dissertation, **(b)** data handling and analyses carried out as part of problem solving exercises and the project dissertation and **(c)** presentations to their peer cohort, work place and University supervisors and other stakeholder groups.

Transferable/Key Skills

On completing the programme students should be able to:

D1 exercise initiative and personal responsibility;
D2 make decisions in complex and unpredictable situations;
D3 take responsibility for their own learning as is required for continuing professional development;
D4 work effectively as a member of teams both subject specific and multi-disciplinary;
D5 use effective time and resource management practices.

Teaching and Learning Methods

Transferable/Key skills **D1-D5** are developed throughout the programme through course-work, student led sessions, clinical visits, clinical rotations, final dissertation and workshops.

Assessment Strategy
Key skills **D1-D5** are indirectly assessed through formative coursework, team and individual presentations, research papers and the dissertation, including a supervisor's mark for the conduct of the project. Additional formative assessment comes through the workplace supervisor who is asked to comment on the student's progress during the clinical rotations related to modules MPY8001 and MPY 8005-12, as relevant to their specific study pathways, against key skills **D1-D5**.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

This programme is available as part time study comprising modules to a value of 180 credits, studied over 3 years.

A master's candidate shall study taught modules to a value of 120 credits and project modules to a value of 60 credits. All modules are core.

A group of **"common" core ("Generic") modules** will be delivered across all specialisms thus providing a common "backbone" to the curriculum.

Broad Framework of national MSc in Clinical Science (Medical Physics) training:

Year 1	Year 2	Year 3
Foundations in Professional Practice & Clinical Leadership in Healthcare Science	Foundations in Professional Practice & Clinical Leadership in Healthcare Science [20] Research Methods [10]	
Introduction to Specialist Medical Physics: underpinning knowledge for rotational work based training [40]		
	Radiotherapy Physics	
Route map of MSc Clinical Science (Medical Physics) with specialisms in Radiotherapy Physics, Radiation Safety and Diagnostic Radiology Physics, Nuclear Medicine and Imaging with Non-Ionising Radiation. In Year 1, trainees begin by following the generic curriculum, which Spans all divisions (blue) together with some division/theme-specific modules (yellow). In Year 2 and 3, trainees specialise (orange).	Radiotherapy Physics 1 [20] Research project [30]	Radiotherapy Physics 2 [30] Research Project [30]
	OR	
	Radiation Safety and Diagnostic Radiology Physics	
	Radiation Safety and Diagnostic Radiology [20] Research Project [30]	Radiation Safety and Diagnostic Radiology 2 [30] Research Project [30]
	OR	
	Nuclear Medicine	
	Nuclear Medicine 1 [20] Research Project [30]	Nuclear Medicine 2 [30] Research Project [30]
	OR	
	Imaging with Non-ionising Radiation	
	Imaging with Non-ionising Radiation 1 [20] Research Project [30]	Imaging with Non-ionising Radiation 2 [30] Research Project [30]

Credits			
Generic	20	10	0
Division/Theme	40	0	0
Specialism		50	60
Total	60	60	60

<table>
<tr><td rowspan="6"></td><td colspan="2">Year 3 Specialist Practice</td><td>Healthcare Science
Specialist Learning with Integrated Professional Practice

[30]</td><td>Research Project
Students would usually begin a work based research project in Year 2 and complete the project in Year 3

[30]</td></tr>
<tr><td colspan="4">Specialism</td></tr>
<tr><td colspan="2">Year 2 Specialist Practice</td><td>Healthcare Science
Specialist Learning
With Integrated Professional Practice

[20]</td><td>Research Project
Students would usually begin a work based research project in Year 2 and complete the project in Year 3

[30]</td></tr>
<tr><td colspan="4">Specialism</td></tr>
<tr><td rowspan="2">Year 1 Core Modules</td><td>Research Methods

[10]</td><td>Healthcare Science
with Integrating science and Professional Practice [20]</td><td colspan="2">Healthcare Science
Integrating underpinning knowledge required for each rotational element with Professional Practice
[40]</td></tr>
<tr><td colspan="2">Generic</td><td colspan="2">Division/Theme</td></tr>
</table>

Key features of the programme (including what makes the programme distinctive)

The programme is designed to provide an all-round education in a number of selected areas of Medical Physics in a Healthcare Science setting. The programme is commissioned by Health Education England and accredited by the National School of Healthcare Science to deliver the academic component of the Scientist Training Programme in Medical Physics. Teaching will involve a mixture of face-to-face learning and e-learning via Newcastle University's VLE Canvas. Through this medium, students will be able to interact with other students from across the different themes covered in this programme. This will be continued throughout the programme stages. Discussion boards may also include students from a number of different disciplines including students taking the module as standalone CPD (e.g. Medical Registrars, Clinical Trial Managers, Research Nurses), creating an ethos of an inter-professional learning.

The programme has been designed so that in each year the students' specialism specific taught material is front loaded into the intensive teaching weeks (seven weeks in year 1, two weeks in years 2 and 3). This will enable the student to absorb the knowledge required to prepare them for their clinical rotations and then latterly for their specialism specific role and enable them to work effectively through their work-based clinical rotations. This method of "knowledge loading" also supports the problem based learning approach and prepares them for their clinical rotations.

The students will have the benefit of accessing the expertise, learning and clinical facilities of Newcastle University as well as of clinical facilities at Newcastle upon Tyne Hospitals NHS Foundation Trust and other facilities in the North East region, and from experts in their field throughout the North East region.

The link between the theoretical underpinning provided by the academic input and the direct application of theory to practice in the workplace makes these programmes distinctive.

Programme regulations (link to on-line version)

-R5249P_6044P_vFinal.pdf

13 Support for Student Learning

https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf

14 Methods for evaluating and improving the quality and standards of teaching and learning

https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf

15 Regulation of assessment

https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf

In addition, information relating to the programme is provided in:

The University Prospectus: http://www.ncl.ac.uk/postgraduate/courses/

Degree Programme and University Regulations: http://www.ncl.ac.uk/regulations/docs/

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided.