

**PROGRAMME
SPECIFICATION**



1	Awarding Institution	Newcastle University
2	Teaching Institutions	Newcastle University
3	Final Award	MSc in Clinical Science (Physiological Sciences: Cardiac Science); MSc in Clinical Science (Physiological Sciences: Vascular Science); MSc in Clinical Science (Physiological Sciences: Respiratory & Sleep Science); MSc in Clinical Science (Physiological Sciences: Gastrointestinal Physiology); MSc in Clinical Science (Physiological Sciences: Urodynamic Science)
4	Programme Title	Modernising Scientific Careers: MSc in Clinical Science (Physiological Sciences)
5	UCAS/Programme Code	5188P MSc in Clinical Science (Physiological Sciences: Cardiac Science) 5189P MSc in Clinical Science (Physiological Sciences: Vascular Science) 5190P MSc in Clinical Science (Physiological Sciences: Respiratory and Sleep Science) 5191P MSc in Clinical Science (Physiological Sciences: Gastrointestinal Physiology) 5192P MSc in Clinical Science (Physiological Sciences: Urodynamic Science)
6	Programme Accreditation	Department of Health / Medical Education England Healthcare Science Programme Board
7	QAA Subject Benchmark(s)	
8	FHEQ Level	7
9	Date written/revised	24th January 2012

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.

Modernising Scientific Careers: MSc in Clinical Science (Physiological Sciences) programme will offer an MSc in five specialisms namely:

- i. Cardiac Science
- ii. Vascular Science
- iii. Respiratory and Sleep Science
- iv. Gastrointestinal Physiology
- v. Urodynamic Science

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
<p>On completing the programme students should have:</p> <p>A1 a systematic understanding of Physiological Sciences and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of their specialist area of professional practice;</p> <p>A2 an in-depth understanding of the knowledge required to support each work-placed specialism, specifically 'Cardiac Science, Respiratory & Sleep Science, Vascular Science, Clinical Assessment and Investigation, Gastrointestinal Physiology and Urodynamic Science'.</p> <p>A3 a systematic understanding of a substantial body of knowledge which is at the forefront of their specialist area of professional practice;</p> <p>A4 a detailed understanding of applicable techniques for research and advanced academic enquiry.</p>
Teaching and Learning Methods
<p>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.</p> <p>Students will acquire knowledge through team work, case studies, presentations, and independent study and research. Some modules include short problem solving exercises.</p>

Assessment Strategy
<p>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 provide both formative and summative assessment through relevant examples. The virtual learning environment, Blackboard, will be used for both formative and summative assessments. The examinations will be held in the traditional format with students attending the University.</p> <p>Closed book examinations will be used as a complementary means of assessing factual knowledge.</p>
Intellectual Skills
<p>On completing the programme students should be able to:</p> <p>B1 synthesise key findings and knowledge from across the Clinical Science spectrum, in particular those relating to Physiological Sciences, to enhance patient outcomes and welfare.</p> <p>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 audience including patients.</p> <p>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.</p> <p>B4 critically evaluate the quality of data and information offered from different sources.</p> <p>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;</p>

<p>Teaching and Learning Methods</p> <p>Intellectual skills (B1-B5) are developed progressively throughout the programme in modules containing seminars, case studies and as part of their work-based learning.</p> <p>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.</p> <p>Work based Clinical Rotations and associated problem based learning 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.</p> <p>Design, execution, statistical analysis and reporting of the final dissertation project enhance the learning of these skills in a focused manner.</p>
<p>Assessment Strategy</p> <p>B1 is assessed through individual and/or group preparation exercises and particularly through the case-led/problem based learning (C/PBL) write up.</p> <p>B1 & B2 are assessed via oral presentations and assessed essays.</p> <p>B1 & B2 are also assessed in certain optional modules by closed book examinations</p> <p>The interactive learning environment, Blackboard, will be used for both formative and summative assessments.</p> <p>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.</p> <p>B5 is by the production of a project proposal, literature review and project dissertation.</p>
<p>Practical Skills</p> <p>On completing the programme students should be able to:</p> <p>C1 identify a wide range of analytical and clinical science methods across the Physiological Sciences discipline but specifically in their own elective specialisation</p> <p>C2 prepare and present information, in both written and verbal formats, to stakeholders (e.g. patients, clinical colleagues, other Health Professionals and the public) with contrasting levels of knowledge and understanding</p> <p>C3 assemble a body of data, analyse and critically evaluate the data and its source using appropriate statistical and qualitative techniques.</p> <p>C4 work across an interdisciplinary team to maximise patient care and outcomes.</p>
<p>Teaching and Learning Methods</p> <p>Practical Skills (C1-C4) are primarily obtained through coursework, clinical rotations, assignments and the research project.</p> <p>C2 & C3 will be developed through specific components (data handling, statistical and research) which are included in all compulsory modules.</p>
<p>Assessment Strategy</p> <p>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 thesis, (b) data handling and analyses carried out as part of problem solving exercises and the project thesis and (c) presentations to their peer cohort, work place and University supervisors and other stakeholder groups.</p>

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** have the learning ability 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 coursework, 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 CVR 8001-9 and 8011-21, as relevant to their specific study pathways, against key skills **D1-D5**.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

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 *Modernising Scientific Careers* MSc in Clinical Science (Physiological Sciences) training:

Year 3 Specialist Practice	Healthcare Science Specialist Learning with Integrated Professional Practice [30]		Research Project Trainees would usually begin a work-based research project in Year 2 and complete the project in Year 3 [30]
Specialism			
Year 2 Specialist Practice	Research Methods [10]	Healthcare Science Specialist Learning with Integrated Professional Practice [20]	Research Project Trainees would usually begin a work-based research project in Year 2 and complete the project in Year 3 [30]
	Generic	Specialism	
Year 1 Core Modules	Healthcare Science with Integrated Professional Practice [20]		Healthcare Science Integrating underpinning knowledge required for each rotational element with Professional Practice [40]
	Generic		Divisional/Theme

- General Modules: Common to all divisions of Healthcare Science
- Division/Theme Specific Modules: Common to a division or theme
- Specialist Modules: Specific to a specialism

Route Map for progression pathways through the MSc in Clinical Science (Physiological Sciences)

Year 1		Year 2		Year 3	
Integrating Science & Professional Practice (20)		Research Skills for Health Care Professionals (10)			
EITHER					
Introduction to Cardiac, Vascular, Respiratory & Sleep Science, and Clinical Assessment and Investigation (40)					
OR					
Introduction to Gastrointestinal Physiology, Urodynamic Science, and Clinical Assessment and Investigation (30)					
AND					
Introduction to Cardiac Science, OR Introduction to Respiratory & Sleep Science (10)		EITHER			
		Cardiac Science			
		Diagnostic Approaches & Current Treatment of Cardiovascular Disorders (20)		Ultrasound Imaging in Cardiac Disease (30)	
				OR	
				Diagnosis & Management of Cardiac Rhythm Disorders (30)	
		Research Project 1 (30)		Research Project 2 (30)	
		OR			
		Respiratory & Sleep Science			
		Respiratory & Sleep Science 1 (20)		Respiratory & Sleep Science 2 (30)	
		Research Project 1 (30)		Research Project 2 (30)	
		OR			
		Vascular Science			
		Ultrasound Science & Instrumentation (10)		Extracranial Vascular Ultrasound (10)	
				Peripheral Arterial Imaging, Vascular Screening & Microvascular Investigation (10)	
		Haemodynamics & Ultrasound Safety (10)		Peripheral Venous Imaging (10)	
		Research Project 1 (30)		Research Project 2 (30)	
		OR			
		Gastrointestinal Physiology			
		Lower GI Physiology & Endoanal Ultrasound (10)		Upper GI Physiology (30)	
		Urodynamic Science 1 (10)			
		Research Project 1 (30)		Research Project 2 (30)	
		OR			
		Urodynamic Science			
		Lower GI Physiology & Endoanal Ultrasound (10)		Urodynamic Science 2 (30)	
		Urodynamic Science 1 (10)			
		Research Project 1 (30)		Research Project 2 (30)	
Generic	20	10		0	
Division/Theme	40	0		0	
Specialism	0	50		60	
Total	60	60		60	

The programme delivery will follow the model outlined in respective Module Outline Forms (MOFS).

The programme consists of:

“Common” core modules (taught across all specialist pathways):

Year one

Pathway 1: Cardiac Science, Vascular Science and Respiratory & Sleep Sciences

CVR 8001 – 8004: Fundamentals of Cardiac, Vascular and Respiratory Sciences

•CVR 8001 Introduction to Cardiac Science (10 Credits)

This module will provide the trainee with knowledge and understanding needed to underpin their Cardiac Science workplace rotation.

•CVR 8002 Introduction to Respiratory and Sleep Science (10 Credits)

This module will provide the trainee with knowledge and understanding needed to underpin their Respiratory and Sleep workplace rotation.

•CVR 8003 Introduction to Vascular Science (10 Credits)

This module will provide the trainee with knowledge and understanding need to underpin their Vascular Science workplace rotation.

•CVR 8004 Clinical Assessment and Investigation (10 Credits)

This module will provide the trainee with knowledge and understanding needed to underpin their Clinical Assessment and Investigation workplace rotation.

In these modules students will receive the specialist knowledge and fundamental training in laboratory methodology and clinical practices necessary for them to perform competently across the four associated clinical rotations that they undertake in their workplace over the course of year one.

Teaching will be delivered during the students' initial intensive four week face to face study period as well as during the subsequent short face to face teaching periods throughout the year. Further learning and supporting materials will be delivered through Newcastle University's VLE Blackboard.

MSC 8001 – Integrating Science and Professional Practice (20 Credits)

The overall aim of this introductory module is to provide students with knowledge and understanding of the basic science and scientific knowledge that will underpin study in any and all of the three divisions of healthcare science namely Physical Sciences & Biomedical Engineering, Life Sciences and Physiological Sciences within the Scientist Training Programme. This module will also introduce the framework for underpinning professional practice across the divisions providing the building blocks for future development of professional practice in the work-place.

The module will be delivered through a blended learning approach i.e. face to face teaching in the initial intensive four week teaching period and further teaching days throughout the year and through Newcastle University's virtual learning environment (VLE) Blackboard.

Pathway 2: Gastrointestinal Physiology & Urodynamic Science

CVR 8005, 8006, 8004 & (8001 or 8002) Fundamentals of Gastrointestinal and Urodynamic Sciences

- **CVR 8005 Introduction to Gastrointestinal Physiology (10 Credits)**

This module will provide the trainee with knowledge and understanding needed to underpin their Gastrointestinal Physiology workplace rotation.

- **CVR 8006 Introduction to Urodynamic Science (10 Credits)**

This module will provide the trainee with knowledge and understanding needed to underpin their Urodynamic Science workplace rotation.

One from two of 'Introduction to Cardiac Science (CVR 8001)', or 'Introduction to Respiratory and Sleep Science (CVR 8002)' (10 Credits each). This module will provide the trainee with knowledge and understanding needed to underpin their appropriate workplace clinical rotation.

- **CVR8004 Clinical Assessment and Investigation (10 Credits)**

This module will provide the trainee with knowledge and understanding needed to underpin their clinical assessment and investigation rotation workplace rotation.

In these modules students will receive the specialist knowledge and fundamental training in laboratory methodology and clinical practices necessary for them to perform competently across the four associated clinical rotations that they undertake in their workplace over the course of year one.

Teaching will be delivered during the students' initial intensive four week face to face study period as well as during the subsequent short face to face teaching periods throughout the year, further learning and supporting materials will be delivered through the University's VLE Blackboard.

Though assessments will be particular to each specialism, the actual delivery will be through an integrated non-modular structure (including cross discipline areas such as ICT, Clinical Measurement, safety, innovation and service improvement).

MSC 8001 – Integrating Science and Professional Practice (20 Credits)

The overall aim of this introductory module is to provide students with knowledge and understanding of the basic science and scientific knowledge that will underpin study in any and all of the three divisions of healthcare science namely Physical Sciences & Biomedical Engineering, Life Sciences and Physiological Sciences within the Scientist Training Programme. This module will also introduce the framework for underpinning professional practice across the divisions providing the building blocks for future development of professional practice in the work-place.

The module will be delivered through a blended learning approach i.e. face to face teaching in the initial intensive four week teaching period and further teaching days throughout the year and through Newcastle University's virtual learning environment (VLE) Blackboard.

Year two

MCR 8201 Research Skills for Health Care Professionals (10 credits)

This module will be delivered in year two as an e-learning module through Newcastle University's VLE (Blackboard).

The overall aim of this module is to ensure that the student has a foundation in research, development and innovation across the NHS and in healthcare science in particular and to provide the knowledge base to complete a successful research project.

MSC 8003 Research Project 1 Identifying and Planning a Project (30 Credits)

This module is taken in year two following the '**Research Skills for Health Care Professionals** (MCR8201) module above. Materials to support the module are delivered through a face to face teaching day and then through the VLE Blackboard. Supervision for the module is from both the students' workplace (professional / clinical mentor) and from the academic partner(s) in the form of an academic tutor.

The aim of this module is to allow students to develop the necessary skills to undertake all the appropriate work needed for them to be able to start a research project and write it up in the third year module '**Research Project 2**'. This module includes elements such as project design, securing ethical and all other related permissions, completing a full project proposal, recruiting patients and ensuring appropriate resources are in place.

Year three

MSC 8004 Research Project 2 (30 Credits)

This module is taken in year three following the students' successful completion of the '**Research Project 1**' module. Materials to support the module are again delivered through the VLE Blackboard and supervision for the module is from both the students' workplace (professional / clinical mentor) and from the academic partner(s) in the form of an academic tutor.

At the end of this project module, the students will have completed a work based research project which has been independently considered and researched which is relevant to their workplace and will add meaningfully to the stock of knowledge and / or improve the policies and procedures of their clinical discipline.

Specialism Specific Modules:

These modules are specific to the student's specialism Pathway.

Cardiac Science Strand

Year 2

CVR 8007 Diagnostic Approaches and Current Treatment of Cardiovascular Disorders (20 Credits)

This module provides trainees with the knowledge that underpins the specialist modules in Cardiology and gives trainees the tools to undertake project based learning in the workplace. This module has three sections which include: non-invasive diagnostics, invasive diagnostics and therapeutic interventions.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 2 and then subsequently across the periodic short teaching block. Additional support will be available through Newcastle University's VLE Blackboard.

Year 3

CVR 8008 Ultrasound Imaging in Cardiac Disease (30 Credits)

This module provides trainees with the knowledge that underpins the third year specialist clinical rotation in Ultrasound Imaging in Cardiac Disease. It will provide trainees with the knowledge, understanding and practical skills related to cardiac ultrasound imaging of patients and provides the knowledge that will underpin learning in the workplace.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 3. Additional support will be available through Newcastle University's VLE Blackboard.

OR

CVR 8009 Diagnosis and Management of Cardiac Rhythm Disorders (30 Credits)

This module provides trainees with the knowledge that underpins the third year specialist clinical rotation in Cardiac Rhythm Management. It will provide trainees with the knowledge, understanding and practical skills to safely contribute to the diagnosis and treatment of patients with abnormalities of cardiac rhythm and provides the knowledge that will underpin learning in the workplace.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 3. Additional support will be available through Newcastle University's VLE Blackboard.

Respiratory and Sleep Science Strand

Year 2

CVR 8011 Respiratory and Sleep Science 1 (20 Credits)

This module provides trainees with the knowledge that underpins the specialist module in Respiratory and Sleep Science and gives trainees the tools to undertake project based learning in the workplace.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 2 and then subsequently across the periodic short teaching block. Additional support will be available through Newcastle University's VLE Blackboard.

Year 3

CVR 8012 Respiratory and Sleep Science 2 (30 Credits)

This module provides trainees with the knowledge that underpins the third year specialist clinical rotation in Respiratory and Sleep Science and gives trainees the tools to undertake learning in the workplace and builds on the material delivered in the year two module.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 3. Additional support will be available through Newcastle University's VLE Blackboard.

Vascular Science Strand

Year 2

CVR 8013 Ultrasound Science and Instrumentation (10 Credits)

This module will provide trainees with the underpinning scientific knowledge and practical skills to safely and competently use ultrasound instrumentation.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 2 and then subsequently across the periodic short teaching block. Additional support will be available through Newcastle University's VLE Blackboard.

CVR 8021 Haemodynamics and Ultrasound Safety (10 Credits)

This module will provide trainees with the underpinning scientific knowledge and practical skills to assess and interpret the haemodynamics of the peripheral vascular system and operate ultrasound equipment in a safe manner..

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 2 and then subsequently across the periodic short teaching block. Additional support will be available through Newcastle University's VLE Blackboard.

Year 3

CVR 8014 Extracranial Vascular Ultrasound (10 Credits)

This module will provide trainees with the underpinning scientific and clinical knowledge and practical skills to assess and interpret extracranial vascular ultrasound investigations

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 3. Additional support will be available through Newcastle University's VLE Blackboard.

CVR 8015 Peripheral Arterial Imaging, Vascular Screening & Microvascular Investigation (10 Credits)

This third year specialist module provides trainees with the underpinning scientific and clinical knowledge and practical skills to safely contribute to the diagnosis and screening of peripheral arterial disease (macro and microvascular), Abdominal Aortic Aneurysms and intracranial lesions (for sickle cell).

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 3. Additional support will be available through Newcastle University's VLE Blackboard.

CVR 8016 Peripheral Venous Imaging (10 Credits)

This third year specialist module provides trainees with the underpinning scientific and clinical knowledge, and practical skills to assess and interpret peripheral venous ultrasound investigations within their clinical context.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching day(s). Additional support will be available through Newcastle University's VLE Blackboard.

Gastrointestinal Physiology

Year 2

CVR 8017 Lower Gastrointestinal Physiology & Endoanal Ultrasound (10 Credits)

This module will provide trainees with the knowledge that underpins the specialist rotation of lower gastrointestinal physiology.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 2. Additional support will be available through Newcastle University's VLE Blackboard.

This module is shared between Gastrointestinal & Urodynamic Science Programmes.

CVR 8018 Urodynamic Science 1 (10 Credits)

This module provides trainees with the knowledge that underpins the specialist clinical rotation in urodynamic science and gives these trainees the tools to undertake project based learning in the workplace.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 2 and in during the intensive teaching days. Additional support will be available through Newcastle University's VLE Blackboard.

This module is shared between Gastrointestinal & Urodynamic Science Programmes.

Year 3

CVR 8019 Upper Gastrointestinal Physiology (30 Credits)

This module provides trainees with the knowledge that underpins the specialist clinical rotation in upper gastrointestinal physiology.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 3 and again in the intensive teaching days throughout the year. Additional support will be available through Newcastle University's VLE Blackboard.

Urodynamic Science

Year 2

CVR 8017 Lower Gastrointestinal Physiology & Endoanal Ultrasound (10 Credits)

This module provides trainees with the knowledge that underpins the specialist clinical rotation in lower gastrointestinal physiology.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 2. Additional support will be available through Newcastle University's VLE Blackboard.

This module is shared between Gastrointestinal & Urodynamic Science Programmes.

CVR 8018 Urodynamic Science 1 (10 Credits)

This module provides trainees with the knowledge that underpins the specialist clinical rotation in Urodynamic Science and gives these trainees the tools to undertake project based learning in the workplace.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 3 and again in the intensive teaching days throughout the year. Additional support will be available through Newcastle University's VLE Blackboard.

This module is shared between Gastrointestinal & Urodynamic Science Programmes.

Year 3

CVR 8020 Urodynamic Science 2 (30 Credits)

This module provides trainees with the knowledge that underpins the third year specialist clinical rotation in Urodynamic Science and provides trainees with the underpinning knowledge to undertake learning in the workplace.

The module will be delivered through blended learning. Initial material will be delivered in the intensive teaching week at the beginning of year 3 and in the intensive teaching days. Additional support will be available through Newcastle University's VLE Blackboard.

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

The national healthcare scientist training programme is part of the wider changes that are taking place within healthcare science education and is designed to train the healthcare scientists of the future (*Modernising Scientific Careers*). Students will join this three-year part-time MSc in Clinical Science (Physiological Sciences) course as part of their full-time integrated training programme of work-based and academic learning. Trainees will be employed by an NHS Trust where they will be required to undertake a range of clinical rotations, working in different departments (and possibly different Trusts), before specialising in the last two years of training. After this period of training, successful trainees will be in a position to apply for NHS posts as healthcare scientists and to the appropriate professional register if applicable.

The academic programme is designed to provide an all round education in a number of selected areas of Physiological Sciences in a Healthcare Science setting. Teaching will involve a mixture of face-to-face learning and e-learning via Newcastle University's VLE Blackboard. 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; in year 2 the 'Research Methods' module (10 credits) 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). 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)

<http://www.ncl.ac.uk/regulations/programme/>

13 Criteria for admission

Entry qualifications

A candidate may be entered at the discretion of the Degree Programme Director and provided that such a candidate:

(a) has a minimum lower-second-class Honours degree, in an appropriate subject, *or* equivalent professional qualification in a profession allied to medicine with at least two years post-qualification experience; and

(b) has secured a training place under the national *Modernising Scientific Careers* to ensure parallel clinical rotations to support the course outcomes.

Admissions policy/selection tools

Applicants will be nominated through the national *Modernising Scientific Careers* selection process.

Non-standard Entry Requirements: None

Additional Requirements: None

Level of English Language capability: overall IELTS score of 7.0, minimum 6.5 in each component.

14 Support for Student Learning

The Student Services portal provides links to key services and other information and is available at: www.ncl.ac.uk/students/

Induction

At the start of the of the first semester students attend an induction programme providing a general introduction to University and the principle support services and general information about the MSc in Clinical Science (Physiological Sciences) course, as described in the Degree Programme Handbook. They will be given detailed programme information and the timetable of lectures/practicals/ labs/tutorials/etc.

Study skills support

Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management, is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Numeracy support and help with academic writing are available at Newcastle University.

Academic support

The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director may be consulted. Each student additionally has a workplace mentor/supervisor in their place of employment who may also be consulted and may also raise issues with the University contacts. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Curriculum Committee and Board of Studies.

Pastoral support

All students are assigned a workplace supervisor (sometimes referred to as employer or mentor) and a University appointed personal tutor. The University personal tutor has responsibility to monitor the academic performance and overall well-being of their tutees. In addition the Medical Sciences Graduate School at Newcastle University has a Postgraduate Senior Tutor for all PG taught programmes who these students may approach should they require further support or where support is not forthcoming. The Degree Programme Director and Module Leaders will also monitor student progress and deal with academic issues as and when they arise. The project modules will involve specific support from the Module Leader. Further pastoral support is available via Newcastle University Student Wellbeing Service who offer a range of support services, including one-to-one counselling and guidance or group sessions/ workshops on a range of topics, such as emotional issues e.g. stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues, and support for all students on a range of topics including housing, debt, legal issues etc. www.unionsociety.co.uk/sac

Support for students with disabilities

Newcastle University's Disability Support Service provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements.

Learning resources

The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities. On-line access to an extensive range of electronic data bases, journals and books will be provided by Newcastle University for all students on the course. The course will utilise Newcastle University's Blackboard VLE with dedicated areas for the course. This will be the vehicle through which supported learning at a distance will be provided, including moderated (supported) discussion boards.

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

Module reviews

All modules are subject to review by questionnaires which are considered by the Curriculum Committee (CC) and Board of Studies. Changes to, or the introduction of new, modules are considered by CC and the Board of Studies and forwarded to the Faculty Teaching, Learning and Student Experience Committee (FTLSEC) for approval. All modules, and the degree programme, are subject to review by student questionnaires. Student opinion is additionally sought at the Staff-Student Committee and the Curriculum Committees and Board of Studies. Major changes to existing modules and the programme of study are also subject to approval by the Faculty Teaching, Learning and Student Experience Committee (FTLSEC).

Programme reviews

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to FTLSEC.

External Examiner reports

External Examiner reports are considered by the Board of Studies. The Board responds to these reports through FTLSEC. External Examiner reports are shared with student representatives, through the Staff-Student Committee.

Faculty and University Review Mechanisms

The programme is subject to the University's Internal Subject Review process. Every five years degree programmes in each subject area are subject to periodic review. This involves both the detailed consideration of a range of documentation, and a visit by a review team which includes an external subject specialist in addition to University and Faculty representatives. Following the review a report is produced, which forms the basis for a decision by University Teaching Learning and Student Experience Committee (UTLSEC) on whether the programmes reviewed should be re-approved for a further five year period.

Additional mechanisms

Employer input will be established formally through a Programme/Employer Liaison Committee, allowing formal input by the employers (the host Trusts where the students are employed and through which their clinical rotations are organised). Additionally, employers will be encouraged to provide informal feedback, e.g. on the course to module leaders, or on issues relating to inter-relations between the academic course and the clinical rotations. Patient input will be sought on all aspects of the programme, including through patient representatives on all programme committees.

16 Regulation of assessment

Pass mark

The pass mark is 50

Course requirements

Progression is subject to the University's Masters Degree Progress Regulations, Taught and Research, and Examination Conventions for Taught Masters Degrees. All modules are core modules. Compensation between modules is NOT allowed. There are reassessment opportunities, in accordance with University regulations.

Common Marking Scheme

The University employs a common marking scheme, which is specified in the Taught Postgraduate Examination Conventions, namely:

Summary description applicable to postgraduate Masters programmes

<50	Fail
50-59	Pass
60-69	Pass with Merit
70 or above	Pass with Distinction

Summary description applicable to postgraduate Certificate and Diploma programmes

<50	Fail
50 or above	Pass

Role of the External Examiner

An External Examiner, a distinguished member of the subject community, is appointed by FTLSEC, after recommendation from the Board of Studies. The External Examiner is expected to:

- See and approve examination papers
- Moderate examination and coursework marking
- Attend the Board of Examiners
- Report to the University on the standards of the programme

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

The University Prospectus (see <http://www.ncl.ac.uk/postgraduate/>)

The School Brochure (contact enquiries@ncl.ac.uk)

The University Regulations (see <http://www.ncl.ac.uk/calendar/university.regs/>)

The specification in this document 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. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

Please note, a version of the Learning Outcomes, indicative Content and Trainee Workplace Learning Guides are available on the Modernising Scientific Careers website: <http://www.networks.nhs.uk/nhs-networks/msc-framework-curricula/stp>.

Mapping of Intended Learning Outcomes onto Curriculum/Modules

		Intended Learning Outcomes			
Module	Type	A	B	C	D
Compulsory modules common to all pathways					
MSC8001: Integrating Science and Professional practice (20 Credits)	Compulsory	1,3	1,4	2,4	1,2,3,4,5
CVR8001: Introduction To Cardiac Science (10 Credits)	Compulsory: CVRS Theme Optional: GI & Urodynamics Theme	1,2,3	1,4	2,4	1,2,4,5
CVR8002: Introduction to Respiratory & Sleep (10 Credits)	Compulsory: CVRS Theme Optional: GI & Urodynamics Theme	1,2,3	1,4	2,4	1,2,4,5
CVR8003: Introduction to Vascular Science (10 Credits)	Compulsory: CVRS Theme	1,2,3	1,4	2,4	1,2,4,5
CVR8004: Clinical Assessment & investigation (10 Credits)	Compulsory	1,2,3	1,4	2,4	1,2,4,5
CVR8005: Introduction to Gastrointestinal Physiology (10 Credits)	Compulsory: GI & Urodynamics Theme	1,2,3	1,4	2,4	1,2,4,5
CVR8006: Introduction To Urodynamic Science (10 Credits)	Compulsory: GI & Urodynamics Theme	1,2,3	1,4	2,4	1,2,4,5
MCR8201: Research Skills for Health Care Professionals (10 Credits)	Compulsory	3,4	5	2,4	1,3,4,5
MSC8003: Research Project 1 (30 Credits)	Compulsory	1,3,4	3,4,5	2,3,4	1,3,4,5
MSC8004: Research Project 2 (30 Credits)	Compulsory	1,3,4	3,4,5	2,3,4	1,3,4,5
Specialism specific modules: Cardiac Science					
CVR8007 Diagnostic Approaches and Current Treatment of Cardiovascular Disorders (20 credits)	Compulsory	1,2,3,4,	1,2,4	1,2,4	1,2,3,4,5
CVR8008 Ultrasound Imaging in Cardiac Disease (30 credits)	Optional	1,3,4	1,2,3,4,5	1,2,3,4	1,2,3,4,5
CVR8009 Diagnosis and Management of Cardiac Rhythm Disorders (30 Credits)	Optional	1,3,4	1,2,3,4,5	1,2,3,4	1,2,3,4,5
Specialism specific modules: Respiratory & Sleep Science					
CVR8011 Respiratory & sleep Sciences 1 (Fundamentals)(20 credits)	Compulsory	1,2,3,4,	1,2,4	1,2,4	1,2,3,4,5
CVR8012 Respiratory and Sleep Sciences 2 (advanced) (10 credits)	Compulsory	1,3,4	1,2,3,4,5	1,2,3,4	1,2,3,4,5
Specialism specific modules: Vascular Science					
CVR8013 Ultrasound Science and Instrumentation (10 credits)	Compulsory	1,2,3,4,	1,2,4	1,2,4	1,2,3,4,5
CVR8021 Haemodynamics & Ultrasound Safety (10 Credits)	Compulsory	1,2,3,4,	1,2,4	1,2,4	1,2,3,4,5
CVR8014 Extracranial Vascular Ultrasound (10 credits)	Compulsory	1,3,4	1,2,3,4,5	1,2,3,4	1,2,3,4,5

CVR8015 Peripheral Arterial (10 credits)	Compulsory	1,3,4	1,2,3,4,5	1,2,3,4	1,2,3,4,5
CVR8016 Peripheral Venous Imaging(10 Credits)	Compulsory	1,3,4	1,2,3,4,5	1,2,3,4	1,2,3,4,5
Specialism specific modules: Gastrointestinal Physiology					
CVR8017 Lower Gastrointestinal Physiology& Endoanal Ultrasound (10 credits)	Compulsory	1,2,3,4,	1,2,4	1,2,4	1,2,3,4,5
CVR8018 Urodynamic Science (10 credits)	Compulsory	1,2,3,4	1,2,4	1,2,4	1,2,3,4,5
CVR8019 Upper GI Physiology (30 Credits)	Compulsory	1,3,4	1,2,3,4,5	1,2,3,4	1,2,3,4,5
Specialism specific modules: Urodynamic Science					
CVR8017 Lower Gastrointestinal Physiology& Endoanal Ultrasound (10 Credits)	Compulsory	1,2,3,4,	1,2,4	1,2,4	1,2,3,4,5
CVR8018 Urodynamic Science 1 (10 credits)	Compulsory	1,2,3,4	1,2,4	1,2,4	1,2,3,4,5
CVR8020 Urodynamic Science 2 (30 Credits)	Compulsory	1,3,4	1,2,3,4,5	1,2,3,4	1,2,3,4,5