

Nottingham Trent University Programme Specification

Basic Programme Information

1	Awarding Institution:	Nottingham Trent University
2	School/Campus:	School of Science and Technology
3	Final Award, Programme Title and Modes of Study:	MRes Medical and Materials Imaging Full time
4	Normal Duration:	12 months
5	UCAS code:	PHYS022

6 Overview and general educational aims of the programme

This programme is designed to further your knowledge and standing by studying and carrying out research at the frontier of the subject and to give you the skills needed to enter a career in Physical Sciences, Engineering or a related discipline either in an academic institution, a research institute or in the industrial/business sector. In particular, it will give you the opportunity to develop your practical and/or theoretical skills through an extended research project and will also enable you to develop an ability to plan and execute a research project, apply effective data analysis skills to your results, and communicate your findings in an articulate and professional manner.

This course is ideal if you are:

- a recently qualified graduate with the equivalent of an honours degree (2ii minimum) in Physics or a related discipline and are looking for the professional skills needed to enter a research career in an academic institution or in a physics related industry;
- working in a physics or physics related industry and want a masters-level qualification to give you a competitive edge;
- a graduate of a general science degree with some physics content (such as relevant engineering, material science, forensic science etc.) and are interested in broadening your career options;
- a student in any one of these groups who is interested in a bridging degree programme between your undergraduate programme and doctoral study.

In summary, the programme seeks to satisfy several aims to:

- provide an intellectually challenging and professionally relevant programme at the forefront of academic research led by academic experts in their fields;
- introduce areas of modern Medical and Material Imaging research.
- produce postgraduates who are skilled in employing and adapting investigative techniques which are applicable to a range of scientific situations;
- develop the theoretical and practical skills needed to plan and execute an in-depth research project;
- encourage students to set their work in the wider context of their discipline;
- give students opportunities to deal with complex issues in a systematic and creative way and show originality in solving problems;
- encourage students to develop intellectual and communication skills necessary to present research findings in both written and verbal formats;
- enable students to develop practical and theoretical skills and the ability to analyse data via appropriate numerical and IT skills;
- equip students for the pursuit of independent study.

7	<p>Programme outcomes Programme outcomes describe what you should know and be able to do by the end of your programme if you take advantage of the opportunities for learning that we provide.</p>
<p>Knowledge and understanding. By the end of the programme you should be able to:</p>	
<ol style="list-style-type: none"> 1. Demonstrate an in-depth understanding of the advanced principles within a specialist area of imaging. 2. Gather, analyse, evaluate and critically appraise scientific data and information from a variety of sources; 3. Demonstrate the ability to develop a project to Masters level; 4. Exhibit a critical awareness of possible future research areas in the field; 5. Apply diagnostic, analytical, and creative skills to perform an unfamiliar task or to solve a complex problem within a specialist area of imaging. 	
<p>Skills, qualities and attributes. By the end of the programme you should be able to:</p>	
<ol style="list-style-type: none"> 1. Present advanced material and arguments clearly, concisely and correctly, in writing and orally, to a range of audiences; 2. Employ appropriate library, IT, numerical/mathematical and computational skills to progress project work at Masters level; 3. Take responsibility for planning and risk assessment of advanced laboratory procedures and be critical of outcomes, including limits of accuracy; 4. Demonstrate the ability to interact with others and to engage in team-working; 5. Manage own learning and to develop as a professional; 6. Demonstrate independence of thought and action. 7. Explain and give examples of what constitutes unethical scientific behaviour. You will be able to maintain the highest ethical standards, especially in relation to your research activities. 	
8	<p>Teaching and Learning Methods</p> <p>This programme is delivered by a combination of lectures, seminars, case studies and tutorials, laboratories and an in-depth research project. You will receive advice and training on data analysis and presentation skills in the Research Methodology and Ethics module but also in Medical Imaging and Materials and Security Imaging modules. You will also have opportunities to present your work in front of peers and academic staff. The programme emphasises and encourages independent learning and is structured to improve your ability to undertake high quality research and critical analysis</p> <p>The project is the main focus of the MRes programme in your chosen specialist area of imaging. You will be provided with detailed guidance on how to complete the to complete the project successfully, the milestones that must be achieved and the timescales involved.</p>
9	<p>Assessment Methods</p> <p>The programme utilises a variety of assessment methods to ensure that you can demonstrate your achievement of the course's learning outcomes. You will be assessed by a variety of different types of coursework and by formal examination. The Research Project module will involve the design, implementation and reporting of a major research task. You will also present your findings in the form of a poster and orally to your peers and to members of the Programme Team.</p> <p>You will be assessed in each module in a manner consistent with the aims, objectives and learning outcomes of the module. Assessed work will take one or more of the following forms:</p> <ul style="list-style-type: none"> • Research project report: This tests your ability to design and implement a research programme, and communicate its findings to an informed audience in a comprehensive thesis, written in an appropriate scientific style. • Formal laboratory report: This assesses your ability to carry out a laboratory experiment and report on the findings in a scientific manner, discussing assumptions, error bounds, etc. • Written assignment: This tests your writing skills. You are expected to consider

the scientific problems of the assignment topic and the way in which they have been resolved; this must be fully referenced from the current literature.

- **Formal report:** This is a written report in a form of a scientific paper, which includes an abstract, introduction, methodology, results, discussion and references. This provides you with experience of scientific research for journal and wider publication.
- **Poster presentation:** This is a written poster display of the findings of your research project of a specific taught module task. It tests your ability to synthesise arguments and present them in a highly condensed, accessible and pictorial form. You will need to defend the work verbally to members of the Programme Team.
- **Oral presentation:** You will be assessed on your ability to communicate cogently using appropriate visual aids. You will also be assessed on your ability to answer questions with knowledge and authority.
- **Formal examination:** Closed book examinations to assess your knowledge base and ability to integrate material under time constraints.

10 Programme structure and curriculum

This programme, which is comprised of 180 credit points (cp), may be taken on a full-time basis in one calendar year. The modules which make up the programme are as follows:

Medical Imaging (20 cp)

This module introduces the principles underlying a range of techniques and tools used in Medical Imaging and related image processing research, and demonstrates their applications and limitations. Your knowledge will be reinforced by seminar sessions and case studies. This knowledge could act as a foundation for a research project in Medical Imaging, should you decide to base your research in this area.

Materials and Security Imaging (20 cp)

The principles of Materials and Security Imaging and related image processing research are introduced in this module, together with a range of associated techniques and tools. Applications and limitations are given due consideration. Your knowledge will be reinforced by seminar sessions and case studies, and could act as a foundation for a research project in Materials or Security Imaging, should you decide to base your research in this area.

Research Methodology and Ethics (20 cp)

The module aims to provide an underpinning in research skills relevant to the independent study required for an MRes level project. You will learn how to develop research methods, evaluate critically and summarize scientific literature relevant to your chosen project. And to deliver oral presentations and research proposals. There will also be sessions involving critical appraisal of scientific papers and the preparation of poster presentations. The module also considers ethical issues in relation with relation to scientific research.

Research Project (120 cp)

The aims are to plan and execute an experimental or theoretical investigation, under supervision, and to analyse critically the results and draw valid conclusions.

You will evaluate the level of uncertainty in your results, produce an error analysis and compare these results with expected outcomes, theoretical predictions or with published data, as would be the case for a piece of work aimed at being published in a peer reviewed scientific journal.

The final goal is to communicate your work to a scientific audience, both in a written and oral ways.

The overall pass mark for the programme is 50%, but if you achieve 60-70% overall you will be awarded MRes with Commendation, or MRes with Distinction if you obtain a final marks aggregate of 70% or above.

11 Admission to the programme

We wish to attract highly motivated and committed students who are seeking to gain skills and professional expertise in imaging. We are interested in professionals in public or private sector organisations wishing to obtain further qualifications or you may have just completed a Physics degree or an allied discipline (Engineering, materials, Chemistry, Forensic Science, environmental science) to a high standard and wish to carry out an extended research project on a full-time basis. We are also keen to recruit students looking for a bridging degree between undergraduate general science degrees and PhD work.

All recruitment and admission procedures will be conducted in accordance with the University's policy of Equal Opportunities for all students. You will have to complete an application form and provide two references. UK and equivalent International qualifications are acceptable. You will normally be expected to meet the following requirements:

- to hold a degree in a physics, Engineering, or related discipline. The minimum degree classification for entry to the Mres programme will normally be at least the equivalent of a 2ii UK Honours degree.
- wider qualification and experience may be acceptable. Each case will be considered on its individual merits at the discretion of the Admissions Panel.

A good command of spoken and written English is an essential requirement for the programme. If you are an overseas applicant from a non-English speaking country, the minimum recommended requirement is the British Council IELTS grade 6.5 or its equivalent. Equivalent experience may include the successful completion of a non-UK degree in the English language or a significant period of residence/work placement in an English speaking country, for which evidence should be provided.

12 Support for Learning

You will receive considerable support throughout this programme from administrative staff, the academics and the Programme Leader. New entrants will receive a 3 day induction programme at the beginning of the academic year. You will have a project supervisor who will give you guidance on all aspects of your research project. The University also has many support mechanisms to deal with non-academic problems. When you enrol on the programme, you will receive a comprehensive Student Handbook, which includes information on:

- programme aims, outcomes and content;
- access to university resources (Libraries and Learning Resources, C & IT, Student Support Services, Careers Advisory and Employment Service, accommodation services, Student Union etc.);
- regulations for student conduct;
- regulations for health & safety;
- academic and pastoral support;
- careers

The Student handbook also includes guidance on:

- time management;
- writing and submitting assignments, taking tests and assessment criteria;
- guidance on completing a Student Progress File;
- Detailed guidance is also provided for each module.

13	<p>Graduate destinations/ employability</p> <p>Nottingham Trent University has an excellent record in employability of graduates and is consistently at the top of the league tables in employment. The University's Careers Service has an enviable reputation for helping our graduates find employment and offers individual consultations.</p> <p>There is a wide range of career opportunities in physics related industries or the degree may serve as an entry route into PhD studies.</p> <p>If you are already in employment and are seeking to further your career within an organisation, this programme will give you the skills you need to achieve it and to bring added value to your organisation.</p>
14	<p>Programme standards and quality</p> <p>The Course Committee, with staff and student representatives, operates to discuss matters arising in the programme, reviews module feedback and considers the course report and external examiners comments. You will be represented on this committee by student representatives, elected by the students. An external Examiner offers further quality control through monitoring academic standards, moderation of assessment tasks and processes. The overall responsibility for quality control lies with the School Academic Standards and Quality Committee whose remit is to provide guidance and support to academic programmes.</p> <p>Student feedback is collected on each module and discussed and this is reported on in the module leaders' report. The module leaders' reports are used to evidence the Programme Standards and Quality Report, which is written annually. The PSQR is considered at a meeting of the School of Science and Technology Academic Standards and Quality Committee where issues are noted and actions taken to alleviate the issues are reported back.</p> <p>The external examiner reports annually on the standards and quality of the programme.</p>
15	<p>Assessment regulations</p> <p>This programme is subject to the University's Common Assessment Regulations (located in its Academic Standards and Quality Handbook). Any programme-specific assessment features are described below:</p>
16	<p>Additional Information</p> <p>Collaborative partner(s):</p> <p>Programme referenced to national QAA Benchmark Statements:</p> <p>Programme recognised by:</p> <p>Date implemented:</p> <p>Any additional information:</p>
	<p>The QAA descriptors for a qualification at Masters (M) level: Masters degree, have informed the design of this programme.</p> <p>1st September 2010</p>