

Nottingham Trent University Course Specification

Basic Course Information

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| 1 Awarding Institution: | Nottingham Trent University |
| 2 School/Campus: | Science and Technology/Clifton |
| 3 Final Award, Course Title and Modes of Study: | MRes Mathematical Sciences
Full time |
| 4 Normal Duration: | 1 calendar year |
| 5 UCAS Code: | |

6. Overview and general educational aims of the course

Do you want to tackle cutting-edge research problems in Mathematics or Statistics? Do you want to work in a team of world-class researchers? Well, this course is designed to fully prepare you for continued academic research in a topic at the frontier of Mathematical Sciences. From day one, your supervisor, an expert in your chosen field, will welcome you into the stimulating research environment of the team where you will be treated like an equal and expected to participate in regular tutorials, discussions and seminar presentations. As well as gaining a deep understanding of a current hot topic in Mathematics or Statistics, you will acquire skills in independent and group working, critical thinking, project planning and professional communication, making you highly employable in finance, computing, consultancy or teaching.

This course is ideal if you are:

- a recent graduate with at least a 2i honours degree in Mathematics or a related discipline, looking for the in-depth knowledge and professional skills needed to enter a research career in an academic institution or in a related industry;
- working in a mathematical sciences related industry and want a post-graduate qualification to provide you with a competitive edge;

In summary, the course 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 Mathematical Sciences research.
- produce postgraduates who are skilled in employing and adapting investigative techniques which are applicable to a range of situations;
- develop the theoretical and practical skills needed to plan and execute an in-depth research project;
- 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. Course outcomes

Course outcomes describe what you should know and be able to do by the end of your course if you take advantage of the opportunities for learning that we provide.

Knowledge and understanding

	By the end of the course you should be able to:
K1	Display a comprehensive understanding of knowledge, and a critical awareness of current research at the forefront of a chosen field within Mathematical Sciences;
K2	Demonstrate a critical understanding of the research methods required to propose, plan, and perform cutting-edge research which has the potential to contribute to the body of published knowledge in the chosen field.
K3	Understand how to efficiently access and critically appraise specialist literature at the forefront of the subject.
	Skills, qualities and attributes By the end of the course you should be able to:
S1	Select, adapt and apply appropriate mathematical and statistical techniques to complex problems, including in new or unfamiliar environments, and critically evaluate and interpret the results.
S2	Plan, undertake and communicate the progress and findings of an independent, extended Project at the forefront of a chosen field within Mathematical Sciences.
S3	Work constructively and cooperatively as an individual and as a team member, accepting accountability for performance and exercising a range of interpersonal and professional skills.
8	Teaching and Learning Methods
	<p>This course is delivered by a combination of lectures, seminars, tutorials, computer laboratories and an in-depth research project. You will receive advice and training on literature searching and presentation skills in the Research Methodology and Ethics. You will also present and discuss 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 Mathematics or Statistics. You will be provided with detailed guidance on how to complete the the project successfully, and will take ownership of the milestones along the way and and planning the timescales involved.</p> <p>The research project is the main focus of the MRes course. If you are a full-time student, you will have the opportunity to carry out a project in a world-leading research group at Nottingham Trent University; The principal means of delivering the taught aspects of the course is by lectures and guided reading, supported by the University's virtual learning portal and other electronic facilities; Workshops will also be used, in which you will be required to undertake independent work and examination of case studies for discussion and development with colleagues, academic staff and practitioners; You will be given extensive guidance and practice in written and oral presentation skills with appropriate feedback; You will also get extensive guidance and practice in the design, execution and reporting of research investigations, and this will be put into practice in the project;</p> <p>The modules you will study are designed and delivered by the research-active members of the team, so you know that the material you are learning is right at the cutting edge. We also encourage your attendance at regular research seminars both within and outside the School.</p> <p>During the course of your studies, you will assemble a Progress Portfolio, which you can use to reflect on the skills and attributes which you acquire. This Portfolio will provide evidence to help you when completing your CV, and when applying for jobs at the end of the course.</p>

9	<p>Assessment Methods</p>
	<p>The course uses a variety of assessment techniques to ensure that you can demonstrate a range of learning outcomes. Formative assessment of your knowledge, understanding and presentation will be given during allocated slots in the teaching course. Summative assessment of the course may be by a combination of a variety of in-course assessment methods including oral presentations, written essays, and written critiques of published papers. Some modules will also be assessed by examination in addition to the in-course assessment. The Research Project module will involve the design, implementation and reporting of a major research task. You will communicate your findings at an interim stage of the project in peer-reviewed journal format and you will present your findings orally to your peers and to members of the Course Team.</p> <p>Assessed work will take one or more of the following forms:</p> <p><u>Research Project dissertation</u></p> <p>This Project dissertation assesses your ability to design and implement a course of research, and communicate the findings to an informed audience in a comprehensive thesis, written in an appropriate scientific style.</p> <p><u>Written assignments</u></p> <p>These test your writing skills. You are expected to consider the problems of the assignment topic and the way in which they have been resolved; this must be fully and appropriately referenced from the current literature.</p> <p><u>Oral presentation</u></p> <p>This assesses your oral communication skills. 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.</p> <p><u>Poster presentation</u></p> <p>This is a written poster display of the findings of your research project or of a specific taught module task. It tests your ability to synthesize arguments and present them in a highly condensed, accessible and pictorial form. You will need to defend the work verbally to members of the Course Team.</p> <p><u>Formal examination</u></p> <p>Examinations are used as a means of ensuring your ability to integrate material and apply previously learned knowledge under time constraints.</p> <p><u>Progress portfolio</u></p> <p>The progress portfolio allows students to collate evidence of the progress of their research project, including official signed documentation from formal meetings, informal presentations and planning and organizational skills.</p>
10	<p>Course structure and curriculum</p>
	<p>The MRes course is a one year full time course. The duration of the academic year comprises 50 weeks divided into 3 terms plus a summer period, with a number of modules delivered in term 1 and others in term 2, however the research project usually starts within a month of starting and continues until the end of August, with submission of the thesis and presentation of the research by poster in August and the final Research Paper in early September. The full year consists of 180 credits of modules. All your modules are 20 credits, except for the 120 credit Research Project. An indicative course structure is given below.</p>

Contact hours for 20credit taught modules are typically around 50 hours, with a further 150 hours expected from you for directed and independent study.

You will be given a choice of research topics or may approach staff with ideas of your own. The topic of the research is agreed with individual academic staff supervisors, and is exploited for assessments linked to the *Research Methodology & Ethics* module.

A number of modules can be chosen, but your project supervisor will strongly recommend that you take those which best support your research Project.

Core Modules

Research Project 120 credits

A full-time extended (9-10 months) research project in a chosen theme within Mathematical Sciences.

Research Methodology and Ethics 20 credits

Development of skills in how to plan, write and deliver oral presentations, posters and research proposals, find and appraise current literature.

Optional Modules (choose 2, with only one at Level 6, all 20 credits)

Pure Mathematics

- Coding Theory and Cryptography (Level 7)
- Topics in Pure Mathematics (Level 6)

Applied Mathematics

- Topics in Mathematical Biology (Level 7)
- Mathematical Recipes (Level 7 – not offered 2015)
- Linear Systems (Level 6)
- Numerical Analysis and Dynamic Systems (Level 6)
- Topics in Applied Mathematics (Level 6)

Statistics

- Computational Statistics and Data Analysis (Level 7 – not offered 2015)
- Statistical Modelling (Level 6)
- Applied Statistics (Level 6)

All taught modules run from September to June, most with final exams in May/June. The research Project runs for the full calendar year.

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Admission to the course

For admission to this course you will possess one of the following:

- an Honour's degree in a subject in Mathematics or a related discipline from a United Kingdom or equivalent University, the minimum degree category for entry to the course will normally be at least a 2.1, or its equivalent;
- Overseas applications will based on the NARIC equivalent of the above;
- a professional qualification of equivalent status;
- any other qualification and experience as the Admissions Panel shall deem equivalent in subject content and level of attainment.

Additionally, overseas students will normally be expected to have a level of English language capability demonstrated by attainment of IELTS to grade 6.5, or 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. This requirement is made clear to the students in the course literature before they apply for the course. Students who marginally fail to reach the above criteria are expected to attend a pre-term English language course for overseas students, organised by Nottingham Trent University. Those who wish to continue improving their proficiency in English are encouraged to continue attending in-session courses run by the University's English Language support Unit.

The Course Leader will conduct an interview (either in person or over telephone/videoconferencing) with you to determine your suitability for the course and to discuss your research interests, matching you to academic expertise within the Team, and assigning an appropriate Project supervisor. Applicants will be offered places on a first-come first-served basis, and the Team will have the right to close the course to further applicants if all available Projects have been allocated. Although the Project allocations before arrival are not binding, there is an expectation that both supervisor and student will honour the choice.

12 **Support for Learning**

We will work with you to ensure that you settle into your new academic environment and that your studies go well, and you will find that there are lots of people to support you at Nottingham Trent University.

All students at Nottingham Trent University have full access to Student Support Services. In addition, School based support networks are in place to offer you support, guidance and advice on academic and personal issues. Within the course, students experience the full support of the Biosciences Academic Team. The Academic Team Leader, with support from the Courses Manager, Course Leader, Module Leaders, and Course Tutors, take responsibility for student support and guidance. The Module Leader will offer guidance and support to students taking each specific module.

Academic staff can be contacted by e-mail, telephone, letter, or in person.

As a new student you will experience an initial week long induction period at the commencement of the academic year. Induction will inform you about:

- Student Support Services at University, School and Course level;
- International Student Support
- University policies and procedures on academic systems;
- Personal development planning;
- Timetable issues, room allocations and location;
- University, School and Course Handbooks;
- Enrolment procedures;
- Computing, IT and Library services;
- Health and Safety procedures.

This initial week will be followed up with additional course events throughout the year to ensure that you are progressing well and that there are no barriers to you succeeding.

In keeping with the aims of the course, you will be treated as researchers rather than taught UG students. You will be immersed in the research environment of your chosen theme, and will find the most useful and immediate support from those working on similar problems, including post-docs, PhD students and other academics. With these peers, you will participate in Team meetings, attend research seminars and contribute to supervision meetings. The taught aspect of the course serves primarily to

	<p>support the research activity rather than to provide the student with a cohort identity.</p> <p>For accommodation matters, University Accommodation Officers will provide you with information, guidance and continuing support, for example hall of residence, private rented accommodation, and the Landlord Approval Scheme. The Accommodation Services can be accessed through www.ntu.ac.uk.</p>										
13	<p>Graduate destinations / employability</p> <p>There are a wide range of career opportunities available to MRes Mathematical Sciences. You will work with leading academics on your course, so you will have gained important academic and professional skills necessary to help you obtain employment in your chosen field. At the end of the course, you will also have developed many transferable skills that will make you more attractive to potential employers. The Research Project will give you the skills you need to follow a career in research and development.</p> <p>The University's Careers Service has an enviable reputation for helping our graduates find employment and offers individual consultations. Sessions are available to all students at NTU on CV writing and interview technique.</p>										
14	<p>Course standards and quality</p> <p>The Course Committee, with staff and student representatives, operates to discuss matters arising on the course, review module feedback and consider the course report and External Examiners' comments. Overarching responsibility for quality control lies with the School Academic Standards and Quality Committee whose remit is to provide guidance and support to academic courses. External Examiners offer further quality control through monitoring academic standards, moderation of assessment tasks and processes.</p>										
15	<p>Assessment regulations</p> <p>This course is subject to the University's Common Assessment Regulations (located in the NTU Quality Handbook). Any course specific assessment features are described below:</p> <p>The Masters degree is classified (Distinction, Commendation or Pass). The specific criteria for each classification will be set out in the course documentation and follow the grade based assessment scheme.</p>										
16	<p>Additional Information</p> <table> <tr> <td>Collaborative partner(s):</td> <td>None</td> </tr> <tr> <td>Course referenced to national QAA Benchmark Statements:</td> <td>Yes</td> </tr> <tr> <td>Course recognised by:</td> <td>N/A</td> </tr> <tr> <td>Date implemented:</td> <td>September, 2015</td> </tr> <tr> <td>Any additional information:</td> <td>None</td> </tr> </table>	Collaborative partner(s):	None	Course referenced to national QAA Benchmark Statements:	Yes	Course recognised by:	N/A	Date implemented:	September, 2015	Any additional information:	None
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