PROGRAMME SPECIFICATION (Taught Postgraduate)	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	MSc
4	**Programme Title**	MSc Statistics, MSc Medical Statistics
5	**Programme Code**	5518F, 5519F
6	**Programme Accreditation**	None
7	**QAA Subject Benchmark(s)**	Mathematics, Statistics and Operational Research
8	**FHEQ Level**	Level 7
9	**Last updated**	May 2025

10 Programme Aims

1 To develop the essential skills in statistics as required by academia and industry
2 To provide the fundamental knowledge and expertise in probability and statistics required to tackle complex statistical problems.
3 To provide an understanding of the most used and important computational methods, approaches and algorithms for the analysis of large and complex real-life data sets.
4 To develop research skills.
5 To encourage the development of creativity and problem-solving skills.
6 To develop skills in critical assessment, analysis and storage of information and/or data.
7 To provide a programme which meets the FHEQ at Masters level and takes appropriate account of subject benchmarks in QAA Mathematics, Statistics and Operational Research at the Masters level and UK professional standards.
8 To provide a qualification enhancing employment prospects in Statistics (5518F), respectively Medical Statistics (5519F).

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.

The programme outcomes have references to the benchmark statements for Mathematics, Statistics and Operational Research.

Knowledge and Understanding

On completing the programme students should be able to demonstrate:

A1 An understanding of fundamental concepts in probability and statistics.
A2 An understanding of data management, integration and handling.
A3 A broad knowledge of the computational and statistical methods for dealing with large and complex data analysis problems.
A4 Knowledge of current tools and technologies pertaining to Statistics.
A5 An understanding of the most used statistical algorithms, their underlying assumptions and limitations.
A6 Advanced knowledge and understanding of chosen specialist areas in Statistics.
A7 An understanding of the principles of statistical modelling and inference so that students can tailor and adapt the ideas to address applied statistical problems through their subsequent academic study or careers.

For students on the Medical Statistics (5519F) programme:

A8 Advanced knowledge and understanding of chosen specialist areas in Medical Statistics.
A9 An understanding of the principles and theory which underlie Medical Statistics so that students can appreciate the current state of these subjects and can adapt to continued rapid developments through their subsequent careers.

Teaching and Learning Methods

Fundamental and specialist knowledge (A1-A9) are imparted largely through direct student contact (lectures and tutorials), supplemented by practical sessions that may take the form of computing sessions, problem solving and assessed coursework, and project work.

Student understanding and learning is enhanced using computing and numerical exercises, problem solving, literature reviews, and practical work.

Independent learning is encouraged through the provision of reading lists, literature reviews and critical analysis of research papers, and ready access to online information sources. Adequate time is provided in all modules for private study for independent learning.

The dissertation module will enable students to devote extensive time to developing a deep understanding of a specialist area.

Assessment Strategy

A mix of formative and summative strategies are used to assess problem solving and programming skills, along with the ability to design and carry out research projects.

Additional formative feedback, provided both in-person and online, is included to provide student feedback throughout the course, without contributing to module marks. Formal feedback is provided for each piece of assessed coursework.

Summative strategies, in the form of project work, problem solving exercises, class tests and written exams, are used to assess a student's learning achievements, for key modules.

Intellectual Skills

On completing the programme students should be able to:

B1 Propose, carry out and write up an extended research project involving, where appropriate, a literature review, problem specifications, design, implementation, and analysis.
B2 Describe and explain the mathematical and statistical theory underpinning modern statistical methods.
B3 Apply their knowledge of specific computational, mathematical and statistical techniques to the storage and analysis of data.
B4 Have expertise in the use and applicability of up-to-date programming languages and software tools.
B5 Construct and analyse appropriate statistical models using data and other information sources.

Teaching and Learning Methods

Intellectual skills (B1-B5) are imparted by a combination of lectures, practicals, problem classes, case studies, and an in-depth research project tailored to individual interests.

Modules are designed to augment formally taught material with more directed self-learning – particularly for the modules involving Advanced Topics in Semester 2 -- including the use of interactive tutorials (both tutor and student led), self-directed study, laboratory practicals, problem-based learning and investigative work.

Tutorials are used to focus on specific research topics in detail, to carry out problem solving exercises (B1) and critical analysis of the current software libraries (B4), analytical techniques (B3) and research literature, to ensure up-to-date knowledge of subject-specific research fields.

Assessment Strategy

Intellectual skills (B1-B5) are assessed through written reports, unseen exams, practical write-ups, oral presentations, a poster presentation and a research thesis.

The assessment methods aim to evaluate the students' understanding and ability to apply the necessary statistical techniques.

The combination of practical-based in-course assessment along with unseen examination, ensures that learners are assessed on both their practical skills and theoretical knowledge of the subject discipline (B3, B5).

Practical Skills

On completing the programme students should be able to:

C1 Critically evaluate research and literature relating to the chosen specialism (Statistics or Medical Statistics).
C2 Present, store and query data.
C3 Apply methods to characterise and manipulate data sets for modelling and classification.
C4 Apply appropriate statistical software to analyse data sets and interpret the results.
C5 Effectively communicate insights derived from data sets and data models

Teaching and Learning Methods

Critical evaluation of current research will be developed through literature searching, through coursework exercises and in the research project in particular (C1).

The ability to solve computational and statistical problems (C2-C4) will be acquired through practical sessions and self-directed learning.

Problem solving exercises will be used to improve student skills in the application of appropriate statistical methods to data handling and analysis (C1-C5).

Assessment Strategy

Practical skills (C1-C5) are primarily assessed continuously in the form of individual reports from practical studies and the project dissertation.

Data and information handling and interpretation are a strong component of many modules and are also assessed through continuously assessed problem solving exercises.

Transferable/Key Skills

On completing the programme students should be able to:

D1 The ability to communicate complex and technical ideas orally.
D2 The ability to construct technical written documents meeting both academic and professional standards.
D3 Problem solving skills, taking complex and abstract concepts and data, evaluating critically and synthesizing evidence-based conclusions.
D4 Creativity skills, such as drawing insights from data and distilling meaning beyond algorithmic applications of established methodologies.

Teaching and Learning Methods

Oral presentation skills are exercised by the preparation of oral presentations on specific research topics (D1).

Written communication skills are developed during independent study, the preparation of coursework, poster presentation and through the completion of the project dissertation (D2).

Problem solving skills are exercised through the problem-solving assessments, and more fully developed through the extended research project at the end of the programme (D3).

Creativity skills are developed through data visualisation, problem-solving and user driven development in project work (D4).

Assessment Strategy

Oral communication skills are assessed in oral presentations.

Written communication skills are assessed by report preparation and the project work.

Independent work is assessed in research projects.

Problem solving skills are assessed through in course problem solving exercises and the project dissertation.

Creativity is assessed through problem-solving exercises and poster preparation.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

The MSc comprises a 12-month programme taught over two semesters (taught component) and a third semester focused on the project and dissertation (research project).

The programme is centred in the School of Mathematics, Statistics and Physics, where the students will be based. Due to the interdisciplinary nature of the course, several modules are delivered by members of the Population Health Sciences Institute within the Faculty of Medical Sciences.

The programme consists of compulsory and optional modules, and a major individual project and dissertation. The programme provides comprehensive training in Statistics/Medical Statistics.

The taught component of the course accounts for 120 credits and the Research Project 60 credits. The ***taught component*** of the course is split across Semester 1 and Semester 2.

Semester 1 modules build the basic grounding in and understanding of probability and statistics. Two compulsory modules (30 credits each) run from Week 1 to Week 11. These modules are assessed through formative and summative coursework, continuously throughout Semester 1, with an unseen exam in the January exam period.

Semester 2 introduces optional modules that build key research skills and encourage deep learning by building on, and applying, the fundamental knowledge gained in Semester 1. Learners will have the choice of a variety of advanced modules in statistics and medical statistics (with the medical statistics modules being compulsory for students on the Medical Statistics programme)

Semester 3. Students will undertake a project and dissertation. The project may be based in a research group within the University, or in collaboration with a sponsoring industry organisation or employer.

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

The MSc in Statistics (respectively Medical Statistics) will deliver trained postgraduate students who have advanced knowledge, understanding and skills that will equip them for a career in Statistics (respectively Medical Statistics) or industry more broadly.

The MSc in Medical Statistics is particularly tailored to prepare students for a career in academic health research or the pharmaceutical industry.

Particular features of these programmes are:

Flexibility: A distinctive feature of these programmes is their flexible structure, operating within the University's modular system in which students choose from a wide range of optional modules in Semester 2 and can choose an area of specialisation based on their research project. The choices available provide either a broad statistical education or a general statistical background followed by more specialised study of chosen areas.

Project Work: Opportunities are provided to undertake a project with industry, working alongside organisations such as the National Innovation Centre for Data (NICD).

Programme regulations (link to on-line version)

5518F-5519F

13 Support for Student Learning

Generic information regarding University provision is available at the following link.

Generic Information

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

Generic information regarding University provision is available at the following link.

Generic Information

Accreditation reports

Additional mechanisms

15 Regulation of assessment

Generic information regarding University provision is available at the following link.

Generic Information

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

The University Prospectus: Find a Degree | Postgraduate | Newcastle University (ncl.ac.uk)
Degree Programme and University Regulations:
https://www.ncl.ac.uk/regulations/programmeregsandspec/

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.