PROGRAMME SPECIFICATION (Taught Postgraduate)	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	MSc
4	**Programme Title**	Master of Science in Biomedical Engineering
5	**Programme Code**	5204F
6	**Programme Accreditation**	IMechE (2025)
7	**QAA Subject Benchmark(s)**	Engineering
8	**FHEQ Level**	7
9	**Last updated**	May 2024

10 Programme Aims

This degree programme (for suitably qualified graduates from engineering and science first degree backgrounds cognate to mechanical and electrical and electronic engineering as well as physics, including medical physics) aims to:

1. Develop their knowledge, understanding and skills, as well as awareness and "know how", in the field of Biomedical Engineering with a focus on the application of engineering principles in that environment so that as Masters graduates they will be equipped to enter employment as professional engineers (progressing on to Chartered Engineer or equivalent status) or in other professional careers, providing the engineering industry and professions (in the UK and elsewhere) with employable and enterprising graduates who have an appreciation of the value of education to the wider community.

2. Prepare for engagement in life-long learning (e.g., professional CPD or further Higher Education) with capability in critical enquiry, research and knowledge acquisition through studying in depth a range of aspects of modern Biomedical Engineering, with exposure to specialist modules covering issues such as design for human-systems integration, biomaterials and tissue engineering, orthopaedic engineering, bioelectronics and medical devices regulatory requirements.

3. Gain an internationally recognised qualification which meets the requirements of the Framework for Higher Education Qualifications at Masters Level 7 with particular reference to the QAA Subject Benchmark Statement for Engineering (Annex MEng degrees) and to the Engineering Council UK statement on Applicability of Output standards to Masters degrees.

4. For non-native speakers of English, extend their English language skills appropriate to the application of Biomedical Engineering in engineering and industry through experience of life and study in a UK Higher Education institution.

5. Achieve the above in the contexts of the School, SAgE Faculty and University business plans, following the University's policies and procedures and conforming to the relevant sections of the QAA Code of Practice.

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 Engineering and to Engineering Council UK Spec Learning Outcomes.

Knowledge and Understanding

On completing the programme students should have:

A1 An advanced level of knowledge and understanding of the relevant underlying biomedical engineering principles, practices, materials, components and systems for this field of advanced study.

A2 A good awareness (sufficient for critical evaluation and effective application) of relevant terminology, concepts and practices in this field of specialisation, including those from various engineering disciplines and from outside engineering.

A3 Knowledge of current and developing practices in the field of specialisation, with critical awareness of the constraints on and limitations of these, leading to the potential for continuous improvement and the emergence of new approaches. (QAA Q1)

Intellectual Skills

On completing the programme students should be able to:

B1 Critically evaluate the state-of-the-art in the specialist field and apply their specialist knowledge to identify potential opportunities for improvement or innovation in the field. (QAA Q4)

B2 Exploit acquired relevant knowledge innovatively in the application of appropriate methods or solutions for processes, products or systems in the specialist field. (QAA Q3)

B3 Apply relevant research and information retrieval, data collection and analysis and systematic engineering methods and models appropriately to new or uncertain or complex problems in the field of specialisation. (QAA Q2 & Q5)

B4 Apply relevant knowledge to support informed decisions with complex or uncertain problems or risks in the field of specialisation. (QAA Q5 & Q9)

Practical Skills

On completing the programme students should be able to:

C1 Assess effectiveness of planning and evaluate implementation progress towards solutions and designs.

C2 Operate within the professional context of safe systems of work and compliance with relevant codes of practice and conduct in ways that promote sustainability

Transferable/Key Skills

On completing the programme students should have demonstrated:

D1 Independent learning ability, self-direction and autonomy leading to the ability to continue to develop their knowledge, understanding and skills through further professional development. (QAA Q6, Q7 & Q10)

D2 Ability to communicate effectively in English presenting and discussing their work with others in the field of specialisation.

Teaching and Learning Methods

Key elements of professional Masters graduate employability are that employers need to be sure that graduates are able to take individual responsibility for their own and others' work without supervision, that they are capable of assimilating and organising complex information quickly and effectively and that they are self-learners, capable of keeping

abreast of new developments without organisational support. Our approach to teaching and learning is designed to produce Masters graduates who meet these criteria. From the outset, students will be expected to meet the basic professional requirement of taking responsibility for their own learning.

With engineering degrees, lectures are extensively used to provide structure for each subject, to help to direct students' further reading and self-study, to convey how the underlying engineering science is applied to discipline specific problems and to demonstrate approaches to problem-solving. Typically, student self-study after lectures is supported by tutorial or problem classes, where advice is given on request to students who have issues arising from their application or understanding of the lecture material. Other types of classes include longer "hands-on" practical laboratory/workshop/computer sessions, seminar/presentation activities and project work where teamwork often features.

There is an expectation that students will manage their own learning, with seminar classes in which students present material they have researched themselves and independent work on assignments prevalent. Students undertake a major 60 credit individual project related to the specialist stream they are following. The Accrediting Institutions place a high importance on this project which must be passed to get the Degree.

Assessment Strategy

Professional practice in industry demands the ability to bring methods and data together, apply problem-solving skills and demonstrate understanding under time constraints. To reflect this, the major unseen written examination remains a valid assessment tool and forms an important element in our assessment strategy. However, there are equally many disciplines and skills where it is restrictive or inappropriate and engineering degrees are noted for the breadth of assessment tools that are used to obtain a balanced measure of the student. Spot or phase tests (including MCQ) and short assignments help students structure their study and revision towards the synoptic end-of-module examinations. Laboratory/workshop, design and computing work are all best assessed through realistic assignments, with many of these being team assignments and involving oral or poster, as well as written reporting. Application of major engineering software features in most main technical subject areas.

12 Programme Curriculum, Structure and Features

Basic structure of the programme

This is a full-time, one year (three semesters) programme, starting in September, leading to the award of the degree of Master of Science (MSc).

The taught component of the programme consists of a total of 120 credits (1 credit = 10 study hours, including timetabled contact hours and private study) studied during Semesters 1 and 2 (September to June). Students begin preliminary work (e.g., literature review etc.) on their 60 credit major project in Semester 1, with work continuing throughout the year with an intermediate assessment point at the end of Semester 2 and being completed in Semester 3 (June – September). Project work must be submitted for assessment in August.

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

The desirability of multi-disciplinary learning is a national priority noted by EPSRC. One key feature of this programme is its inter-disciplinary nature, achieved by modules being taught using expertise across Faculties. Another key feature, though, is that in addition to biomedical engineering modules, the fully defined programme taught content includes medical devices regulatory requirements, orthopaedic engineering, and bioelectronics to produce graduates who should be capable of delivering product solutions as well as engaging in research and development.

Programme regulations (link to on-line version)

5204F: -R5204F

13 Support for Student Learning

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

Generic Information
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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

Mechanisms for gaining student feedback
Feedback is channelled via surveys, the Student-Staff Committee and the Board of Studies.

Faculty and University Review Mechanisms
Every six years degree programmes in each subject area undergo Learning and Teaching Review. This involves both the detailed consideration of a range of documentation, and a review visit by a review team (normally one day in duration) which includes an external subject specialist and a student representative. Following the review a report is produced, which forms the basis for a decision by University Learning, Teaching and Student Experience Committee on whether the programmes reviewed should be re-approved for a further six year period.

Accreditation reports
Accreditation was given by IMechE in 2021. Accreditation is for 5 years and the next re-accreditation visit is due in 2025.

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: http://www.ncl.ac.uk/postgraduate/courses/

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

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education..