PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University Medicine Malaysia (Iskandar Puteri Campus) and Newcastle University
3	**Final Award**	BSc (Honours)
4	**Programme Title**	Biomedical Sciences
5	**UCAS/Programme Code**	1213U / B941
6	**Programme Accreditation**	Royal Society of Biology
7	**QAA Subject Benchmark(s)**	Biomedical Science; Bioscience
8	**FHEQ Level**	6
9	**Date written/revised**	May 2023

10 Programme Aims

The academic aims of the programme are as follows:

- To produce graduates who have a sound knowledge and understanding of the Biomedical Sciences.
- To produce graduates who have a core knowledge and understanding in the subject areas of physiology, biochemistry, molecular genetics, immunology, microbiology, human anatomy and pharmacology**.**
- To produce graduates who have a multidisciplinary approach to understanding the functioning of the human body in health and disease and a knowledge of current major advances in the scientific understanding of human health and disease.
- To develop students' intellectual and general transferable (key) skills including the ability to communicate effectively, to use digital and library resources appropriately, to prioritise work and to meet deadlines, to work alone and with others, to adopt a creative approach, use initiative and solve problems, to use critical and analytical skills to analyse biological questions of interest, propose solutions and to critically assess alternatives.
- To produce graduates who have well developed practical skills in relation to the biosciences, have an awareness of good practice in laboratory work and health and safety, and are able to apply quantitative and qualitative analysis to biological investigations and presentational skills including data analysis and statistics.
- To produce Honours graduates who are capable of carrying out independent research.
- To produce graduates who have an understanding of ethical reasoning and the ethical issues associated with current biomedical research.
- To provide a flexible programme which leads to a qualification which meets the criteria for an Honours degree laid down in the Malaysian Qualifications Framework, the Quality Assurance Agency's (QAA) National Qualifications Framework, UK and which fully meets the QAA Benchmarking Statement in Biosciences.
- To produce graduates capable of working in a wide variety of careers, including 1) careers in biomedical and related sciences in research, development, and education; 2) graduate careers in which there is greater emphasis on non-subject specific skills; 3) further advanced study.

Aims in relation to the needs of stakeholders:

The programme aims to ensure that our graduates are equipped with a current understanding and knowledge of their subject area and those specific practical skills that meet the needs of the employers of bioscientists. The emphasis on the development of both intellectual and transferable skills ensures that our graduates are also well equipped for the broader non-specialist graduate job market. The inclusion of vocationally related components and

emphasis on career development throughout the programme enhances the employability of our students. Successful completion of the year-long placement and the further enhanced employability this brings is immediately recognisable in the name of the degree.

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 Biosciences and Biomedical Sciences.

Knowledge and Understanding

On completing the programme students will have:

A1. Gained a core knowledge and understanding of the biomedical sciences and a variety of related disciplines.
A2. Gained a knowledge of the scope of the subject area.
A3. Gained an in-depth knowledge of selected areas of biomedical sciences up to current research level and developed an understanding of the experimental basis of this knowledge.

Teaching and Learning Methods

The teaching and learning strategy is designed to encourage a progressive acquisition of knowledge and understanding. The first three semesters of the programme are concerned with providing core knowledge and understanding of the subject specialism. The later parts of the programme aim to develop students' knowledge of the breadth and scope of the biomedical sciences and an in-depth knowledge of selected areas of their disciplines and of the experimental basis of this knowledge up to the current research level (A2, A3). There is a gradual change of emphasis over the three years from strongly supported teaching, such as lectures which provide the core themes, the scope of the knowledge and understanding required, and explanation of concepts to a greater use of study groups and more independent self-directed learning from the scientific literature.

The importance of a solid foundation of maths, biology and chemistry knowledge to successful studies is emphasised by the use of formative tests in each of these subject areas during the first few weeks of stage 1. Students use the tests to identify key areas that need support and are directed to remedial on-line and other forms of support material.

Knowledge and understanding are further promoted by seminars and coursework (A1, A2, A3), which allow students to explore material in more depth and to exchange ideas with staff and fellow students. Practical classes reinforce the taught curriculum (A1, A2). A3 is promoted through individual student projects and in-depth analysis of current research literature.

Students are provided with extensive, prioritised reading lists as well as digital resources and they are expected to use these to supplement the taught material, and to prepare for seminars. Seminars allow for students to check their knowledge and understanding, and to develop their ability to apply this to novel situations. Study groups are used to reinforce the learning process and develop students as independent learners. Regular MCQ tests and feedback on laboratory reports and essays enable students to monitor the progress of their learning and understanding. In the final year capstone experience (research project) students are supported by one-on-one supervision to apply their knowledge and understanding to the development of hypotheses which can be critically analysed using independently sourced information.

Assessment Strategy

Knowledge and understanding are primarily assessed via unseen written examinations. Understanding and the ability to apply knowledge is further assessed by coursework. The weighting of examination and coursework varies as appropriate to the module and most modules include some aspect of formative assessment.

The format of the unseen examination also varies as appropriate to the module and the level of study but can include Extended Matching Item (EMI) and multiple-choice questions (MCQ), structured short answer questions (SAQ), essays, problem solving, literature and data analysis.

The coursework element can include practical write ups/laboratory reports, study group tasks, oral presentations, posters, in course tests (normally MCQ or EMI), extended essays, timed essays.

Peer review is sometimes employed in the assessment of study group tasks and presentations.

Practical Skills

On completing the programme students will have:

B1. Mastered essentials of basic laboratory skills, safe working practices and the ability to carry out experiments accurately and responsibly.
B2. The ability to obtain, record, collate, analyse and interpret data from experiments.
B3. The ability to summarise and present such data according to scientific conventions.
B4. Developed the ability to use primary literature and bibliographic databases.
B5. Developed the ability to evaluate critically scientific information.
B6. Developed the ability to undertake independent, in-depth, research in a specific area of the biomedical sciences.

Teaching and Learning Methods

The core experimental skills of laboratory work and data handling (B1, B2 and B3) are progressively developed throughout the programme through a series of practical classes. Practical classes are supported by research fellows who undergo compulsory training offered by the laboratory team at NUMed.

Laboratory practical classes and seminars throughout the programme encourage students to evaluate critically scientific information in a range of forms (data from their own experiments, published papers and problem-solving tasks). Students are introduced at Stage 1 to a Laboratory Code of Practice, where safety and responsibility in the laboratory are outlined. Students develop these skills further through the Practical Skills modules at Stage 2.

Students are provided in their first and second year with training in the use of bibliographic databases including PubMed and Medline and referencing systems including Endnote. Laboratory practical classes and seminars throughout the programme encourage students to evaluate critically scientific information in a range of forms (data from their own experiments, published papers and problem-solving tasks). The ability to undertake research in relation to the subject specialism is developed progressively from group-based tasks early in the programme to individual in-depth research projects in the final year (B6).

Attendance at laboratory practical classes is compulsory and feedback on laboratory work and practical reports reinforces students' acquisition of basic experimental skills (B1-B3). All submitted practical work must be presented according to scientific conventions. Feedback on assessed course work requiring the student to search bibliographic databases reinforces this skill (B4). Study Group tasks and seminars are used to encourage students to develop the confidence to evaluate critically scientific information and students are provided with feedback on these activities (B5). Feedback on study group-based and individual assignments enables students to improve their research skills and this is further reinforced at an advanced level by one-to-one supervision of research projects by experienced, research active academic staff (B6).

Assessment Strategy

At stage 1, students will be required to demonstrate a basic level of practical skills competence via a Practical Skills Test (B1). Practical reports require students to demonstrate the skills associated with experimental work (B1-3), and these are further assessed at

advanced level by the project supervisor's assessment of the student's competence, the project report and oral presentation. Written assignments throughout the course will assess students' ability to undertake research and to use bibliographic databases (B4, B6) and this is further assessed in the project reports. The ability to critically evaluate scientific information (B5) is assessed by various written assignments and seminar presentations, by the project reports and by unseen examination.

The ability to work independently in the research active environment (B6) is primarily assessed by the Stage 3 project supervisors' assessment of competence and professionalism and the ability to show originality in the application of knowledge.

Intellectual Skills

On completing the programme students will have:

C1. An ability to read and use scientific literature with a full and critical understanding, addressing content, context, aims, objectives, quality of information and its interpretation and application.
C2. An ability to critically evaluate information and data from a variety of sources, to interpret quantitatively and qualitatively scientific information, and to explain complex scientific ideas in written, visual and oral form.
C3. An ability to assess the value and limitations of existing knowledge and experimental techniques.
C4. An ability to use and integrate several lines of evidence to formulate key hypotheses, to test hypotheses using logical and consistent quantitative and qualitative arguments, and to identify key data in these processes in order to solve scientific problems.
C5. Developed skills of independent learning.

Teaching and Learning Methods

Intellectual skills (C1-C5) are progressively developed throughout the programme by practical and seminar work, study group tasks, and the research projects. These skills are assessed via a range of coursework assignments including written exercises, seminar presentations and study group tasks. Unseen examinations further test the students' cognitive skills

At all stages students are encouraged to consider critically and evaluate information and experimental data from a wide variety of sources, including textbooks, the internet, and primary sources of scientific literature (C1-C5). In Stage 3 students undertake research projects which support the development of all of the cognitive skills (C1-C5) and students are supported in this by one-to-one supervision. In seminar discussions students are supported in critically interpreting and discussing some of the latest scientific developments in relation to their subject with experts in the various fields of research and in developing skills of problem-solving in relation to complex material through the application of knowledge and understanding (C1-C5).

Assessment Strategy

Intellectual skills are assessed via a range of coursework assignments including written exercises, seminar presentations and study group tasks. Unseen examinations further test the students' cognitive skills. The research projects have an important role in assessing all of the cognitive skills, including the ability to use scientific literature in a critical manner (C1), the ability to evaluate, interpret and explain complex information from a range of sources (C2), assessing the limitations of existing knowledge (C3), integrating several lines of evidence and testing hypotheses (C4), the ability to deal with complex issues systematically and the skills of independent learning (C5).

Transferable/Key Skills

On completing the programme students will have:

D1. Study skills of reading, noting, recall and essay/report writing.
D2. Gained competence in the use of digital skills including e-mail, word processing, spreadsheets, presentation and statistical software, use of the Internet and on-line library facilities.

D3. Developed the ability to work independently.
D4. Developed interpersonal skills, including team-working.
D5. Developed the ability to plan, organise and prioritise work activities.
D6. Developed skills of written, oral and visual presentation.
D7. Demonstrated the ability to develop and work towards targets for personal, academic and career development.
D8. Applied their knowledge and skills to solve scientific problems.
D9. Demonstrated the ability to use initiative and creativity, allied to critical thinking and analytical skills, to analyse biological questions of interest.

Teaching and Learning Methods

Skills of reading, noting, recall and essay/report writing (D1) are developed through study skills support sessions, and tasks including directed reading and essays on which formative assessment is provided. Skills in the use of digital resources (D2) are developed through classes at various stages throughout the course and practised in a wide range of coursework. Skills of independent working (D3) are progressively developed by assignments throughout the programme. Students are initially encouraged to learn through group-based tasks and then through individual assignments culminating in the research project. Planning, organising and prioritising (D5) are developed through study skills support sessions and the project. The skills of written, oral and visual communication are developed in seminars and in the research project (D6). Students are challenged with increasingly complex scientific problems that they will resolve using their knowledge and skills (D8), initiative and creativity (D9).

Interpersonal skills (D4) are developed through study group work, team working exercises, seminars and the research project. The ability to develop and work towards targets for personal, academic and career development (D7) is developed through a programme of Career Management sessions and use of NU Reflect.

Students are encouraged to explore with their personal tutor the development of their study skills (D1) and, where appropriate, additional counselling with the Senior Support Officer at Newcastle University Medicine Malaysia will be arranged. Students are provided with feedback on tasks requiring the use of digital skills (D2). Students are encouraged to reflect on their team-working skills and feedback on these are provided by peer-assessment of group tasks. Skills of planning, organising and prioritising are developed by a progressively more complex series of assignments, culminating in the research projects. Students are encouraged to reflect on these skills and individual support is available from personal tutors and the Stage 3 project supervisors. Students are enabled to monitor the development of their written, oral and visual presentational skills by feedback from peer and teachers on various assignments. Students are encouraged to discuss their personal goals with their tutors. All students are required to prepare and obtain feedback on a curriculum vitae in their second year. Students are encouraged to undertake appropriate work placements in Malaysia to explore further their career goals. One-to-one supervision of the Stage 3 project encourages students to develop their ability to exercise sound judgement and to operate independently demonstrating responsibility and initiative in a working environment.

Assessment Strategy

Transferable/key skills D1 to D9 are all assessed via coursework e.g., study group tasks, posters, oral presentations, and essays. An assessment schedule including deadlines is set for all modules and students are penalised for late submission of work (D5). The projects have a key role in assessment of all of these skills including problem solving (D8), report-writing (D1), oral and poster presentation (D5) and digital skills including advanced word processing and the use of PowerPoint (D2). The project supervisors are asked to assess students' inter-personal skills (D4) and skills of planning and organisation (D5), as well as the ability to exercise sound judgment and show personal responsibility and initiative in the environment of the research laboratory (D7). A students' NU Reflect record is used to assess their ability to work towards targets for personal and professional development (D7).

12 Programme Curriculum, Structure and Features

Basic structure of the programme

Duration of course: 3 years full time based on 30 weeks attendance per annum.
Number of stages: 3
Total credits: 360

The first two years of the programme will be offered at the Newcastle University Medicine Malaysia (Iskandar Puteri campus) and the final year of the programme will only be offered at Newcastle University UK.

Requirements for progression:

1) For transfer to the UK, after the second year of studies, all students must satisfy all UK Border Agency requirements for the issue of confirmation of acceptance of studies (CAS) documentation and for the issue of a Tier 4 visa allowing study in the UK.

Students who do not progress on the programme due to either failing modules or not meeting UKBA requirements will be awarded the appropriate level award. Students who have completed their second year of studies but who have not met UKBA requirements for entrance to the UK will be advised as to potential local partners who may accept such students onto the final year of the programme(s) that they offer.

Module credits: range from 10 to 40 with each 10 credits representing 100 hours of study

To be offered at Newcastle University Malaysia (Iskandar Puteri Campus):

Stage 1 provides a multi-disciplinary foundation covering a range of related biosciences, including biochemistry, cell biology, genetics, immunology, microbiology, physiology, and pharmacology and the analytical techniques used in each of these fields to test and confirm our knowledge base. Students gain an appreciation of each of these specialisms. At Stage 1, students are introduced to those practical skills essential for studying biomedical sciences and must pass a Practical Skills Test to evidence these skills. The students are also exposed to concepts of ethical reasoning and students also develop a number of generic skills including information literacy, writing skills, numeracy skills, oral presentation skills and data handling skills. To allow students to evaluate their understanding and knowledge base of maths, biology and chemistry there are three separate formative tests that students are encouraged to use. Students identify areas needing improvement and are then directed at an early stage to on-line and other forms or support material to ensure they are appropriately prepared to study the content of stage 1 of the degree. The chemistry test in particular will evaluate the student's understanding of basic atomic theory and structure, matter, bonding, thermodynamics, types of chemical reaction and reaction kinetics, acids, bases and buffers, gases, nomenclature and terminology used in chemistry and in particular organic chemistry.

Stage 2 semester 1 builds on Stage 1 and provides students with a deeper knowledge of cell and molecular biosciences with correlations to molecular medicine. The course focuses on the technologies that underpin our current understanding in these areas and provides students with hands-on experience of a range of modern molecular techniques. The course also explores how bioinformatics helps make sense of the ever-increasing amount of biological data.

Cell biology is studied in greater depth, particularly focusing on transcription, membrane transport, cell signalling and immunology with reference to the development and presentation of human disease.

At Stage 2 semester 2 provides greater specialisation in a range of biomedical related modules that investigate the science of human health and disease. Further emphasis is also given to developing the practical skills of students in those techniques considered important for Biomedical Science graduates. At Stage 2 students also enhance their research and presentation skills, data handling, and team-working.

To be offered at Newcastle University (UK) only

At **Stage 3** students further develop their research skills as they undertake a research project supported by a research-active supervisor. They also study advanced topics in Biomedical Sciences that reflect the current research of this field. Students are able to select options that consolidate a theme or equally a diverse range of modules that give a breadth of knowledge.

Students also elect an optional vocational module aligned to their career, future study, or development aspirations.

Students also have the option to study a supernumerary language module in their second and third year.

Assessments

All assessments on the BSc (Hons) Biomedical Sciences programme offered at Newcastle University Medicine Malaysia will be identical to those that will be set at Newcastle University, UK. All examinations will take place at the same time and date in both Malaysia and the UK. The only exception to this will be the timing of the year 2 resit examinations in Malaysia which are earlier than the UK to allow sufficient time for marking and for the marks to be released to students in time for students to apply for CAS and to make visa applications. This will ensure that students can commence their 3rd year studies at the start of year 3 semester 1.

Links between learning outcomes, curriculum and structure of the programme

The modules that comprise this degree programme are shown in the annex. Further detail can be seen in the module outline forms, which also show how the modules contribute to development of skills throughout the programme.

The curriculum is designed to allow systematic progression of students towards the programme's learning outcomes. Knowledge and understanding is progressively developed as students move from a broad overview of their subjects at Stage 1 to a much more specialised and detailed understanding at Stages 2 and 3 with the placement year providing the students who opt for this experience to put this knowledge into context. Practical techniques are also progressively developed throughout the course as students' progress from competence in basic laboratory skills to the use of sophisticated laboratory techniques and equipment. For those who chose it, the professional placement year also provides unique opportunities not available in the university. Cognitive and intellectual skills are also developed throughout the programme from simple problem-solving exercises at Stage 1 to more complex data handling and experimental design and data analysis at Stages 2 and 3, culminating in the research project that requires students to develop a highly critical approach to the scientific literature and to their own independently sourced data/information. Students who have completed the professional placement year will be able to bring their experience and skills to Stage 3. Key skills are also progressively developed, being first introduced to the students (e.g., in formal lectures or seminars) and then practised and assessed in subsequent modules.

Thus, Stage 1 provides a firm grounding in the basic sciences underpinning the biomedical sciences. By the end of this Stage the students will have:

- gained a basic knowledge and understanding of subject areas within Biomedical Sciences (A1) and started to use this knowledge to address simple scientific problems (D8)
- been introduced to basic laboratory skills, safe working practices and recording and interpretation of experimental results (B1-3)
- developed skills of independent learning (C5)
- developed study skills of reading, noting and recall (D1)
- gained competence in the use of digital skills (D2)
- have developed the ability to work independently (D3)

At Stage 2 the course gives a broad overview of subject material considered essential to the subject of Biomedical Sciences and starts to introduce the research basis of the acquired

knowledge. By the end of this stage students will have:

- developed further, at the level presented in undergraduate textbooks, knowledge and understanding of the major areas that are the 'core' of their disciplines (A2)
- experienced use of primary literature (B4)
- mastered essential elements of relevant laboratory techniques and safe laboratory practice and developed the ability to write laboratory reports (B1-B3)
- started to develop the ability to evaluate critically scientific information (B5) and to appreciate the relationship between research and knowledge gain in the discipline (B6)
- continued the development of transferable (key) skills, including the ability to use digital resources for information retrieval and data handling (D2, B4)
- further developed study skills of reading, noting and recall (D1) have developed the ability to work independently (D3)
- developed the ability to plan, organise and prioritise work activities (D5)
- been introduced to skills of scientific essay writing (D1) and oral and visual communication (D6)
- improved cognitive skills of reasoning, analysis of scientific literature, critical evaluation and the ability to apply their knowledge in problem-solving (C1-C4, D8-9)
- developed further skills of independent learning (C5)
- developed inter-personal and team-working skills through collaborative work (D4, D9)

At Stage 3, a higher level of specialisation is achieved with students being able to choose between different areas of interest in relation to some of their taught modules and their research project. By the end of this stage the students will have:

- extended their knowledge and understanding of Biomedical Sciences up to the current research level and developed an understanding of the experimental basis of this knowledge (A3)
- become fully competent in the use of primary literature and bibliographic databases, and have an improved ability to evaluate critically scientific information (B4-5)
- developed the ability to make oral and visual presentation of scientific data and knowledge (D3)
- developed skills of critical evaluation of scientific information (B3) and have acquired research and analysis skills (B6)
- produced project work that demonstrates a range of skills including subject-specific skills (B1-B6), report-writing (D1), digital skills (D2), independent working (D3), inter-personal skills (D4), planning, organising and prioritising (D5), problem solving (D8-9), presentation skills (D6), in-depth knowledge of selected areas (A3), and cognitive skills (C1-4)
- had further opportunities to practise a variety of transferable (key) skills that will be valuable for a range of employment opportunities.

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

A major strength of the programme is the close linkage between teaching and research. The majority of teaching staff are research active, collaborate with members of the NU Faculty Research Institutes and teach in areas relating to their particular expertise. This ensures that the curriculum content is kept up-to-date and the links between scholarship and research are explicit throughout the programme. Furthermore, the continued participation of teaching staff in professional development programmes (e.g., Advance HE, UKPSF) ensures that delivery of teaching is informed by up-to-date practice. The strong research base in the Faculty ensures that the most modern equipment is available to undergraduate students for their practical work. Involvement of teaching staff for the programme on committees of national professional bodies helps to ensure that the programme continues to be informed by external developments.

A distinctive feature of the course is a full-time final year research project which provides an important opportunity for students to develop their practical skills at the highest level. All

modules are supported by staff affiliated to the research institutes within the Faculty; this allows students to study in depth areas of particular interest that relate to Newcastle's research strengths.

Students will be offered the opportunity to transfer to one of the following BSc (Hons) programmes: BSc Biochemistry; BSc Biomedical Genetics; BSc Biomedical Sciences and Medical Microbiology; BSc Physiological Sciences; BSc Pharmacology, offered by Newcastle University UK after their first year of study provided that the following entrance requirements are met: 1) the entrance criteria for the degree programme offered at Newcastle University UK has been achieved; 2) all other academic requirements are met to allow such transfer 3) students must satisfy all UKBA requirements for the issue of confirmation of acceptance of studies (CAS) documentation and for the issue of a Tier 4 visa allowing study in the UK. All students considering such transfer will also be made aware that they will be required to pay the full international student academic fees of Newcastle University UK. Students on the BSc (Hons) Biomedical Sciences at Newcastle University Medicine Malaysia may also apply for transfer onto the MBBS programme offered at Newcastle University Medicine Malaysia only. This will be a competitive scheme with a limited number of places as determined by the CEO of Newcastle University Medicine Malaysia. Students will be selected on the basis of academic performance in year 1 of the BSc (Hons) Biomedical Sciences programme, a personal statement and an interview. Successful students will enter the first year of the MBBS programme.

The programme places a strong emphasis on employability of its graduates, not only via the placement or professional placement year, but also via part time paid employment in one of the research laboratories during their second year of study. This may involve either laboratory work or other areas of interest (e.g., science communication). Students are also encouraged to take advantage of the international exchange opportunities offered by the School which include exchanges for the final year research project in a number of international institutions. Optional modules at stage 3 also allow students to specialise in a number of subject-related vocational topics such as business, communication, and ethics.

Programme regulations (link to on-line version)

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13 Support for Student Learning

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

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15 Regulation of assessment

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

The University Prospectus: http://www.ncl.ac.uk/undergraduate/degrees/#subject
The 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.