PROGRAMME SPECIFICATION	

1	**Awarding Institution**	Newcastle University
2	**Teaching Institution**	Newcastle University
3	**Final Award**	MSci
4	**Programme Title**	Biomedical Sciences
5	**UCAS/Programme Code**	B900
6	**Programme Accreditation**	N/A
7	**QAA Subject Benchmark(s)**	Biomedical Science; Bioscience
8	**FHEQ Level**	7
9	**Date written/revised**	July 2014

10 Programme Aims

The programme aims to recruit high-flying students who are committed to a career in science. The fourth year, which offers a choice of M level modules (40 credits) together with a substantial laboratory project (80 credits) will allow students to acquire higher level knowledge in selected disciplines aligned to the research strengths of the Faculty and to gain additional practical laboratory experience to prepare them for a research-based career.

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 knowledge of selected areas of the biomedical sciences at a level at the forefront of the discipline
- 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 IT and library resources appropriately, to prioritise work and to meet deadlines, to work alone and with others, to use initiative and solve problems, to use critical and analytical skills to analyse problems, 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 graduates who are capable of working independently in the laboratory to undertake a research project
- To produce graduates who have shown originality in the application of knowledge, and understand how the boundaries of knowledge are advanced through research
- To produce graduates who are able to design and conduct experiments to test a hypothesis
- 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 a Masters degree laid down in the QAA's National Qualifications Framework and which fully meets the Quality Assurance Agency Benchmarking Statement in Biosciences and the Benchmarking Statement in Biomedical Sciences, except those elements of the Benchmark Statements for Biomedical Sciences which relate specifically to the provision of accredited status of the Institute of Biomedical Sciences.
- To produce graduates with the qualities needed for employment in circumstances requiring sound judgment, personal responsibility and initiative, in complex and unpredictable professional environments
- To produce graduates capable of working in a wide variety of careers~~,~~ ~~including~~: 1) careers in biomedical and related sciences in research and development 2) careers in education 3) graduate careers in which there is greater emphasis on non-subject specific skills and 4) for 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 employers of bioscientists. In addition the emphasis on the development of both intellectual and transferable skills also ensures that our graduates are well equipped for the broader non-specialist graduate job market. The inclusion of vocationally-related components and emphasis on career development throughout the programme ensures the employability of our students

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 should 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 their biomedical sciences up to current research level and developed an understanding of the experimental basis of this knowledge.

A4. Shown originality in the application of 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 a core knowledge and understanding of biomedical sciences. 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 and of the experimental basis of this knowledge up to the current research level (A2, A3). The 4th year of study promotes students' ability to show originality in the application of knowledge (A4), through M level modules including both taught material and a major research project. There is a gradual change of emphasis over the four 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. Knowledge and understanding are further promoted by seminars, tutorials and coursework (A1, A2, A3, A4), 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 and A4 are promoted through individual student projects and in-depth analysis of current research literature. Students are provided with extensive, prioritised reading lists and internet sites and they are expected to use these to supplement the taught material, and to prepare for seminars and tutorials. 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 research projects students are supported by one-on-one supervision to apply their knowledge and understanding to the development of hypotheses which can be tested experimentally.

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 (including the use of Blackboard and interactive computer packages).

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 essay questions, 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 EMI or MCQ), extended essays and timed essays.

Peer review may be employed in the assessment of study group tasks and presentations.

Practical Skills

On completing the programme students should 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 critically evaluate scientific information.

B6. Developed the ability to undertake independent in-depth research in relation to a specific area of the biomedical sciences and are capable of working independently in the laboratory

B7. Have shown originality in the application of knowledge, and understand how the boundaries of knowledge are advanced through research

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 postgraduate demonstrators who undergo compulsory training offered by the School of Biomedical Sciences.

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 module at stage 2 and further by selecting the Human Anatomy or Practical and Presentation Skills in Biomedical Sciences modules in semester 2 of stage 2. Students are provided with an opportunity to develop these skills further and

design and execute their own experiments through a laboratory-based experimental design project at Stage 3. Students are provided in their first and second year with training in the use of bibliographic databases including PubMed and Medline. 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. Attendance at laboratory practical classes is compulsory and feedback on laboratory work and practical reports reinforces students' acquisition of basic experimental skills (B1-3). 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 research active, experienced, academic staff. In this process students are guided to apply their own knowledge in order to design experiments to test hypotheses.

Assessment Strategy

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, and the project reports, poster 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. At Stage 3 students are required to complete a laboratory based experimental design project. At Stage 4 students are required to complete a laboratory-based research project. The projects are assessed via a written dissertation, oral presentation and a supervisor's assessment of the competence and professionalism shown in the conduct of the project.
The ability to work independently in the laboratory (B6) is primarily assessed by the Stage3 and Stage4 project supervisors' assessment of competence and professionalism and the ability to show originality in the application of knowledge (B7) is assessed primarily through the project dissertations.

Intellectual Skills

On completing the programme students should 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.
C5. Developed skills of independent learning.
C6. An ability to deal with complex issues systematically and creatively, and to show originality in tackling and solving problems.

Teaching and Learning Methods

Intellectual skills (C1-6) are progressively developed throughout the programme by practical work, study group tasks, seminar work, written work and the research projects.

Learning Strategy

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 and Stage 4 students undertake research projects which support the development of all of the cognitive skills (C1-C6) 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-C6).

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 to show originality in approaches to problem-solving (C6) 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 IT skills including e-mail, word processing, spreadsheets, presentation 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. Developed the ability to develop and work towards targets for personal, academic and career development.
D8. Developed the ability to exercise sound judgment, personal responsibility and initiative, in complex and unpredictable professional environments.

Teaching and Learning Methods

Skills of reading, noting, recall and essay/report writing (D1) are developed through study skills support sessions, and tasks included directed reading and essays on which formative assessment is provided. Skills in the use of IT (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 projects. Planning, organising and prioritising (D5) are developed through study skills support sessions and the projects. The skills of written, oral and visual communication are developed in seminars and in the research project (D6). Interpersonal skills (D4) are developed through study group work, team working exercises, seminars and the research projects. 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 the use of e-portfolio. The Stage 4 research project supports the development of the ability to exercise sound judgment, personal responsibility and initiative in the complex professional environment of a working research laboratory (D8).

Students are encouraged to explore with their personal tutor the development of their study skills (D1) and, where appropriate, additional counselling with the Faculty Study Skills Adviser is arranged. Students are provided with feedback on tasks requiring the use of IT 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 of these skills and individual support is available from personal tutors and the Stage 3 and Stage 4 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 and record these meetings on the e-portfolio system. Students are encouraged to undertake appropriate work placements, particularly at the end of the second year, to further explore their career goals. One-to-one supervision of the Stage 3 and Stage 4 projects 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 D7 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 report-writing (D1), oral presentation (D5) and IT 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' e-portfolio record is used to provide evidence of 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: 4 years full time based on 30 weeks attendance per annum.

Number of stages: 4

Total credits: 480

Module credits: range from 10 to 80; with each 10 credits representing 100 hours notional student leaning time

Requirements for progression: passing all core modules and gaining appropriate overall number of credits. Students must also attain a weighted average of at least 60% at the end of Stage 2 and Stage 3 and a mark of at least 60% in each strand of the Stage 3 experimental design project module (CMB3001). Students failing to achieve this standard will be transferred to the three year BSc honours degree programme in Biomedical Sciences.

Stage 1 provides a multi-disciplinary foundation covering a range of related biosciences, including Biochemistry, Cell Biology, Genetics, Immunology, Microbiology, Physiology, and Pharmacology. Students gain an appreciation of each of these areas and at the end of Stage 1 students may opt to transfer to another Bioscience programme if they so wish. At Stage 1 students are introduced to those practical skills essential for studying biomedical sciences, ethical reasoning and students also develop a number of generic skills including information literacy skills, writing skills, numeracy skills oral presentation skills and data handling skills All Stage 1 modules are essential for progression to Stage 2 and are therefore deemed to be core modules. Thus a fail mark in any of these modules will neither be carried nor compensated.

Stage 2 semester 1 builds on Stage 1 and provides students with a deeper knowledge of Molecular Medicine and Cell and Molecular Biosciences. 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

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molecular techniques. The course also explores how bioinformatics and statistics help make sense of the ever-increasing amount of biological data. Cell Biology is studied in greater depth, particularly in relation to membrane transport and signalling and the cell and molecular biology of the immune system. Emphasis throughout is on how knowledge of these areas can help in the understanding of human biology and disease. The three subject strands in the practical module in this semester (laboratory techniques, bioinformatics and statistics) must be passed to pass the module.

Stage 2 semester 2 provides greater specialisation. Topics include, human anatomy, the nervous system, respiratory diseases and students have the option to study in an area of their choice; either the immune system in human disease, and viral pathogens or the biology of ageing. 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 are also introduced to research skills, and other important skills including data handling, presentation skills and team-working.

At **Stage 3** students further develop their research skills as they undertake a laboratory-based experimental design project. They also study advanced topics, and have a choice of three optional modules from: chronic and nutrition-related disease, cancer biology and therapy, genetics of common diseases, disease of the human nervous system, clinical ageing and health, medical biotechnology, microbiota and pathogens; mucosal microbiota, protozoa and fungi and immunology of health and disease. Students also elect an optional vocational module, choosing either research in biomedical sciences, bioethics, healthcare organisation and practice, science communication or business for the bioscientist.

Students also further develop their skills of experimental design and critical analysis of scientific data, as well as presentation and IT skills.

Students also have the option to study a range of supernumerary modules in their second and third year including a range of language and career development modules.

At **Stage 4** taught modules are selected from a wide range available at M level within the faculty. These modules are linked to research institutes and include options in cancer biology, gerontology, neurosciences, and the genetics of complex diseases. A feature of the final year is a major research project undertaken within a research institute in the Faculty of Medical Sciences.

Links between learning outcomes, curriculum and structure of the programme

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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. Superimposed on the modules, there is a key skills strand running throughout the four stages of the programme that introduces students to library skills, IT skills, communication and presentation skills and careers management.

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, 3 and 4. 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. 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 at Stage 4 that requires students to develop a highly critical approach to the scientific literature and to their own experimental data. Key skills are also progressively developed, being first introduced to the students (e.g. in a formal lecture or workshop session) 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 basic knowledge and understanding of subject areas within Biomedical Sciences (A1)
• 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)
• been introduced to e-mail, word processing, library facilities, e-portfolio and use of the Internet (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 text books, knowledge and understanding of the major areas that are the ‘core’ of biomedical sciences (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 (B1-3)
• 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 computers 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 (C1-4)
• developed further skills of independent learning (C5)
• developed inter-personal and team-working skills through collaborative work (D4)

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

• through core and optional modules, 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)
• 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 through a laboratory-based experimental design project (B6)
• produced project work that demonstrates a range of skills including subject-specific skills (B1-B6), report-writing (D1), IT skills (D2), independent working (D3), inter-personal skills (D4), planning, organising and prioritising (D5), presentation skills (D6), the ability to develop and work towards targets for personal, academic and career development (D7), in-depth knowledge of selected areas (A3), originality in the application of knowledge (A4) and cognitive skills (C1-6)
• had further opportunities to practise a variety of transferable (key) skills that will be valuable for a range of employment opportunities.

In **Stage 4** students study two modules of choice from a range of Masters level modules available. They also undertake a substantial (80credit) research project allowing them to develop to a higher level their subject-related, cognitive and key skills. By the end of this stage students will have:

• Further extended their knowledge and understanding of biomedical sciences in selected areas up to the current research level, developed an understanding of the experimental basis of this knowledge, and shown originality in the application of knowledge (A3 and 4)
• Developed a sound appreciation of how the boundaries of knowledge, particularly scientific knowledge, are advanced through research (B7)
• Developed and demonstrated an ability to work independently in the laboratory (B6)
• Developed an ability to deal with complex problems systematically, creatively and with originality (C6)

• Developed the ability to develop and work towards targets for personal, academic and career development (D7)
• Developed the ability to exercise sound judgement, personal responsibility and initiative in a complex and unpredictable professional environment (D8)
• Produced project work that demonstrates a range of skills including subject-specific skills (B1-B7), report-writing (D1), IT skills (D2), independent working (D3), inter-personal skills (D4), planning, organising and prioritising (D5), presentation skills (D6), in-depth knowledge of selected areas (A3), and intellectual skills (C1-4)

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 and as such are members of the Faculty Research Institutes (Institute for Cell and Molecular Biosciences, Institute of Cellular Medicine, Institute of Health and Society, Institute of Genetic Medicine, Institute of Neuroscience and Northern Institute for Cancer Research) and virtually all teaching staff are also research active 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 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 the extended final year research project which provides an important opportunity for students to develop their practical skills at the highest level. The optional modules at Stage 3 and the M level modules at Stage 4 are offered by various research institutes within the Faculty and allow students to study in depth areas of particular interest that relate to Newcastle's research strengths.
The programme also places a strong emphasis on employability of its graduates, particularly within the biomedical and related sciences. Students may apply for part time paid employment in one of the research laboratories during their second year of study. Students are also encouraged to undertake a placement in the vacation at the end of Stage 2 and Stage 3. 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. These include an opportunity to study for a Semester abroad at Monash University in Australia, summer research placements in Singapore and Australia. Optional modules at stage 3 also allow students to specialise in a number of areas and gain an understanding of business issues relating to the pharmaceutical and biotechnology industries.

Programme regulations (link to on-line version)

http://www.ncl.ac.uk/regulations/programme/

13 Criteria for admission

A Levels
AAA- AAB including Biology. Chemistry is required at AS level (minimum grade B) if not offered at A level. GCSE Mathematics and English Language required (minimum grade B) if not offered at A or AS level. General Studies, Use of Mathematics, Communication and Culture and Critical Thinking not accepted.

Scottish Qualifications
AAAAA-AABBB at Higher Grade including Biology and Chemistry. Mathematics and English Language required at grade 2 Standard Grade (or Intermediate 2 equivalent) if not offered at Higher Grade. Combinations of Highers and Advanced Highers accepted.

International Baccalaureate
35points with Biology and Chemistry at Higher Level grade 5 or above. Standard Level Mathematics or Mathematical Studies required at grade 4 if not offered at Higher Level.

Irish Leaving Certificate
A1A1A1A1B1 at Higher Level, including Biology and Chemistry.

Access Qualifications
Overall 60 credits are required with 45 at level 3. The level 3 units must be made up of 15 credits in Biology at Distinction, 15 credits in Chemistry at Distinction and a further 15 credits at Distinction.

PARTNERS - A Levels
BBB including Biology. Chemistry is required at AS level (minimum grade B) if not offered at A Level. GCSE Mathematics and English Language required (minimum grade B) if not offered at A or AS level. General Studies and Critical Thinking not accepted.

The PARTNERS Programme is Newcastle University's supported entry route for students from identified schools and colleges. Find out more about the PARTNERS Programme at http://www.ncl.ac.uk/partners/support/.

Cambridge Pre-U
D3, D3, D3 - D3, D3, M2 in Principal Subjects including Biology, and preferably Chemistry. GCSE Mathematics and English Language required (minimum grade B) if not offered at a higher level.

BTEC Level 5 HND, BTEC (PARTNERS) Level 3 Extended Diploma (formerly BTEC National Diploma)

Not acceptable for entry to this subject.

Additional Requirements

Level of English Language capability

Evidence of English language skills sufficient to complete the programme successfully is required. IELTS scores of no less than 6.5 in any component are the normal requirement.

14 Support for Student Learning

The Student Services portal provides links to key services and other information and is available at: *http://www.ncl.ac.uk/students/*

Induction
During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/ tutorials/etc. The International Office offers an additional induction programme for overseas students.

Study skills support
Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Numeracy support is available through Maths Aid and help with academic writing is available from the Writing Development Centre (further information is available from the Robinson Library).

Academic and Pastoral support
Each undergraduate and taught postgraduate student will be assigned a personal tutor.*
A personal tutor is one part of a wider network of advice and guidance available to students to support their personal and general academic development. The module leader acts as the first point of contact for subject-specific academic advice. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Student-Staff Committee, and/or at the Board of Studies. Within the academic unit, students may also receive additional academic and pastoral advice from a range of other student-facing staff including degree programme directors, dissertation/project supervisors, and administrative support staff.
*Arrangements may vary for students taking special types of provision.

The University also offers a wide range of institutional services and support upon which students can call, such as the Writing Development Centre, Careers Service and Student Wellbeing Service. This includes one-to-one counselling and guidance or group sessions / workshops on a range of topics, such as emotional issues e.g. stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Student Union operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

Support for students with disabilities
The University's Disability Support team provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies.

Learning resources
The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities.

All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-sessional language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange.

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

Module reviews
All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the Board of Studies and/or the School Teaching and Learning Committee. Student opinion is sought at the Student-Staff Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Learning, Teaching and Student Experience Committee.

Programme reviews
The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Learning, Teaching and Student Experience Committee. The FLTSEC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the

University Learning, Teaching and Student Experience Committee.

External Examiner reports
External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Learning, Teaching and Student Experience Committee. External Examiner reports are shared with institutional student representatives, through the Student-Staff Committee.

Student evaluations
All modules and stages* are subject to review by student questionnaires. Informal student evaluation is also obtained at the Student-Staff Committee, and the Board of Studies. The National Student Survey is sent out every year to final-year undergraduate students, and consists of a set of questions seeking students' views on the quality of the learning and teaching. The results from student surveys are considered as part of the Annual Monitoring and Review of the programme and any arising actions are captured at programme and School / institutional level and reported to the appropriate body.
*With the exception of intercalating years and the final stages of undergraduate programmes.

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

Faculty and University Review Mechanisms
Every six years degree programmes in each subject area undergo periodic 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

Additional mechanisms

16 Regulation of assessment

Course requirements
Progression is subject to the University's Undergraduate Progress Regulations (http://www.ncl.ac.uk/regulations/docs) and Undergraduate Examination Conventions (http://www.ncl.ac.uk/regulations/docs/2013.html). In summary, students must pass, or be deemed to have passed, 120 credits at each stage.

Limited compensation up to 40 credits and down to a mark of 35 is possible at Stage 2 and there are resit opportunities at all Stages, with certain restrictions. Students must also attain a mark of at least 60% in Stages 2 and 3 of the programme and at least 60% in each strand of the Stage 3 experimental design module (CMB3001) in order to progress to the next stage. Students failing to achieve the required standard at Stage 2 & 3 will be transferred to the three year BSc honours degree programme in Biomedical Sciences.

Weighting of stages
The marks from Stages 2,3 and 4 will contribute to the final classification of the degree
The weighting of marks contributing to the degree for Stages 2, 3 and 4 is 1:2:3.

Pass mark
The pass mark is 40% (years 1,2 and 3)
The fourth year is Masters level and the pass mark is 50%

Common Marking Scheme
The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions, namely

	Honours
<40	Fail
40-49	Third Class
50-59	Second Class, Second Division
60-69	Second Class, First Division
70+	First Class

The University employs a common marking scheme, which is specified in the Taught Postgraduate Examination Conventions, namely:

Role of the External Examiner
An External Examiner, a distinguished member of the subject community, is appointed by Faculty Learning, Teaching and Student Experience Committee, after recommendation from the Board of Studies. The External Examiner is expected to:

i) See and approve examination papers
ii) Review examination and coursework marking
iii) Attend the Board of Examiners
iv) Report to the University on the standards of the programme

In addition, information relating to the programme is provided in:
The University Prospectus: http://www.ncl.ac.uk/undergraduate/ The School Brochure: http://www.ncl.ac.uk/marketing/services/print/publications/ordering/) Degree Programme and University Regulations: http://www.ncl.ac.uk/regulations/docs/ The Degree Programme Handbook

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.

Annex

Mapping of Intended Learning Outcomes onto Curriculum/Modules

				Intended Learning outcomes			
	Module title	**Credits**	**Type**	**A**	**B**	**C**	**D**
Stage 1							
BGM1002	Biochemistry	15	Core	1	1,2.3	5	1,2,3
CMB1004	Cell Biology	15	Core	1	1,2.3	5	1,2,3
BGM1004	Genetics	15	Core	1	1,2.3	5	1,2,3
CMB1005	Practical Skills in Biomedical & Biomolecular Sciences 1	15	Core	1	1,2.3	5	1,2,3
PED1003	Pharmacology	15	Core	1	1,2.3	5	1,2,3
PDS1002	Physiology	15	Core	1	1,2.3	5	1,2,3
CMB1003	Microbiology &Immunology	15	Core	1	1,2.3	5	1,2,3
CMB1006	Practical Skills in Biomedical & Biomolecular Sciences 2	15	Core	1	1,2.3	5	1,2,3
Stage 2							
CMB2002	Cell & Molecular Biosciences	20	Com	1		1,2,3,4,5	1,2,3,4
CMB2003	Molecular Medicine	20	Com	1		1,2,3,4,5	1,2,3,4
CMB2004	Cell and Molecular Biology of the Immune System	10	Com	1		1,2,3,4,5	1,2,3,4
CMB2005	Practical Skills in Biomedical and Biomolecular Sciences 3	10	Com	1	1,2,3	1,2,3,4,5	1,2,3,4
BMS2011	The Nervous System and Respiratory Diseases	20	Com	1, 2	4,5	1,2,5	1,2,3,6
BMS201	Practical and	10	Com	1	1,2,3,4,	1,2,3,4,	1, 2, 3,

3	Presentational Skills in Biomedical Sciences				5,6	5	5,6
CMB2007	Human Anatomy	10	Com	1, 2		5	1, 2, 3, 4
BMS2012	Clinical Immunology and Viral Pathogens	20	Opt*	1, 2	4,5	1, 2	1,2,3,4,5,6
BMS2014	The Biology of Ageing	20	Opt*	1,2	4,5	1,2	1,2,3,4,5,6
	* Students select one 20 credit module						
Stage 3							
CMB3001	Experimental design and the process of research	40	Com		1,2,3,4,5,6	1,2,3,4,5	1,2,3,4,5,6,7
CMB3008	Integrated Biomedical Sciences	10	Com	2,3	2,4,5,6	1,2,3,4,5	1,2,3,4,5,6,7
BMS3010	Genetics of Common Diseases	20	Opt**	3	4,5	1,2,3,4,5	1,3,5,6
BMS3012	Cancer Biology and Therapy	20	Opt**	3	4,5	1,2,3,4,5	1,3,5,6
BMS3013	Disease of the Human Nervous system	20	Opt**	3	4,5	1,2,3,4,5	1,3,5,6
BGM3039	Medical Biotechnology	20	Opt**	3	4,5	1,2,3,4,5	1,3,5,6
BGM3017	Clinical Ageing and Health	20	Opt**	3	4,5	1,2,3,4,5	1,3,5,6
BMS3020	Chronic Disease	20	Opt**	3	4,5	1,2,3,4,5	1,3,5,6
MIC3046	Microbiota and Pathogens; Mucosal Microbiota, Protozoa and Fungi	20	Opt**	3,	4,5	1,2,3,4,5	1,3,5,6
BMS3014	Immunology of Health and Disease	20	Opt**	3	4,5	1,2,3,4,5	1,3,5,6
BMS3003	Business for the Bioscientist	10	Opt*	3	4,5	1,2,3,4	6
BMS3015	Healthcare Organisation and Practice	10	Opt*	3	4,5	1,2,3,4	6
BMS3016	Science Communication	10	Opt*	3	4,5	1,2,3,4	6
BMS3007	Research in Biomedical Sciences	10	Opt*	3	3,4,5	1,2,3	1,2,3,4,5,6

BMS3022	Bioethics	10	Opt**	3	4,5	1,2,3,4	6
* Students select one 10-credit module; **Students select modules to the value of 60 credits							
Stage 4							
BMS4099	Research Project	80	Com	3,4	1,2,3,4,5,6,7	1,2,3,4,5,6	2,3,4,5,6,7,8
Taught modules to the value of 40 credits from a range of M level modules available				3	4,5,7	1,2,3,4,5	1,3,5