

**PROGRAMME SPECIFICATION**

<b>1</b>	<b>Awarding Institution</b>	Newcastle University
<b>2</b>	<b>Teaching Institution</b>	Newcastle University
<b>3</b>	<b>Final Award</b>	MBiol
<b>4</b>	<b>Programme Title</b>	Biology (Cellular and Molecular Biology) Biology (Cellular and Molecular Biology) with Placement Year
<b>5</b>	<b>UCAS/Programme Code</b>	C7C1 1141U
<b>6</b>	<b>Programme Accreditation</b>	Not applicable
<b>7</b>	<b>QAA Subject Benchmark(s)</b>	Biosciences
<b>8</b>	<b>FHEQ Level</b>	Level 7
<b>9</b>	<b>Date written/revised</b>	August 2021

**10 Programme Aims**

1. Develop a thorough knowledge and understanding of organisms, including microbes, plants and animals; with an emphasis on the cellular and molecular basis of their biology.
  2. Introduce the main disciplines underpinning a full understanding of biology, including molecular biology, biochemistry, cell biology, physiology, genetics, ecology, evolution and systematics.
  3. Progressively develop the laboratory practical and analytical skills required for the study of cellular and molecular biology.
  4. Provide a curriculum enhance by an active research environment that engenders critical thinking.
  5. Stimulate a wide interest in biology including an awareness of how current developments may affect the present and future well-being of society and the planet.
  6. Provide graduate-level training in key skills, including the ability to communicate in a variety of ways and contents, utilise IT and library resources efficiently, process and interpret quantitative data, manage time effectively and work both independently and in teams.
  7. Provide a flexible programme covering all aspects of biology (with a cellular and molecular emphasis), incorporating the elements specified in the benchmark statement for Biosciences issued by the Quality Assurance Agency.
  8. Provide a programme of study which meets the FHEQ at level 6 at the end of Stage 3 and the FHEQ at level 7 at the end of Stage 4.
- For students on the Placement Year Programme:
9. Provide students with the experience of seeking and securing a position with an employer.
  10. Facilitate independent self-management and proactive interaction in a non-university setting.
  11. Provide a period of practical work experience that will benefit current academic study and longer term career plans.
  12. Enable students to ethically apply their knowledge and skills in the work place, reflect upon their development and effectively evidence and articulate their learning in relevant future settings.

## 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.

### Knowledge and Understanding

On completing the programme students should have:

A1 A knowledge of biology from the molecular to the organismal level.

A2 An understanding of the functioning of plants, animals and micro-organisms, with particular reference to the cellular, biochemical, molecular genetics and genomic levels of organisation.

A3 A knowledge of the diversity of living organisms and the principles underlying classification, with an understanding of evolutionary processes.

A4 An appreciation of how basic knowledge of cellular and molecular biology can be used for practical applications, with an emphasis on biotechnology.

A5 An appreciation of the broader significance and impact of recent advance in biological science on contemporary society and the future.

For students on the Placement Year programme:

A6 Apply personal and professional development strategies to prioritise, plan, and manage their own skills development and learning.

A7 Research, select and apply relevant knowledge aimed at enhancing their own skills and effectiveness in specific duties at their placement.

A8 Demonstrate an understanding of a work environment, how it functions and their contribution to it.

A9 Relate their work based learning to other areas of personal development, including academic performance

### Teaching and Learning Methods

#### *Teaching Strategy*

A1-A5 are principally imparted through lectures, enhanced and supplemented with co-ordinated practical work or additional learning delivered by means of appropriate CAL tasks, written assignments and seminars. Many of the lecture courses at Stages 3 and 4 are crucial in delivering A5 as they provide knowledge and insights at the 'cutting edge'. These also address the social and ethical aspects involved in A5.

#### *Learning strategy*

Throughout the taught component of the course, students are encouraged and expected to engage in independent study, and are supported in this by the provision of reading lists, handouts and direction to many library and web-based resources (including e-journals). Laboratory work, the writing of reports and the analysis and interpretation of collated data all aid the development of understanding.

### Assessment Strategy

Assessment is partly by unseen written examinations (essays, short answers, data interpretation, missing words, multiple choice) but also via coursework. Most modules at Stages 1 and 2 include some coursework, thus ensuring that elements of formative, as well as summative, assessment and a variety of assessment methods are employed. At Stage 3, the distribution of exam- and assignment-assessed work is more polarised between modules, although, as at Stages 1 and 2, each forms a major part of the whole stage assessment. Assessment at Stage 4 has a higher proportion of coursework, particularly through the research project.

### **Intellectual Skills**

On completing the programme students should have acquired

B1 The ability to use the scientific method by formulating and testing hypotheses and to identify key data which allow such tests to be made

B2 The ability to interpret and effectively summarise quantitative data to test hypotheses, including statistical analysis and interpretation.

B3 The ability to critically assess the value and limitations of existing information on a given subject and produce critical reviews of such information.

### **Teaching and Learning Methods**

#### *Teaching Strategy*

Cognitive skills (B1, B2) are introduced widely at Stage 1, with particular emphasis on these in the study skills module Academic and Professional Skills for the Biosciences. These skills are further developed at Stage 2 through an experimental design and statistics module specifically for biologists and repeatedly rehearsed at Stage 2 via practical classes and the ensuing preparation of reports. B3 is also specifically addressed in the study skills and in the experimental design and statistics modules. During Stage 3, B1-3 are all practised in Stage 3 with laboratory-based discovery modules and Biological Research Project, whilst the Biological Literature Review and the Biological Information Project are focused specifically on B3.

At Stage 4, B1-B3 are all practised in an independent biological research project.

#### *Learning Strategy*

Students are encouraged to acquire B1-2 skills early in the Stage 1 study skills module. They then have to rehearse these skills repeatedly in preparing a variety of laboratory and field practical reports at Stage 2. At Stage 2 modules with a focus on experimental design and statistics offer repeated opportunities for practice of B3. Intellectual skills B1-B3 are enhanced by the individual research project at Stage 3; which, dependent on project selection, will cover experimental design (B1), analysis of data (B2), or appraisal of the quality of the data collected (B3). The skills that students gain through the organisation, planning and execution of their Stage 3 project are further developed by the major research project in Stage 4.

### **Assessment Strategy**

All intellectual skills are assessed by means of coursework reports and/or small team outputs such as posters or talks in Stages 1 and 2. At Stage 3 some or all of B1-3 (depending on topic) are also examined by means of the dissertation. B1-3 are all assessed in Stage 4 through an individual research project.

### **Practical Skills**

On completing the programme students should have acquired:

C1 Skills in quantitative techniques, including statistical analysis

C2 Experimental skills including development of a hypothesis and the design, execution and evaluation of experiments using traditional and modern techniques and equipment

C3 An ability to obtain record and interpret data from experiments and information in various forms from the literature, including electronic sources.

C4 Critical evaluation of data and information in terms of its quality

C5 The ability to present data in written format according to accepted conventions for scientific communication

## Teaching and Learning Methods

### *Teaching Strategy*

C1, C3 and C4 are introduced at Stage 1 with the study skills module. Practical classes associated with many modules during the first two years and also wholly practical-based modules in Stages 2 and progressively develop C1, C2 and C3 which is greatly enhanced by the individual projects in Stage 3 and Stage 4. The projects also make a major contribution to C3, C4 and C5, as too does a specific Stage 2 module focussing on experimental design and statistics. From the first year, students are required, after appropriate guidance, to search the literature for information and submit all written work in an appropriate scientific format so that, by Stage 3 and 4, C5 and the literature searching skills of C3 are thoroughly integrated into all submitted work. Stage 4 includes modules that provide practical experience in a range of molecular and analytical techniques..

### *Learning Strategy*

Students are encouraged to develop appropriate quantitative and practical skills (C1-C4) by monitored attendance at and practice of skills in formal classes during the first two years and in the Laboratory Workshop at the start of Stage 3 and subsequently through practice and discussion with their supervisor as part of their Stage 3 and Stage 4 projects. From the first year all written work must be submitted in an appropriate scientific format and feedback on such work enhances learning of the skill outlined in C5.

## Assessment Strategy

Biochemical quantitative techniques, in C1, are partly assessed through unseen examinations in Stage 1. The whole of C1 together with C2, C3 and C5 are also assessed through coursework (laboratory reports, completion of quantitative and statistical calculation sheets, essays) during the first two years, which also tests C4 to some extent. C1-C5 form a major part of the assessment of the projects in Stages 3 and 4.

## Transferable/Key Skills

On completing the programme students should be able to:

D1 Communication technical information by means of clear written and spoken presentations following the acceptable conventions for scientific interchange.

D2 Use library and IT sources efficiently and critically

D3 Plan and prioritise work activities in order to meet deadlines

D4 Work independently with initiative, as well as synergistically in teams.

In addition, students opting to take modules covering employability skills at Stage 2, creativity and marketing at Stage 3 or ideas for business enterprise at Stage 4 have the opportunity to develop and demonstrate some or all of the following skills:

D5 The ability to submit effective application for employment

D6 Self-appraisal skills with regard to the development of workplace skills

D7 The ability to produce a Work Placement Plan to identify personal goals

D8 The ability to demonstrate personal achievement by reflecting on the development of graduate skills

For students on the Placement Year programme:

D9 Reflect on and manage own learning and development within the workplace

D10 Use existing and new knowledge to enhance personal performance in a workplace environment, evaluate the impact and communicate this process

D11 Use graduate skills in a professional manner in a workplace environment, evaluate the impact and communicate the personal development that has taken place.

## Teaching and Learning Methods

### *Teaching Strategy*

Management of workload in order to meet deadlines (D3) is promoted by means of a strict coursework timetable. All key skills (D1-4) are formally introduced in the Stage 1 study skills module. Team working skills (D4) are developed through supervised group exercises in the laboratory in Stage 2. Key skills D1-4 are further developed at Stages 3 and 4 through the projects. For those students taking modules focused on employability skills, lectures and tutorials help to develop D5-D8, and D6-D8 are further developed in the workplace under guidance from the Placement Tutor and the workplace supervisors. In optional modules focusing on creativity, marketing, and business enterprise, D6 and D8 are developed through group meetings. For those students taking a Placement year, preparation for the placement helps to develop D5 and D6-D11 are developed in the workplace with guidance from the Careers Service and the workplace supervisors.

### *Learning Strategy*

The learning of these skills by practice with feedback, together with formative and summative assessment, is embedded in the curriculum at all Stages and in the great majority of modules. There are also specific modules at each Stage that give explicit opportunities in this area. Students frequently submit reports based on their own laboratory work, conducted in teams or alone (D1, D4). Individual verbal presentations are assessed in the experimental design module and formative feedback is given (D1, D2). The application of D1, D3 and D4 are particularly practised in a Stage 2 module focussing on biotechnological methods, their principles, theory and practice. Talks are required in addition to the dissertation as outputs from the Biological Literature Review and other media are routinely used to produce outputs for the Biological Information Project. In Stage 4, several of the modules require the presentation of information in either a group or individual presentation. The optional modules on employability skills, creativity and marketing and business enterprise help students to develop their understanding of business processes within a scientific framework.

## Assessment Strategy

D1 and D2 are assessed repeatedly by means of coursework (including laboratory reports) at all Stages. The ability to critically assess and review existing information is specifically tested in the Stage 1 study skills module and the projects at Stages 3 and 4. Skills D5 to D11 are tested through work placement plans and reflective reports.

## 12 Programme Curriculum, Structure and Features

### Basic structure of the programme

The following principles have been followed within this degree programme with respect to its overall structure:

- **Stage 1** modules are broad in scope and complementary in subject area. They are chosen so that all Stage 1 students receive the same solid grounding in all fundamental areas underpinning biology, regardless of entry qualifications. Study and reading patterns are quite strongly directed but students can choose optional modules to a value of 20 credits.
- **Stage 2** modules are more specialised, relating more closely to the specifics of the subject. As such, they are shared with fewer other degree programmes. In general, study is more self-driven than at Stage 1, and students are encouraged to develop a more individual and original approach to reading and report writing. Some modules are based around techniques, so that at the end of Stage 2, students should be competent to carry out basic cellular, biochemical and molecular biological analyses. Students will also have had some experience of critically reviewing research literature, experimental design and data analysis, and the presentation of written and spoken reports resulting from their own work.
- **Stage 3** modules are yet more specialised and research informed. Much time is taken up with individual research work in the laboratory or library. Students are expected to apply the techniques and knowledge they have learnt in earlier Stages to specific tasks. Work should be highly self-directed, and revolve around the study of recent research-based literature. High quality work at this level should combine all the knowledge and skills objectives listed in the preceding sections.

- **Stage 4** consists of a 60 credit research project and a choice of specialised masters level modules (60 credits). The level of work at this stage is expected to reflect the higher level of qualification.

Students on the Placement Year programme will be on placement year between Stages 3 and 4 of their programme.

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

This degree programme allows students to undertake an academically study of biology that, as well as giving a sound background in general biology, focuses on the functioning of organisms from the sub-cellular to the whole-organism level. This aspect of biology provides the core of compulsory modules on the programme, with the option to select complementary modules on subjects such as business and pollution. In addition to providing a broad base of fundamental knowledge on cellular and molecular biology, the programme emphasises the practical application of this knowledge in areas such as genetic modification of microbes, animals and plants. There is a high content of laboratory practical work, including a week-long laboratory workshop that gives students direct practical experience of key standard molecular biological techniques. During the course of the degree programme, students also develop skills in the critical analysis and communication of scientific information. The fourth year provides the opportunity to undertake a substantial research project, working closely with a research group in the School.

#### **Programme regulations (link to on-line version)**

[C7C1 Biology \(Cellular and Molecular Biology\)](#)

[1141U Biology \(Cellular and Molecular Biology\) with Placement Year](#)

#### **13 Support for Student Learning**

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

[https://www.ncl.ac.uk/ltds/assets/documents/qsh\\_progspec\\_generic\\_info.pdf](https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf)

#### **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.

[https://www.ncl.ac.uk/ltds/assets/documents/qsh\\_progspec\\_generic\\_info.pdf](https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf)

##### *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 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.

#### **15 Regulation of assessment**

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

[https://www.ncl.ac.uk/ltds/assets/documents/qsh\\_progspec\\_generic\\_info.pdf](https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf)

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

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

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.