

PROGRAMME SPECIFICATION



1	Awarding Institution	Newcastle University
2	Teaching Institution	Newcastle University
3	Final Award	BSc (Hons)
4	Programme Title	Biology (Cellular and Molecular) and Biology (Cellular and Molecular with Placement).
5	UCAS/Programme Code	C1C7
6	Programme Accreditation	Not applicable
7	QAA Subject Benchmark(s)	Biosciences
8	FHEQ Level	Level 6
9	Date written/revised	May 2011

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 enhanced by an active research environment that engenders critical thinking.
- 5 Stimulate a wide interest in biological topics 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 context, utilise IT and library resources efficiently, process and interpret quantitative data, manage time effectively, and work 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 curriculum which meets the criteria for BSc. Honours Degree level in the Framework for Higher Education Qualifications issued by the Quality Assurance Agency.

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

Knowledge and Understanding

On completing the programme students should have:

- A1 A knowledge of biology from the molecular to the organism level.
- A2 An understanding of the functioning of plants, animals and micro-organisms, with particular reference to the cellular, biochemical, molecular genetic 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 advances in biological science on contemporary society and the future.

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 Stage 3 are crucial in delivering A5 as they provide knowledge and insights at the 'cutting edge'. A specialised module (BIO3015 Social Impact of Biology) addresses 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).

Assessment Strategy*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 3 assessment.

The level of academic achievement required under these strategic objectives is consistent with the award of a B.Sc. Honours Degree according to the FHEQ guidelines.

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

Scientific (cognitive, numerical and analytical) skills (B1, B2) are introduced at Stage 1, and more specifically, in BIO1010 Biology in Action. These skills are further developed at Stage 2 in BIO2020 Experimental Design and Statistics for Biologists and reinforced at Stage 2 via practical classes and the associated preparation of laboratory reports. B3 is also specifically addressed in BIO1010 Biology in Action and BIO2020 Experimental Design and Statistics for Biologists. During Stage 3, B1-3 are all practised in BIO3021 Laboratory Workshop and BIO3196 Research Project, whilst BIO3194 Biological Review Project and BIO3195 Biological Information Project are focused specifically on B3.

Learning Strategy

Students are encouraged to acquire B1-2 skills early via BIO1010 Biology in Action. They then have to rehearse these skills repeatedly in preparing a variety of laboratory and field practical reports at Stage 2. At Stage 2 BIO2020 Experimental Design and Statistics for Biologists offers repeated opportunities for practice of B3. B1-3 are all rehearsed again in full via the BIO3021 Laboratory Workshop. Stage 3 BIO3196 Research Project requires students to design their own experiments (B1), analyse data yielded (B2), and appraising the quality of the data collected (B3). BIO3194 Biological Review Project and BIO3195 Biological Information Project focuses on B3.

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 (BIO3194 Biological Review, BIO3195 Biological Information and BIO3196 Research projects).

The level of academic achievement required under these strategic objectives is consistent with the award of a B.Sc. Honours Degree according to the FHEQ guidelines.

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 BIO1010 Biology In Action module. Practical classes associated with many modules during the first two years and also wholly practical-based modules in stages 2 and 3 (BIO2005 Practical Biochemistry; BIO3021 Laboratory Workshop) progressively develop C1, C2 and C3 which is greatly enhanced by the individual research project in the final year (BIO3194, BIO3195 and BIO3196). The research project also makes a major contribution to C3, C4 and C5, as too does the specific Stage 2 module BIO2020 Experimental Design and Statistics for Biologists. 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 the final year C5 and the literature searching skills of C3 are thoroughly integrated into all submitted work.

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 final year research project. 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 and in the BIO3021 Laboratory Workshop in stage 3, which to some extent also tests C4. C1-to-C5 form a major part of the assessment of the final year research project.

The level of academic achievement required under these strategic objectives is consistent with the award of a B.Sc. Honours Degree according to the FHEQ guidelines.

Transferable/Key Skills

On completing the programme students should be able to:

- D1 Communicate 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, and also synergistically in teams.

In addition, students opting for the Placement year have the opportunity, as part of their placement experience, to develop and demonstrate:

- D5 The ability to submit effective applications for employment
- D6 Self-appraisal skills with regard to the development of workplace skills
- D7 The ability to produce a development plan to help overcome identified skills weaknesses
- D8 The ability to demonstrate personal achievement by preparation of a suitable portfolio of evidence

Teaching and Learning Methods

Teaching Strategy

Management of workload in order to meet deadlines (D3) is promoted by means of a strict coursework timetable (students are encouraged to complete their own Gantt charts which are included in the Degree Programme Handbooks). All key skills (D1-4) are formally introduced in BIO1010 Biology in Action. Team working skills (D4) are developed through supervised group exercises in the laboratory in Stage 2, and later via the BIO3021 Laboratory Workshop. For those students taking a Placement year, tutorials with the Placement Tutor help to develop D5 and D6-D8 are developed in the workplace under guidance from the Placement Tutor 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 BIO2020 Experimental Design and Statistics for Biologists and formative feedback is given (D1, D2). The application of all these skills is practised at Stage 3 in the BIO3021 Laboratory Workshop. Talks are required in addition to the dissertation as outputs from BIO3194 Review Project, and other media are routinely used to produce outputs for BIO3195 Biological Information Project.

Assessment Strategy

D1 and D2 are assessed repeatedly by means of coursework (laboratory reports) at all 3 Stages. The ability to critically assess and review existing information is specifically tested in BIO1010

Biology in Action and in the Stage 3 project modules (BIO3195/6).

The level of academic achievement required under these strategic objectives is consistent with the award of a B.Sc. Honours Degree according to the FHEQ guidelines.

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 non-overlapping 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 (20 credits) from a selection of three, in addition to the nine compulsory modules (100 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. The curriculum consists of ten compulsory modules (100 credits) and three optional ones (20 credits selected from 30). The placement year option occurs between Stages 2 and 3. The year allows students to experience first-hand the application of biology in industrial situations. It enhances the understanding of concepts and processes covered theoretically in Stages 1 and 2 and puts much of their previous knowledge into context.
- 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. The curriculum consists of eight compulsory modules (100 credits) and four optional ones (20 credits selected from 40).

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

The cellular and molecular strand, as well as giving a sound background in general biology, focuses on the molecular and physiological basis of biology from the sub-cellular to the whole-organism level. These provide the core of compulsory modules on the programme, with the option to select complementary modules on business, pollution, and human nutrition. In addition to providing a broad base of knowledge on cellular and molecular biology, the practical application of this knowledge is emphasised in areas such as genetic modification of microbes, animals and plants, and bioremediation. 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. As a whole, the degree programme allows students to undertake an academically coherent study of biology with a focus topics centred on cellular and molecular function. The option to undertake a Placement Year in industry is unique to this stand of our Biology degree programmes and provides students with real workplace experience and the opportunity to reflect on career development.

Programme regulations (link to on-line version)

Go to <http://www.ncl.ac.uk/regulations/docs/> and follow links for 2011/12 Degree Programme Regulations, SAGE Faculty, School of Biology, Biology (Cellular and Molecular) C1C7

13 Criteria for admission

Entrance Requirements

Go to <http://www.ncl.ac.uk/undergraduate/course/C100/entrance-requirements>

14 Support for Student Learning

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.

Help with academic writing is available from the Writing Centre.

Academic support

The initial point of contact for a student is with a lecturer or module leader, or their tutor (see below) for more generic issues. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Staff-Student Committee, and/or at the Board of Studies.

Pastoral support

All students are assigned a personal tutor whose responsibility is to monitor the academic performance and overall well-being of their tutees. In addition the University offers a range of support services, including one-to-one counselling and guidance or group sessions/workshops on a range of topics, such as emotional issues eg. 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 Union Society 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 Service 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-session 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 review and innovations

Changes to existing modules and the introduction of new ones are considered at the School Teaching and Learning Committee and at the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Teaching and Learning Committee.

Programme reviews

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Teaching and Learning Committee.

External Examiner reports

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

Student evaluations

All modules, and the degree programme, are subject to review by student questionnaires. Informal student evaluation is also obtained at the Staff-Student 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 the students' views on the quality of the learning and teaching in their HEIs. With reference to the outcomes of the NSS and institutional student satisfaction surveys actions are taken at all appropriate levels by the institution.

Mechanisms for gaining student feedback

Feedback is channelled via the Staff-Student Committee and the Board of Studies.

Faculty and University Review Mechanisms

The programme is subject to the University's Internal Subject Review process. Every five years degree programmes in each subject area are subject to periodic review. This involves both the detailed consideration of a range of documentation, and a two-day review visit by a review team which includes an external subject specialist in addition to University and Faculty representatives. Following the review a report is produced, which forms the basis for a decision by University Teaching and Learning Committee on whether the programmes reviewed should be re-approved for a further five year period.

16 Regulation of assessment

Pass mark

The pass mark is 40 (Undergraduate programmes)

Course requirements

Progression is subject to the University's Undergraduate Progress Regulations and Undergraduate Examination Conventions. 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 each Stage and there are resit opportunities, with certain restrictions.

Weighting of stages

The marks from Stages 2 & 3 will contribute to the final classification of the degree

The weighting of marks contributing to the degree for Stages 2 & 3 is 25:75

Common Marking Scheme

The University employs a common marking scheme, which is specified in the Undergraduate

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

	Modules used for degree classification (DC)	Modules not used for degree classification
<40	Fail	Failing
40-49	Third Class	Basic
50-59	Second Class, Second Division	Good
60-69	Second Class, First Division	Very Good
70+	First Class	Excellent

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

Role of the External Examiner

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

- See and approve examination papers
- Moderate examination and coursework marking
- Attend the Board of Examiners
- Report to the University on the standards and delivery of the programme

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

The University Prospectus (see <http://www.ncl.ac.uk/undergraduate/>)

The School Brochure (contact Biology.TSO@ncl.ac.uk)

The University Regulations (see <http://www.ncl.ac.uk/calendar/university.regs/>)

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.

**Programme Specification Annex for C1C7 Biology (Cellular and Molecular) and Biology
(Cellular and Molecular with Placement) (2011/12)**

Mapping of Intended Learning Outcomes onto Curriculum/Modules

Curriculum Structure

Achievement of specific Intended Learning Outcomes (A-D) occurs through provision in the **compulsory** and *optional* modules specified for each Stage in the Degree Programme Regulations, as follows:

Code	Type	A	B	C	D
Stage 1					
BIO1013	Compulsory	1,2	2,3		1
BIO1001	Compulsory	1,2	2	3	1,2,3
BIO1002	Compulsory	1,3			1,2
BIO1003	Compulsory	1-5	2		1,2,3,4
BIO1004	Compulsory	1-5	2	1,2,5	1,2,3,4
BIO1005	Compulsory	1,3	1,3		1,2
BIO1006	Compulsory	1,5	1,2	2	1,3,4
BIO1010	Compulsory	1	2	1-5	1,2,3,4
BIO1019	Compulsory	1,2	1,2	1-5	1,3,4
BIO1007	Optional	1-5		1-3,5	
PSY1006	Optional	1,2	1		1
ACE1022	Optional	1,4	2		1,3,4
Stage 2					
BIO2004	Compulsory	1-5	1,2	1-4	1-4
BIO2005	Compulsory	1,2,4	2	1-5	1-4
BIO2010	Compulsory	1,2,4	2	1,2	1,2
BIO2014	Compulsory	1,2	2	2	1-4
BIO2015	Compulsory	1,2,4,5	2	1-3	1,3,4
BIO2016	Compulsory	1,2	2	3	1,2
BIO2017	Compulsory	1,2,4	2	2,3	1-4
BIO2019	Compulsory	1,2	2	2,3	1,3,4
BIO2020	Compulsory	1	1,2	1,2	1-4
ACE2034	Compulsory	1,2	1,2	1,2	1-2
BIO2018	Optional	1,2,4,5	2,3	3-5	1-4
ACE2031	Optional	1,2	1,2	1,3	1-4
ACE2036	Optional	1,2	1,2	2	1-4
Placement Year					
					5-8
Stage 3					
BIO3004	Compulsory	1,2,4,5	3	3,4	1-4
BIO3015	Compulsory	1,5	3	4	1
BIO3018	Compulsory	1,2,4	3	3-5	1-4
BIO3019	Compulsory	1,2,4,5	2,3	3-5	1,2
BIO3020	Compulsory	1,2,4	3	3-5	1-4
BIO3021	Compulsory	1,2,4	1,2,3	1-4	1-4
BIO3032	Compulsory	1,2,4	2,3	3-5	1-4
BIO3194	Compulsory**	1,2	2,3	3-5	1-4
BIO3195	Compulsory**	1,2	2,3	3-5	1-4
BIO3196	Compulsory**	1,2,5	1-3	1-5	1-4
BIO3030	Optional	1-5	3	1-5	1-4
BIO3031	Optional	1,2,4,5	3	3-5	1-4
ACE3052	Optional	1,2,4,5	3	3-5	1-4
BMS3003	Optional	4,5	3		1-4

Notes: ** Students must select one from BIO3094, BIO3095 or BIO3096