

PROGRAMME SPECIFICATION

This document describes the **Honours Degree programme in Biology**. This specification is valid for new entrants from **September 2018**.

The aims of the Honours Degree programme in Biology are to:

- provide a sound knowledge and understanding of the organismal and molecular principles of the subject through a core set of course units, and develop an insight into the current frontiers of knowledge, primarily through a series of specialised Stage 3 course units;
- develop, through a flexible and progressive structure, a range of subject-specific and transferable skills, including practical laboratory skills, fieldwork skills, self-management, information retrieval, communication and presentation skills, working with others, decision making and meeting deadlines, that equip students for future employment;
- provide experience of independent research through a final year project;
- produce graduates who can work safely and responsibly with biological materials, laboratory equipment and in the field.

The programme is delivered in three stages, each of which comprises one year of full-time study, or two years of part-time study, during which the student must follow course units to the value of 120 national credits. The curriculum offers a diverse range of courses and flexibility. It is based around a core of mandatory course units running across all three years, providing essential training in systematic and quantitative techniques and offering a combination of animal and plant-based course units, together with an individual research project in Stage three. The degree offers significant flexibility, to tailor the programme towards individual interests in animals or plants, organismal or molecular studies, or to retain the broad-based approach.

Stage one comprises 3 mandatory course units (45 credits) that seek to provide grounding for the study of biological sciences at degree level, and a foundation in the core areas of Cell Biology and Genetics. Optional courses (totalling 75 credits) can be selected from a range that includes Biomes and Ecosystems, Vertebrate Evolution and Diversity, Biology in a Changing World, Physiology, Chemistry, Biochemistry, and Green World: Plant Evolution, Form and Function. Stage one also includes a strong element of laboratory and field training, with practical work in all course units, as well as providing support with the skills necessary for the study of biological sciences. In **Stage two**, students take 3 mandatory course units to the value of 45 credits building on foundations laid in the first year and choose 5 course units (75 credits) from the extensive range of 15-credit options available. Options range from organismal subjects such as Invertebrate Biology and Animal Behaviour, to molecular subjects such as Neuronal and Cellular Signalling and Plant Biochemistry and Biosynthesis. Other options include two intensive field-based course units, with Practical Field Ecology conducted locally, and Marine Biology offered as a residential field course in Scotland. The course units taken in Stage 2 provide a basis for research-led specialist options in stage three. **Stage three** requires students to take 2 mandatory course units to the value of 45 credits and choose the remaining 5 course units (75 credits) from a list of diverse 15-credit options. These include courses as diverse as Extreme Animal Physiology, Marine Ecology and Biodiversity, Medical Biochemistry and Seed Biology. An overseas field course is also offered. Most of the Stage 3 course units closely reflect the research interests of members of staff who are all specialists in their fields. Students complete an individual research project, which provides training in a specialised research area and also in generic skills such as independent working, literature searching, report writing, use of word processing, graphics and statistics.

The programme provides coverage across a range of modern animal and plant, organismal and molecular topics, and involves training in a variety of practical techniques and skills relevant to research in the biological sciences. The system is also flexible and allows the students to transfer to other degree streams within the School up to the start of the second term, or indeed (depending on the options chosen) up to the start of the second year. Students

can also take up to 30 credits outside of the School of Biological Sciences, but within the Faculty of Science during stage two or three. Options are selected in consultation with the student's Personal Tutor and the Director of Teaching.

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This document provides a summary of the main features of the programme(s), and of the outcomes which a student might reasonably be expected to achieve if full advantage is taken of the learning opportunities provided. Further information is contained in the College prospectus, the College Regulations and in various handbooks issued to students upon arrival. Whilst Royal Holloway keeps all its information for prospective applicants and students under review, programmes and the availability of individual course units are necessarily subject to change at any time, and prospective applicants are therefore advised to seek confirmation of any factors which might affect their decision to follow a specific programme. In turn, Royal Holloway will inform applicants and students as soon as is practicable of any substantial changes which might affect their studies.

Learning outcomes

Teaching and learning in the programme are closely informed by current developments (including practical aspects) in the subject and by the active research of staff, particularly in the areas of animal behaviour, biodiversity, conservation, ecology and the environment, evolution, marine biology, physiology, plant and animal cell biology, molecular biology, cell signalling, microbiology, parasitology, plant biotechnology, immunology, developmental biology and gene therapy. In general terms the programme provides a variety of opportunities for students to develop and demonstrate these learning outcomes:

Knowledge and understanding

- an understanding of the ecological, evolutionary, cellular, molecular, biochemical and physiological principles that underlie life processes;
- a critical understanding of the diversity and complexity of life and life processes;
- a familiarity with terminology, nomenclature and classification systems;
- a critical understanding of ecological systems and of the interrelationships between organisms and the environment they live in;
- a critical understanding of genetics and of the evolutionary processes that give rise to the diversity and complexity of life;
- a knowledge and critical understanding of the appropriate experimental methods (both laboratory and fieldwork based) and strategies for the investigation of relevant areas of biology;
- understanding cutting-edge developments in a range of areas specific to the subject;
- knowledge and engagement with philosophical and ethical issues arising from some of the current developments in the biosciences;
- knowledge of the variety of sources of bioscience information and strategies for accessing these.

Skills and other attributes

- a range of laboratory and fieldwork techniques of key importance in biology;
- working safely in a scientific laboratory and in the field, with awareness of standard safety protocols;
- the ability to apply relevant numerical skills, including statistics, to biological data;
- the ability to employ and evaluate suitable experimental methods (both laboratory and fieldwork based) for the investigation of relevant areas of biology;

- the ability to access information from a variety of sources in order to maintain and enhance knowledge of the Biosciences and to communicate the principles clearly in oral and written forms;
- assessing the merits of contrasting subject-specific theories, paradigms, concepts and principles;
- applying subject-specific knowledge and understanding to address familiar and unfamiliar problems;
- the ability to plan, design and execute an independent piece of research through a theoretical or practical project in biology, including the production of the final report;
- taking personal responsibility for learning, and developing habits of reflection on that learning;*
- identifying, retrieving (including the use of online computer searches), sorting and exchanging information;*
- abstracting and synthesising information, and developing a reasoned argument;*
- critically interpreting and evaluating experimental data and relevant literature, analysing and solving problems, and decision-making;*
- written communication and verbal presentation;*
- information technology (including spreadsheets, databases, word processing, email and WWW);*
- interpersonal skills, including working in groups/teams and recognising and respecting the viewpoints of others;*
- CV and career preparation.*

* transferable skills

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Teaching, learning and assessment

The overall strategy is to provide a progressive approach to biological concepts and systems of increasing complexity through teaching methods that aid learning and stimulate interest. Teaching is mostly by means of lectures, laboratory and fieldwork classes, seminars, tutorials, study/revision sessions, with knowledge and understanding further developed by guided independent study. Learning and analytical ability are developed and reinforced through problem solving, essay writing, practical classes (both laboratory and fieldwork), critical evaluation and by giving students the opportunity to design, execute and evaluate their own experiments.

Students are encouraged to acquire further knowledge beyond taught material, e.g. by reading topical reviews, original research literature and attending research seminars, especially in the final year. The practical assignments associated with first year and second year course units provide training in a range of subject specific laboratory techniques, including safety assessment. The culmination of these skills is demonstrated in the final year research project, and for literature skills the preparation of a literature report.

Training in intellectual and key transferable skills is embodied throughout the programme and forms a strong element of the tutorial and study session programmes. All students are required to meet basic standards in information technology.

Assessment of knowledge and understanding is typically by formal unseen written examinations, practical exams, and a range of coursework including practical assignments (both laboratory and fieldwork based), poster preparation, oral presentations, essays and the individual research project. Full details of the assessments for individual course units can be obtained from the [School](#).

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Details of the programme structure(s)

Please note that the list of available course units offered is subject to change and not all course units run each year. A full list of course units for the current academic year can be obtained from the [School](#).

Stage one:

Full-time students must take the following mandatory course units:

- BS1021 Becoming a Bioscientist (15 credits; condonable)
- BS1071 Cell Biology and Evolution (15 credits; condonable)
- BS1072 Genetics (15 credits; condonable)

And choose five optional course units (75 credits) from the following Stage one course units:

- BS1031 Chemistry of Life (15 credits)
- BS1032 Fundamental Biochemistry (15 credits)
- BS1041 Biology in a Changing World (15 credits)
- BS1042 Vertebrate Evolution and Diversity (15 credits)
- BS1043 Green World: Plant Evolution, Form and Function (15 credits)
- BS1051 Ecology and Conservation (15 credits)
- BS1052 Biomes and Ecosystems (15 credits)
- BS1061 Introductory Animal Physiology (15 credits)
- BS1062 Pathophysiology (15 credits)
- BS1091 Protein Biochemistry and Enzymology (15 credits)

Part-time students must take:

Stage one (a):

- BS1021 Becoming a Bioscientist (15 credits; condonable)
- BS1071 Cell Biology and Evolution (15 credits; condonable)
- BS1072 Genetics (15 credits; condonable)

and choose options to the value of 15 credits from the Stage one course units listed above.

Stage one (b):

Options to the value of 60 credits from the Stage one course units listed above

Stage two:

Full-time students must take the following mandatory course units:

- BS2020 Plant Life: From Genes to Environment (15 credits; condonable)
- BS2120 Biological Data Analysis and Interpretation (15 credits; condonable)
- BS2160 Evolution (15 credits; condonable)

and choose five optional course units (75 credits) from the following Stage two course units:

- BS2001X Marine Biology (15 credits)
- BS2005 Microbiology (15 credits)
- BS2010 Invertebrate Biology: Structure, Behaviour and Evolution (15 credits)
- BS2040 Cell Dynamics: Division and Movement (15 credits)
- BS2050 Human Physiology in Health and Disease (15 credits)
- BS2060 Developmental Biology (15 credits)
- BS2090 Insects, Plants and Fungi: Ecology and Applications (15 credits)
- BS2110 Practical Field Ecology (15 credits)
- BS2140 Animal Behaviour (15 credits)
- BS2150 Applications of Molecular Genetics in Biology (15 credits)
- BS2510 Bioenergetics and Metabolism (15 credits)
- BS2520 Protein Structure and Function (15 credits)
- BS2530 Molecular Biology (15 credits)
- BS2540 Molecular and Cellular Immunology (15 credits)
- BS2550 Neuronal and Cellular Signalling (15 credits)
- BS2580 Plant Biochemistry and Biosynthesis (15 credits)

Part time students must take:

Stage two (a):

BS2020 Plant Life: From Genes to Environment (15 credits; condonable)

BS2120 Biological Data Analysis and Interpretation (15 credits; condonable)

BS2160 Evolution (15 credits; condonable)

and choose options equal to the value 15 credits from the stage two course units listed above.

Stage two (b):

Options equal to the value of 60 credits from the Stage two course units listed above

Stage three:

Full-time students must take the following mandatory course units:

BS3010 Individual Research Project (30 credits) (Non-condonable fail – must be passed in order to qualify for the field of study).

BS3190 Climate Change: Plants and the Environment (15 credits; condonable)

and choose five options (75 credits) from the following Stage three course units:

BS3020 Special Study: Dissertation (15 credits)

BS3030 Biology of Parasitic Diseases (15 credits)

BS3060 Conservation Biology (15 credits)

BS3090 Entomology: Pure and Applied (15 credits)

BS3110 Mediterranean Conservation and Ecology Field Course (15 credits)

BS3120 Population and Community Ecology (15 credits)

BS3160 Behavioural Ecology (15 credits)

BS3180 Marine Ecology and Biodiversity (15 credits)

BS3210 Evolutionary Ecology of Vertebrates (15 credits)

BS3220 Extreme Animal Physiology (15 credits)

BS3230 Circadian Biology (15 credits)

BS3410 Industrial Biotechnology in a Changing World (15 credits)

BS3420 Medical Biochemistry (15 credits)

BS3510 Molecular and Medical Microbiology (15 credits)

BS3520 Seed Biology: From Molecular & Conservation Biology to Industrial Applications (15 credits)

BS3530 Applications of Advanced Molecular Biology Methods (15 credits)

BS3540 Cell and Molecular Biology of Cancer (15 credits)

BS3560 Functional Genomics, Proteomics, and Bioinformatics (15 credits)

BS3570 Human Embryology and Endocrinology (15 credits)

BS3580 Cell and Molecular Neuroscience (15 credits)

BS3590 Molecular Basis of Inherited Disease (15 credits)

Part time students must take:

Stage three (a):

BS3010 Individual Research Project (30 credits) (Non-condonable fail – must be passed in order to qualify for the field of study)

BS3190 Climate Change: Plants and the Environment (15 credits; condonable)

and choose options equal to the value of 15 credits from the Stage three course units listed above.

Stage three (b):

Options equal to the value of 60 credits from the Stage three course units listed above.

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Progression and award requirements

Students are considered for the award and classified on the basis of a weighted average. This is calculated from marks gained in course units taken in stages two and three, and gives twice the weighting to marks gained in stage three. The College's [Undergraduate Regulations](#) include full details on progression and award requirements for all undergraduate programmes offered by the College.

In order to qualify for the award of Biology degree, students must gain a weighted average of at least 35%, pass at least 90 credits in the final year and take the mandatory course units specified above. The Individual Research Project (BS3010) is mandatory, non-condonable. Students must pass this module in order to qualify for an Honours Degree in Biology.

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Student support and guidance

- Personal Tutors: All students are allocated a Personal Tutor who meets with them regularly through the programme. The Personal Tutor's role is to advise on academic, pastoral and welfare issues, but with referral of students for professional help, e.g. counselling, if required. Students work closely with their Personal Tutor in tutorial groups of around 6 students, primarily throughout the teaching terms.
- The Director of Teaching and Academic Coordinators provide a back-up system of academic, pastoral and welfare advice.
- Provision of study skills sessions throughout the academic year focuses on enhancing generic study skills. The aim is to facilitate the transition of students to the University learning environment allowing them to perform to the best of their academic ability. Excellent associated online resources are also available through Moodle, the virtual learning environment, and on the Royal Holloway website.
- All staff are available and accessible through an open-door policy or by operating a defined office hours system, or by appointment.
- Student representation is included on the Staff-Student Committee and the School Teaching Committee. .
- Detailed student handbook and module resources are provided.
- Extensive supporting materials and learning resources are available in the College libraries, the Computer Centre and via the School website and Moodle.
- Dedicated teaching laboratories are housed in the School of Biological Sciences (Bourne) Building.
- The School of Biological Sciences has a Dyslexia and Disability Service (DDS) network member.
- College Careers and Employability Service and School Careers Liaison Officer, supplemented by a dedicated careers area.
- Access to all College and University support services, including Student Counselling Service, Health Centre and the Disability and Dyslexia Service for students with disabilities and Specific Learning Difficulties.

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Admission requirements

Details of the Department's typical offer for each programme of study is available on the [Course Finder](#) web page. However, the Department also has flexibility in its admissions and offers policy and strongly encourages applications from non-standard applicants. Students whose first language is not English may also be asked for a qualification in English Language at an appropriate level. For further guidance it may also be helpful to contact the [Recruitment and Partnership Office](#).

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Further learning and career opportunities

Graduates from Biological Sciences degree programmes have successfully progressed into a wide range of professions, while many have continued onto Postgraduate studies. For further details please refer to the [Careers Service](#).

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Indicators of quality and standards

Royal Holloway's position as one of the UK's leading research-intensive institutions was confirmed by the results of the most recent Research Excellence Framework (REF 2014) conducted by the Higher Education Funding Council (HEFCE). The scoring system for the REF 2014 measures research quality in four categories, with the top score of 4* indicating quality that is world-leading and of the highest standards in terms of originality, significance and rigour and 3* indicating research that is internationally excellent. 81% of the College's research profile was deemed to be within the 4* or 3* categories, an increase of over 20% since 2008. This result placed Royal Holloway 31st overall in the UK for 4* and 3* research and 33rd based on an overall Grade Point Average (GPA) score.

The School of Biological Sciences is ranked 34th in the UK for research of 4* standard and 32nd for 3* and 4* research.

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List of programmes offered by the School of Biological Sciences

Programmes are taught almost entirely by staff at Royal Holloway University of London, with some third year course units including contributions from external lecturers who are experts in their subject area. All programmes lead to awards of the University of London. The QAA subject benchmark statement in Biosciences describes the general features which one might expect from Honours Degree programmes in the subject, and can therefore be used as a point of reference when reading this document (see www.qaa.ac.uk). UCAS codes are given in parentheses (see www.ucas.ac.uk).

Single Honours Degree programmes in Biological Sciences taught wholly within the School of Biological Sciences

BSc Biology (C100)

Available Full Time or Part Time

Accreditation

The Honours Degree programme in Biology is accredited by the Royal Society of Biology.

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