

---

# Programme Specification

---

## **BSc Biological Sciences**

Awarding Institution:  
Teaching Institution:  
Relevant QAA subject benchmarking group(s):  
Faculty of Life Sciences  
For students entering Part 3 in:  
Date of specification:  
Programme Director:  
Programme Adviser:  
Board of Studies:  
Accreditation:

## **UCAS code: C100**

University of Reading  
University of Reading  
Biosciences  
Programme length: 3 years  
October 2009  
April 2009  
Dr Gail Hutchinson  
Professor Phil Knight  
Biological Sciences  
None

### **Summary of programme aims**

The Biological Science degree programme aims to provide students with the opportunity to study biology at scales ranging from biomolecular processes to global ecological systems. It aims to allow students to choose either to specialise on a particular stream or to choose a broad-based programme, taking modules from a variety of streams.

Students are expected to gain a broad understanding of the concepts underpinning biological sciences and to demonstrate the ability to complete a detailed study during Part 3.

The programme is concerned especially with the diversity of living organisms and includes study of the biology of all types of organisms, from microorganisms to flowering plants and mammals, at levels ranging from the molecular, biochemical and cellular to the physiological, environmental and ecological. The subject matter of Part 1 is broadly based but allows increasing specialisation in Parts 2 and 3 to provide a coherent, in-depth area of study that the student may select.

### **Transferable skills**

The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to enhance their skills relating to career management, communication (both written and oral), information handling, numeracy, problem solving, team working and use of information technology.

As part of this programme all students are also expected to have gained experience and show competence in the following transferable skills:

1. The ability to assess, evaluate and present scientific data.
2. The ability to design and undertake a programme of scientific investigation and to effectively communicate the aims and results of this investigation.
3. A range of laboratory-based practical skills and, in the Environmental stream, laboratory and field-based practical skills.

## Programme content

The profile that follows states which modules must be taken (the ‘compulsory’ modules), together with one or more lists of modules from which the student must make a selection (the ‘optional’ modules). Students choose additional modules as they wish, in consultation with their programme adviser, to make 120 credits in each Part. The number of module credits for each module is shown in brackets after its title. Students may take up to 70 credits in any one term.

### Part 1 (three terms, 120 credits)

<i>Compulsory core modules (50 credits) – All students</i>		<i>Credits</i>	<i>Level</i>
BI1BA1	The Living Cell	10	C
BI1BC2	Genes and Chromosomes	10	C
BI1EC12	Exploiters and Exploited	20	C
BI1EG2	Plant Diversity, Structure and Utilisation	10	C
<b>Also, students without AS or A2 level Chemistry or an equivalent qualification must take:</b>			
CH1FC1	Fundamental Chemistry 1	10	C
To achieve a total of 120 credits, students are asked to choose additional <b>modules from one of the two groups of modules listed below</b> . <i>Other module combinations may be possible subject to the approval of your programme adviser and to timetabling constraints.</i>			
<b>Biomolecular Group of Modules (60 or 70 credits)</b>			
<i>Compulsory (20 credits)</i>			
AM1P11	Introductory Microbiology	10	C
BI1BG3	Practical Biochemistry	10	C
<i>Optional (40 or 50 credits)</i>			
AP1A18	Digestion and Nutrition	10	C
BI1BB2	Biochemistry and Metabolism	10	C
BI1BE2	Pathology: Introduction to Human Disease	10	C
BI1EF2	Ecology: Species and their Interactions <sup>b</sup>	10	C
BI1EF23	Ecology: Species and their Interactions <sup>b</sup>	20	C
BI1EI1	Soil: Principles and Management	10	C
CH1FC2	Fundamental Chemistry 2	10	C
CH1IN2	Descriptive Inorganic Chemistry*	10	C
CH1OR2	Fundamentals of Organic Chemistry*	10	C
CH1PH2	Physical Processes for Biologists*	10	C
LA1XX	Institution-Wide Language Programme	20	C/I
PM1PB2	Human Physiology <sup>a</sup>	20	C
PM1PB2A	Human Physiology <sup>a</sup>	10	C
<b>Bio-environmental Group of Modules (60 or 70 credits)</b>			
<i>Compulsory (30 credits)</i>			
BI1EF23	Ecology: Species and their Interactions	20	C
BI1EI1	Soil: Principles and Management	10	C
<i>Optional (30 or 40 credits)</i>			
AM1P11	Introductory Microbiology	10	C
BI1EA1	Introduction to Enterprise and Marketing	10	C
BI1EB2	Humans and the Changing World	10	C
BI1ED2	Mammals: Diversity, Behaviour and Conservation	10	C
BI1EH1	Principles of Horticulture	10	C
LA1XX	Institution-Wide Language Programme	20	C/I

<sup>a</sup> you can choose either module, not both <sup>b</sup> you can choose either module, not both

\* requires A level Chemistry

## Part 2 (three terms, 120 credits)

<b>Compulsory modules (60 credits)</b>		<i>Credits</i>	<i>Level</i>
AS2A1	Statistics for Life Sciences	10	I
BI2BG5	Animal, Plant and Microbial Development	10	I
BI2BK5	Molecular Biology of Gene Expression	10	I
BI2BM5	Science Communication	10	I
BI2EE4	Evolutionary Biology	10	I
<b>Compulsory modules Biomolecular Option only</b>			
BI2BP6	Practical Skills: Recombinant DNA Exercise	10	I
<b>Compulsory modules Bio-environmental Option only</b>			
BI2EWEV	Biodiversity Field Course	10	I
<p><b>Optional modules (60 credits)</b> To achieve a total of 120 credits, students choose additional modules, subject to the agreement of the Programme Adviser. Students are encouraged to focus in on a particular area of study. Those wishing to follow the Biomolecular Option should choose <u>at least</u> 40* credits from modules from the <i>Biomolecular</i> strand. Students wishing to follow the Bio-environmental Option should choose <u>at least</u> 40* credits from modules from <i>Bio-environmental</i> strand. Remaining credits may include any of the range of Bioscience modules, plus modules from other areas of the University. Students may take a maximum of 70 credits (including compulsory modules) in any one term [* excluding Institution-Wide Language Programme]</p>			
<b>Biomolecular Modules</b>			
AS2H1	Genetic Data Analysis	10	I
BI2BB4	Endocrinology	10	I
BI2BC4	Human Development, Organogenesis and Anatomy	10	I
BI2BD4	Life and Death of a Cell	10	I
BI2BE4	Pharmacology and Toxicology	10	I
BI2BF4	Physiology and Genetics of the Bacterial Cell	10	I
BI2BI5	Immunology	10	I
BI2BJ5	Microbiology: a Medical Perspective	10	I
BI2BL5	Protein Structure and Function	10	I
BI2BO5	Virology	10	I
BI2EH4	Introduction to History and Philosophy of Science	10	I
LA1XX	Institution-Wide Language Programme	20	C/I
<b>Bio-environmental Modules</b>			
BI2BN5	Vertebrate Zoology	10	I
BI2EA4	Weed Biology and Control	10	I
BI2EB4	Arboriculture and Ornamental Crops	10	I
BI2ED4	Evolution and Classification of Plant Diversity	10	I
BI2EF6	Habitat Management	10	I
BI2EG5	Horticultural Crop Production	10	I
BI2EH4	Introduction to History and Philosophy of Science	10	I
BI2EI4	Invertebrate Zoology	10	I
BI2EM5	Landscapes for Amenity and Sport	10	I
BI2EN5	Animal Behaviour	10	I
BI2EO5	Applied Ecology	10	I
BI2EP5	Crop Pests and Integrated Crop Protection	10	I
BI2ET3P	Flora of the British Isles	10	I
LA1XX	Institution-Wide Language Programme	20	C/I

### Part 3

<b>Compulsory modules</b>		<b>Credits</b>	<b>Level</b>
BI3PRO	Research Project	40	H
<p><b>Optional modules: (80 credits):</b>            Students will choose additional modules up to a total of 120 credits, subject to timetabling constraints and the agreement of the Programme Adviser. Details can be found at <a href="http://www.info.rdg.ac.uk/Module/">www.info.rdg.ac.uk/Module/</a>. In this final year students will be encouraged to focus their studies by specialisation within either the <b>Biomolecular strand</b> (including Biochemistry, Microbiology, Biomedical Science) or <b>Bio-environmental strand</b> (including Ecology, Conservation, Environmental Biology, Zoology, Botany). No more than 70 credits should be taken in any one term.</p>			
<b>Biomolecular Options</b>			
BI3BA7	Medical Genetics	10	H
BI3BB7	Selected Topics in Endocrinology and Endocrine Disease	10	H
BI3BC7	Bacterial Pathogens	10	H
BI3BD8	Cancer	10	H
BI3BE8	Cardiovascular Disease	10	H
BI3BF7	Cell Communication and Disease	10	H
BI3BG8	Mechanisms for Microbial Function	10	H
BI3BH8	Mammalian Reproduction	10	H
BI3BI8	Neurobiology	10	H
BI3BJ8	Viral Pathogens	10	H
BI3BM7	Immunology of Bacterial, Viral and Parasitic Diseases	10	H
BI3BN8	Use and Abuse of the Microbial World	10	H
BI3SA1	Epidemiology	10	H
BI3SA2	Clinical Trials	10	H
FB3N2A	Diet and Disease	10	H
FB3N2B	Genes Lifestyle and Nutrition	10	H
<b>Bio-environmental Options</b>			
AP3A67	Animal Welfare	10	H
AP3A68	Wildlife in the Farming Environment	10	H
AP3A76	Principles and Practice in Biological Control	10	H
AP3A84	Dogs and Cats	10	H
BI3EA7	Environmental and Ecological Weed Management	10	H
BI3ED6P	Marine Biology Field Course <i>(Takes place during summer after Part 2 Examinations. Enrolment procedures and availability take place in Spring Term Part 2)</i>	10	H
BI3EE8	Biodiversity Assessment and the Sustainable Use of Plant Resources	10	H
BI3EF8	Biodiversity Informatics	10	H
BI3EG7	Evolutionary Genetics and Phylogeny	10	H
BI3EH8	Plant Biotechnology for Postharvest Quality	10	H
BI3EI8	Research Topics in Ecology	10	H
BI3EJ8	Conservation Biology	10	H
BI3EK7	Behavioural Ecology and Life History Theory	10	H
BI3EL7	Plants and Climate	10	H
BI3EO7	Physiological Ecology	10	H
BI3EV8	Biotechnology for Plant Breeding	10	H

### **Progression requirements**

To gain a threshold performance at Part 1 a student shall normally be required to achieve an overall average of 40% over 120 credits taken at Part 1 and a mark of at least 30% in individual modules amounting to not less than 100 credits. **In order to progress from Part 1 to Part 2** a student shall normally be required to achieve a threshold performance at Part 1.

To gain a threshold performance at Part 2 a student shall normally be required to achieve an overall average of 40% over 120 credits taken at Part 2 and a mark of at least 30% in individual modules amounting to not less than 100 credits. **In order to progress from Part 2 to Part 3** a student shall normally be required to achieve a threshold performance at Part 2.

### **Summary of teaching and assessment**

Teaching is organised in modules. Teaching in Part 1 consists of lectures and practical classes with small group work being largely restricted to the Experiments: Design and Interpretation module. Modules can be assessed by 100% coursework but more usually are assessed by a combination of coursework (30%) and formal examination (70%).

In Parts 2 and 3, lectures and practical classes continue to be major modes of teaching but they are increasingly supplemented by seminars and other group work. Modules can be 100% in-course assessed but are more usually assessed by a combination of coursework (30%) and formal examination (70%).

Part 2 contributes one third of the overall assessment and Part 3 the remaining two thirds. In order to be eligible for Honours, students must gain an overall weighted average mark of 40% and must gain a mark of at least 40% in the Research Project module.

The assessment is carried out within the University's degree classification scheme, details of which are in the programme handbooks.

### **Admission requirements**

Entrants to this programme are normally required to have obtained:

**UCAS Tariff:** 300 points from no more than 4 subjects at A level, including grade B in A level Biology and one other Science A level at grade C. Total points exclude Key Skills and General Studies. **GCSEs:** grade C required in Mathematics, English and Science.

**International Baccalaureate:** Pass Diploma and achieve 6,6,5 in 3 higher level subjects, including Biology and another Science.

Applicants with other types of qualifications and mature students are also encouraged to apply.

**Admissions Tutor:** Dr Ross Cameron

### **Support for students and their learning**

University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers and the University Library, which across its three sites holds over a million volumes, subscribes to around 4,000 current periodicals, has a range of electronic sources of information and houses the Student Access to Independent Learning (S@IL) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, School Senior Tutor, the Careers

Advisory Service, the University's Special Needs Advisor, Study Advisors, Hall Wardens and the Students' Union.

In addition to the above, the School of Biological Sciences has several well-equipped teaching laboratories and a dedicated computer laboratory providing students with in-house access to on-line educational material. The School of Biological Sciences also houses an extensive zoological museum and collection, a herbarium and botanic garden. These provide a rich source of material and specimens that are incorporated into several modules.

### **Industrial Placement**

Students who are interested in a scientific career, whether in industry, research or some other related field can apply for a year's placement between Parts 2 and 3. Students who wish to apply would normally be expected to have a weighted average of at least 60% in Part 1.

### **Career prospects**

Reading Biological Science graduates are eligible for membership of the Institute of Biology and can achieve Chartered Biologist status. They are qualified to enter a variety of careers in the biological sciences, including work in industry (pharmaceuticals, biomedical, agrochemicals), government service (research institutes and bodies such as the Environment Agency) and other public bodies (local conservation units, animal charities). As numerate scientists they also enter a wide variety of commercial and business occupations.

### **Opportunities for study abroad**

Students of Biological Sciences can take part in the Erasmus exchange programme in which they can spend the first term of Part 3 studying in a variety of other European Universities. Recent exchanges involving School students have taken place with the following: University of Tours, France; Odense University, Denmark; Uppsala University, Sweden; University College Cork, Ireland; University of Zaragoza, Spain; ENSA, Montpellier, France; University of Cagliari, Sardinia. Students also have the opportunity to go to Rostock University, Germany and Siena University, Italy.

## Programme Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

### Knowledge and Understanding

<p><b>A. Knowledge and understanding of:</b></p> <ol style="list-style-type: none"> <li>1. The basic principles underlying the biological sciences</li> <li>2. The variety of groups of living organisms, from viruses and bacteria to complex multicellular organisms such as mammals and flowering plants</li> <li>3. Different levels of biological organisation of living organisms, from the molecular, biochemical and cellular to the physiological, environmental and ecological</li> <li>4. In depth understanding of least one specialist field of biology, the precise area to be selected by the student.</li> </ol>	<p><b>Teaching/learning methods and strategies</b> Compulsory and optional modules in Parts 1 and 2 introduce students to the diversity of living organisms at a variety of levels. A wide range of teaching strategies is employed in these modules, initially in relatively large-group lecture and practical sessions in Part 1. Smaller group teaching comes to dominate in Parts 2 and 3 and includes, depending on the modules chosen, additional teaching methods such as seminars, fieldwork and discussion sessions. Students within the Environmental stream will also attend full-time field courses during vacations. In Part 3 students will be able to select a specific area of biology for in-depth study and will undertake a research project with one-to-one supervision by a member of academic staff or equivalent.</p> <p><b>Assessment</b> Knowledge and understanding gained in the majority of modules will be assessed by a combination of coursework and formal examination. Some modules, for example field courses, will be assessed by 100% coursework. The project undertaken in Part 3 will be assessed primarily by written report.</p>
--	--

### Skills and other attributes

<p><b>B. Intellectual skills – able to:</b></p> <ol style="list-style-type: none"> <li>1. Address problems in a logical and structured manner</li> <li>2. Manipulate and analyse numerical data</li> <li>3. Construct and test hypotheses</li> <li>4. Critically evaluate scientific literature and data</li> </ol>	<p><b>Teaching/learning methods and strategies</b> Basic skills associated with problem solving and data analysis are taught in specific modules using a variety of teaching methods. These skills are further developed in individual modules, for example on field courses students in small groups will be taught how to construct and logically investigate a hypothesis and to analyse the data produced. In Part 3 students are able to enhance their critical and analytical skills by undertaking a project and to demonstrate this by presenting the results in an accompanying dissertation.</p> <p><b>Assessment</b> Assessment of 1 and 2 is by examination. Critical evaluation of scientific data and literature is assessed in essay and dissertation form.</p>
---	--

<p><b>C. Practical skills</b> – able to:</p> <ol style="list-style-type: none"> <li>1. Conduct practical laboratory and/or fieldwork safely and successfully.</li> <li>2. Design and undertake a programme of scientific investigation</li> </ol>	→	<p><b>Teaching/learning methods and strategies</b>  Practical laboratory skills will be taught in School teaching laboratories while fieldwork forms an integral part of several modules and is specifically taught on field courses. Further practical and field skills may also form part of the Part 3 project, where students will be taught on a one-to-one basis how to design and implement a programme of scientific investigation.</p> <p><b>Assessment</b>  Skill 1 is typically assessed by course work, while skill 2 is assessed by written report.</p>
---	---	--

<p><b>D. Transferable skills:</b></p> <ol style="list-style-type: none"> <li>1. To be able to communicate effectively in both written and oral form</li> <li>2. To be numerate and capable of approaching problems in a logical and structured manner</li> <li>3. To be able to operate effectively as part of a team</li> <li>4. To be familiar with IT operation and resources</li> <li>5. To be able to work independently</li> <li>6. To be able to effectively plan and time manage projects</li> </ol>	→	<p><b>Teaching/learning methods and strategies</b>  Specific modules throughout the programme teach skills 1 to 4 using a combination of seminars, demonstrations and practical approaches. In addition, other modules include aspects of different skills, for example field courses include teamworking as part of structured group work and many modules include an integral component of written and oral communication as coursework. In Part 3 students undertake a detailed solo project during which their individual planning and time management skills are developed through contact with their academic supervisor.</p> <p><i>Assessment</i>  Numeracy and problem solving are assessed by specific exam in the Part 1 module  Experiments: Design and Interpretation, the Part 2 module Statistics for Life Sciences and the Part 3 module Advanced Experimental Design and Interpretation. Other skills are assessed by coursework as part of the Concepts and Skills modules. In addition, most individual modules include written and oral coursework as 30% of the total module assessment.</p>
--	---	--

*Please note:* This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably expect to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the programme handbooks and module descriptions (<http://www.info.rdg.ac.uk/Module/>).