

**BSc Applied Biology**  
**For students entering Part 1 in 2004**

**UCAS CODE: C110**

Awarding Institution:  
Teaching Institution:  
Relevant QAA subject benchmarking group(s):

University of Reading  
University of Reading  
Biosciences  
Programme length: 3 years

Faculty of life Sciences  
Date of specification: April 2006  
Programme Director: Dr D Savva  
Programme Adviser: Prof P. G. Knight  
Board of Studies: Biomolecular Sciences  
Accreditation: None

**Summary of programme aims**

The degree is concerned especially with the diversity of living organisms and includes studies of the biology of all types of organisms from viruses to flowering plants and mammals. The subject matter of Parts 1 and 2 is broadly based with specialisation in Part 3 to provide a coherent, in-depth area of study which the student will select. Students are expected to gain a broad understanding of the concepts underpinning biological sciences and to demonstrate the ability to complete a detailed study of at least one discipline during Part 3. They will receive training and be expected to demonstrate competence in laboratory techniques in biology, the use of computers to access information resources and the use of statistical programmes for data analyses. Students will be expected to acquire individual and group communication skills in written work and in oral and poster presentations. The development of critical reading skills will be strongly encouraged. (For a full statement of the programme aims and learning outcomes see below)

**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

**Programme content**

The profile that follows states which modules must be taken (the compulsory part), together with one or more lists of modules from which the student must make a selection (the 'optional' modules). Students must choose such 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.

**Part 1**

*Compulsory modules (40 or 50 credits)*

AP1A05 *Professional Skills in Applied Biology 1*

*Credits Level*

10 C

BI1C10	<i>Cell Biology and Biochemistry</i>	10	C
BI1C11	<i>Genetics and Molecular Biology</i>	10	C
AM1M11	<i>Fundamental Microbiology</i>	10	C
And if no chemistry has been studied post-16,			
BI1S10	<i>Chemistry for Biologists</i>	10	C

*Optional modules*

Students must choose 80 credits (70 credits if BI1S10 is taken as a compulsory module) from the following Subject Options with a minimum of 10 credits from each Subject Option.

*Subject Option 1. Applied Plant Science – students must select at least 10 credits from:*

*Recommended*

		<i>Credits</i>	<i>Level</i>
PS1BC2	<i>Introductory Botany</i>	10	C
Modules that can be taken in addition to, or instead of PS1BC2 <i>Introductory Botany</i>			
PS1BA1	<i>Plant World</i>	10	C
AP1A12	<i>Introduction to Crop Production</i>	10	C
PS1BA2	<i>Plant Physiology and Development</i>	10	C
PS1HB1	<i>Principles of Horticulture</i>	10	C
PS1HD2	<i>Plants of Horticulture</i>	10	C
PS1HC1	<i>Arboriculture and Practical Horticulture</i>	10	C
PS1HC2	<i>Amenity Horticulture</i>	10	C

*Subject Option 2. Applied Animal Science – students must select at least 10 credits from:-*

*Recommended*

AM1Z10	<i>The Whole Mammal</i>	10	C
Modules that can be taken in addition to, or instead of AM1Z10 <i>The Whole Mammal</i>			
PM1PBA	<i>Physiology A</i>	10	C
AP1A03	<i>Introduction to Livestock Production Systems</i>	10	C

*Subject Option 3. Food BioScience – students must select at least 10 credits from:-*

*Recommended*

AM1C13	<i>Digestion and Nutrition</i>	10	C
Modules that can be taken in addition to, or instead of FB1M1 <i>Foundation Food Microbiology</i>			
FB1EPH	<i>Physical Aspects of Biological Systems</i>	20	C
FB1GFB	<i>Topics in Food and Biotechnology</i>	20	C

*Section Option 4. Biomedical Sciences – students must select at least 10 credits from:-*

*Recommended*

AM1M12	<i>Important Microbes</i>	10	C
Module that can be taken in addition to, or instead of AM1M12 <i>Important Microbes</i>			
AM1C14	<i>Biochemistry and Metabolism</i>	10	C

*Subject Option 5. Rural Ecology and Environment – students must select at least 10 credits from:-*

*Recommended*

		<i>Credits</i>	<i>Level</i>
BI1M10	<i>Biodiversity</i>	10	C
Modules that can be taken in addition to BI1M10 <i>Biodiversity</i>			
BI1Z10	<i>Ecology</i>	10	C
BI1Z11	<i>Community Ecology</i>	10	C
Modules that can be taken in addition to, or instead of BI1M10 <i>Biodiversity</i>			
AP1A01	<i>Introduction to Rural Environmental Science</i>	10	C
PS1AB2	<i>Physical Ecology</i>	10	C

*Subject Option 6. Business and Economics in Applied Biology Sectors – students must select at least 10 credits from:-*

*Recommended*

AP1SB1	<i>Introduction to Management</i>	10	C
Module that can be taken in addition to, or instead of Introduction to Management			
AP1EE1	<i>Economics I</i>	20	C
AP1EM1	<i>Introduction to Marketing</i>	10	C
AP1EE3	<i>Economics IA</i>	10	C
<i>Additional Modules that can be taken</i>			
IWLP	<i>Institution Wide Language Programme</i>	20	C,I,H
	<i>Any other single module available in Part 1 across the University</i>	10	

**Part 2 (three terms)**

*Compulsory modules (20 credits)*

		<i>Credits</i>	<i>Level</i>
AP2A22	<i>Professional Skills in Applied Biology including Career Management Skills</i>	10	I
AS2A1	<i>Statistics for Life Sciences</i>	10	I

*Optional modules (100 credits)*

Students will normally be expected to take one or two of the following Subject Options in Part 2. However, subject to timetabling constraints, and after discussion with the Programme Director to form a coherent course of study, students may choose any combination of Level I modules available within the Faculty of Life Sciences.

AP2A38	<i>Organic Farming</i>	10	I
AP2A25	<i>Grassland Management</i>	10	I
		<i>Credits</i>	<i>Level</i>
PS2HD4	<i>Crop Disease and its Control</i>	10	I
PS2AB5	<i>Crop Pests and Integrated Crop protection</i>	10	I
PS2AA5	<i>Plant Genetics</i>	10	I
PS2AB4	<i>Weed Biology and Control</i>	10	I
AP2A32	<i>Agronomy of Root and Tuber Crops</i>	10	I
PS2HF5	<i>Horticultural Crop Production 2: Fruit Crops</i>	10	I
PS2HG5	<i>Horticultural Crop Production 1: Crops</i>	10	I
PS2HC4	<i>Amenity Turf Management</i>	10	I

*Subject Option 2. Applied Animal Science – students taking this option to obtain at least 40 credits from:-*

AM2Z32	<i>Vertebrate Zoology</i>	10	I
AM2Z33	<i>Animal Behaviour</i>	10	I
AM2Z34	<i>Invertebrate Zoology</i>	10	I
AP2A24	<i>Applied Animal Nutrition</i>	10	I
AP2A34	<i>Animal Breeding and Reproductive Technology</i>	10	I
AP2A35	<i>Animal Health and Welfare</i>	10	I
AP2A36	<i>Animal Production</i>	10	I
AP2A38	<i>Organic Farming</i>	10	I
AP2A25	<i>Grassland Management</i>	10	I

*Subject Option 3. Food Bioscience – students taking this option to obtain at least 40 credits from:-*

FB2N1	<i>Fundamentals of Human Nutrition</i>	20	I
FB2BBE	<i>Biochemistry and Enzymology</i>	10	I
FB2MF1	<i>Microbiology of Food Preservation</i>	10	I
FB2MF2	<i>Microbiological Hazards in Food</i>	10	I

FB2C1	<i>Fundamentals of Food Chemistry</i>	20	I
<i>Subject Option 4. Biomedical Science – students taking this option to obtain at least 40 credits from:-</i>			
AM2C33	<i>Pharmacology and Toxicology</i>	10	I
AM2C34	<i>Introduction to Human Disease</i>	10	I
AM2M31	<i>Viruses and their hosts</i>	10	I
AM2M32	<i>Physiology and Genetics of the Bacteria</i>	10	I
AM2C37	<i>Cardiovascular and Respiratory Systems Physiology</i>	10	I
AM2C38	<i>Receptors and Signal Transduction</i>	10	I
AM2C39	<i>Regulation of Gene Expression</i>	10	I
		<i>Credits</i>	<i>Level</i>
AM2M33	<i>Practical Virology</i>	10	I
AM2M34	<i>Molecular Genetics of Bacteria</i>	10	I
AM2M35	<i>Medical Microbiology</i>	10	I
AM2Z35	<i>Immunology</i>	10	I
<i>Subject Option 5. Rural Ecology and Environment – students taking this option to obtain at least 40 credits from:-</i>			
PS2BC5	<i>Ecological Aspects of Environmental Assessment</i>	10	I
AP2A26	<i>Forestry and Woodlands</i>	10	I
AM2Z37	<i>Aquatic Biology</i>	10	I
PS2BE5	<i>Ecological Biochemistry</i>	10	I
PS2BB4	<i>Evolution and Plant Biodiversity</i>	10	I
AP2A37	<i>Practical Nature Conservation</i>	10	I
<i>Subject Option 6. Business and Economics in Applied Biology Sectors – students taking this option to obtain at least 40 credits from:-</i>			
AP2EP1	<i>Policy Analysis</i>	10	I
AP2EE3	<i>Environmental economics</i>	10	I
AP2EE1	<i>Economics II</i>	20	I
AP2EM1	<i>Marketing Management</i>	10	I
AP2ET1	<i>International Economics</i>	10	I
AP1DV1	<i>International Development: Global &amp; Local Issues</i>	20	I
AP1DV2	<i>International Development: Global &amp; Local Issues</i>	10	I
AP2EC1	<i>Consumer Behaviour</i>	10	I
AP2SB1	<i>Business Management</i>	10	I
AP2SB2	<i>Financial Management</i>	10	I
<i>Additional Modules that can be taken</i>			
IWLP	<i>Institution Wide Language Programme</i>	20	C/I/H

### **Part 3 (three terms)**

#### *Compulsory modules*

One compulsory module, the Research Project, worth 40 credits, occupies 20 credits in Term 7 and 20 credits in Term 8. The Research Project is designed to take students to the cutting edge of biological research.

		<i>Credits</i>	<i>Level</i>
AM3S75	<i>Research Project</i>	40	H

#### *Optional modules*

Students will choose additional modules up to a total of 120 credits subject to the agreement of the Programme Adviser. Details can be found on the University Website at [www.info.rdg.ac.uk/Module/](http://www.info.rdg.ac.uk/Module/). In this final year students will be expected to focus their studies in one of several possible

specialisations, including Zoology, Microbiology, Biochemistry and Botany. No more than 60 credits should be taken in any one term.

### Term 6 (following the Part 2 exams or in the Summer Vacation)

		<i>Credits</i>	<i>Level</i>
AM3Z80	<i>Marine Biology Field Course**</i>	10	H
AP3A75	<i>Equine Management***</i>	10	H

\*\* The Marine Biology Field Course takes place in the Summer Vacation between years 2 and 3. Enrolment for this course will begin during Part 2, following the Christmas Vacation, and you will be advised of the enrolment procedures at this time. Availability to be confirmed.

\*\*\* This module is based at Sparsholt College and runs in week 9. Availability to be confirmed.

<b>Term 7</b>		<i>Credits</i>	<i>Level</i>
AM3C71	<i>Cardiovascular Disease</i>	10	H
AM3C72	<i>Life and Death of the Cell</i>	10	H
AM3C73	<i>Chromosome Mapping and Genetic Disease</i>	10	H
AM3M71	<i>Specialised Groups of Bacteria</i>	10	H
AM3M72	<i>Bacterial Pathogenicity</i>	10	H
AM3Z72	<i>Insects and Society</i>	10	H
AM3Z74	<i>Conservation Biology</i>	10	H
AM3Z75	<i>Evolutionary Genetics and Phylogeny</i>	10	H
PS3AA7	<i>Plant Biotechnology for Post Harvest Quality</i>	10	H
PS3AB7	<i>Crops and Climate</i>	10	H
PS3AE7	<i>Weed Management</i>	10	H
PS3AF7	<i>Mechanism and Process in Plant Disease</i>	10	H
AP3A76	<i>Principles and Practice in Biological Control</i>	10	H
AP3A67	<i>Animal Welfare</i>	10	H

<b>Term 8</b>		<i>Credits</i>	<i>Level</i>
AM3C76	<i>Neurobiology</i>	10	H
AM3C77	<i>Structural Biology</i>	10	H
AM3C78	<i>Mammalian Reproduction</i>	10	H
AM3C79	<i>Pathology and Clinical Biochemistry</i>	10	H
AM3C80	<i>Cancer</i>	10	H
AM3M73	<i>Viruses as Pathogens</i>	10	H
AM3M74	<i>Molecular Microbiology</i>	10	H
AM3Z76	<i>Behavioural Ecology and Life History Theory</i>	10	H
AM3Z77	<i>Research Topics in Ecology and Evolution</i>	10	H
PS3AF8	<i>Plant Tissue Culture</i>	10	H
PS3AG8	<i>Weed Ecology</i>	10	H
PS3BA8	<i>Biodiversity Assessment and the Sustainable Use of Plant Resources</i>	10	H
PS3BC8	<i>Palynology: Pollen in Taxonomy and History</i>	10	H
PS3BD8	<i>Physiological Ecology</i>	10	H
PS3BE8	<i>Biodiversity Informatics</i>	10	H
PS3BG8	<i>Biogeography</i>	10	H
AP3A68	<i>Wildlife in the Farming Environment</i>	10	H
AP3A66	<i>Horses, Dogs and Cats</i>	10	H

## **Progression requirements**

### **Progression from Part 1 to Part 2**

To proceed to Part 2 it is sufficient to have obtained an overall weighted average mark of 40% and have no module mark below 30%. An exception may be made for up to two units scoring below 30%, provided due diligence has been shown by the student during the relevant units and examinations.

### **Progression from Part 2 to Part 3**

To proceed from Part 2 to Part 3 it is sufficient to have obtained an overall weighted average mark of 40% and have no module mark below 30%. An exception may be made for up to two units scoring below 30%, provided due diligence has been shown by the student during the relevant units and examinations.

## **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 Concepts and Skills 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 (AM3S75).

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 A2 or AS subjects including C in at least two A2 science subjects, plus Mathematics, Double Science and English at Grade B at GCSE level.

**International Baccalaureat:** 32 points

**Scottish Highers** BBBB (Biology B)

**Irish Leaving Certificate:** BBBBB (Biology B)

GNVQ is accepted and mature students are also encouraged to apply

Admissions Tutor: Dr P.D.Darbre

## **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, 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 AMS building also houses an extensive Zoological museum and collection and the PSL building a herbarium and adjacent botanic garden. These provide a rich source of material and specimens that are incorporated into several modules.

### **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 SBS students have taken place with the following: University of Uppsala University, Sweden; University College Cork, Ireland; University of Zaragoza, Spain; and Siena University, Italy.

### **Educational aims of the programme**

The BSc in Biological Sciences is concerned especially with the diversity of living organisms. It includes study of the biology of all types of organisms, from microorganisms to flowering plants and mammals, at a level ranging from the molecular, biochemical and cellular to the physiological, environmental and ecological. The subject matter of Parts 1 and 2 is broadly based with specialisation in Part 3 to provide a coherent, in-depth area of study which the student will select. Students are expected to gain a broad understanding of the concepts underpinning biological sciences and to demonstrate the ability to complete a detailed study of at least one discipline during Part 3.

## 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><i>Teaching/learning methods and strategies</i></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 will also have the option of attending 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><i>Assessment</i></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>
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### *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><i>Teaching/learning methods and strategies</i></b> Basic skills associated with problem solving and data analysis are taught in a specific module 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><i>Assessment</i></b> Assessment of 1 and 2 is by examination. Critical evaluation of scientific data and literature is assessed in essay and dissertation form.</p>
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**C. Practical skills – able to:**

1. Conduct practical laboratory and/or fieldwork safely and successfully.
2. Design and undertake a programme of scientific investigation

***Teaching/learning methods and strategies***

Practical laboratory skills will be taught in Departmental teaching laboratories while fieldwork forms an integral part of several modules and is specifically taught on optional 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.

***Assessment***

Skill 1 is typically assessed by course work, while skill 2 is assessed by written report.

**D. Transferable skills:**

1. To be able to communicate effectively in both written and oral form
2. To be numerate and capable of approaching problems in a logical and structured manner
3. To be able to operate effectively as part of a team
4. To be familiar with IT operation and resources
5. To be able to work independently
6. To be able to effectively plan and time manage projects

***Teaching/learning methods and strategies***

Specific Concepts and Skills modules in Parts 1 and 2 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.

***Assessment***

Numeracy and Problem Solving are assessed by specific exam. 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.

**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 be expected 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 module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance processes or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.**