

## **BSc Microbiology**

**UCAS code: C 500**

Awarding Institution:  
Teaching Institution:  
Relevant QAA subject benchmarking group(s)  
Programme length: 3 years  
Faculty of Life Sciences  
For students entering Part 1 in 2002  
Programme Director: Professor IM Jones  
Programme Adviser: Dr Sheila MacIntyre  
Board of Studies: Biomolecular  
Accreditation: None

The University of Reading  
The University of Reading  
Biosciences

Date of specification: March 2004

### **Summary of programme aims**

The course will deliver a broad understanding of the fundamental principles of Microbiology emphasising Bacteriology and Virology. The diverse aspects of the field covered include biochemistry, ecology, genetics, molecular biology, pathogenicity, phylogeny and physiology. In year 1, an understanding of principles of modern biology and basic characteristics of microorganisms will be achieved. By the end of year 2, students will have a deeper understanding of the core areas of microbiology. In the final year, an in-depth comprehension of selected topics at the forefront of Microbiology will be acquired. Students will also develop a range of subject-specific and transferable skills including: practical skills in microbiology and related subjects; an ability to analyse and evaluate scientific information; and experience in the methodology of research and scholarship.

### **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. As part of this programme students are expected to have gained experience and show competence in the following transferable skills: Communication, Numeracy, Problem-solving, Team working, Use of Information Technology, Business Awareness, Information Handling, Career Management.

### **Programme content**

The profile which 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 'selected' 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.

### **Programme content**

#### **Part 1 (three terms)**

##### *Compulsory modules*

		<i>Credits</i>	<i>Level</i>
BI1S11	<i>Concepts and skills in biology 1</i>	10	C
BI1C10	<i>Cell biology and biochemistry</i>	10	C
BI1C11	<i>Genetics and molecular biology</i>	10	C
BI1M10	<i>Biodiversity</i>	10	C

AM1M11	<i>Fundamental microbiology</i>	10	C
AM1M12	<i>Important microbes</i>	10	C
AM1M13	<i>Practical biochemistry</i>	10	C

Students without a post-16 qualification in chemistry must take:

BI1S10	<i>Chemistry for biologists</i>	10	C
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#### *Optional modules*

Students will choose a further 4 or 5 modules up to a final total of 120 credits subject to the agreement of the Programme Adviser.

### **Part 2 (three terms)**

#### *Compulsory modules*

AM2S31	<i>Concepts and skills 2</i>	10	I
AM2C31	<i>Molecular biology and bioinformatics</i>	10	I
AM2M33	<i>Practical virology</i>	10	I
AM2M32	<i>Physiology of the bacterial cell</i>	10	I
AM2M31	<i>Viruses and their hosts</i>	10	I
AM2M34	<i>Molecular genetics of bacteria</i>	10	I
AM2Z35	<i>Immunology</i>	10	I
AM2C39	<i>Regulation of gene expression</i>	10	I
AM2C40	<i>Recombinant DNA exercise</i>	10	I

#### *Optional modules*

Students will choose a further 30 credits subject to the agreement of the Programme Adviser, but will be encouraged to include any of the following:

AM2C35	<i>Cellular biology</i>	10	I
AM2C36	<i>Structural biochemistry</i>	10	I
AM2M35	<i>Medical microbiology</i>	10	I
AM2C34	<i>Introduction to human disease</i>	10	I
CH2S1	<i>Chemistry for AMS students</i>	10	I
PS2HS5	<i>Introduction to fungi</i>	10	I
FB2MF2	<i>Control of microbial hazards in food</i>	10	I

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

#### *Compulsory modules*

AM3S75	<i>Project</i>	40	H
AM3S76	<i>Essays and seminars</i>	20	H
AM3M71	<i>Specialised groups of bacteria</i>	10	H
AM3M72	<i>Bacterial pathogenicity</i>	10	H
AM3M73	<i>Viruses as pathogens</i>	10	H
AM3M74	<i>Molecular microbiology</i>	10	H

#### *Optional modules*

Students will choose a further 20 credits subject to the agreement of the Programme Adviser. Suitable choices would be:

AM3C80	<i>Cancer</i>	10	H
AM3C73	<i>Chromosome mapping and genetic disease</i>	10	H
AM3C77	<i>Structural biology</i>	10	H
AM3C72	<i>Life and death of the cell</i>	10	H

### **Progression requirements**

To proceed to Part 2 it is sufficient to have obtained at least 40% in all modules averaged together and to have no module mark below 30%. However, module marks equivalent to 20 credits may be condoned if the student has attempted the examination and shown reasonable diligence in attending the modules.

To proceed from Part 2 to Part 3 it is sufficient to obtain an overall average of at least 40% and have no module mark below 30%. However, module marks equivalent to 20 credits may be condoned if the student has attempted the examination and shown reasonable diligence in attending the modules.

### **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 (20%) and formal examination (80%).

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 at least 40% in all Part 3 examinations averaged together and must gain at least 40% in the Biology Project module.

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

### **Transferable skills**

By the end of the course students will be expected to have reached an appropriate level of competence in a number of transferable skills which include: the ability to communicate clearly and effectively both orally and in writing, being responsible for their own learning, information retrieval, data handling, the use of information technology and the ability to work effectively as individuals and in a group. Students will have been encouraged to become aware of career opportunities and of the organisation and activities of science-based business and to have taken steps to plan their career path.

### **Admission requirements**

Entrants to this programme are normally expected to have achieved

**UCAS Tariff:** 260 points from no more than 4 A/AS levels, including B in A-level Biology and C in another A-level Science (preferably Chemistry), plus Mathematics, Double Science and English at Grade B at GCSE level. The university supports Key Skills and will take account of points awarded for Key Skills although they are not part of the entry requirements.

**Irish Highers:** BBBBC (inc. Chemistry and preferably Biology)

**IB:** 30 points (including Chemistry and preferably Biology)

Admissions Tutor: Dr S Andrews

### **Career prospects**

Reading Microbiology graduates are qualified to enter a variety of careers in the biological sciences, including work in industry (Pharmaceuticals, biomedical, agrochemicals), the government service (research institutes and bodies such as the Environment Agency) and other public bodies (hospitals, local water authority). As numerate scientists they also enter a wide variety of commercial and business occupations.

### **Opportunities for study abroad**

Students in AMS can take part in the Socrates exchange programme in which they can spend the first term of Part 3 studying in a variety of other European Universities. Recent exchanges have taken place with the Universities of Bergen, Cork, Crete, Montpellier, Rostock, Tours and Uppsala.

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

After Part 1, you will have gained an understanding of several of the basic concepts of modern biochemistry. After Part 2, you will have deepened your understanding of biological concepts and developed a range of expertise over the main areas of the subject. After Part 3, you will have studied selected subjects in depth and will be equipped to tackle detailed problems and analyses.

During these studies you will be exposed to a variety of information sources and techniques and be trained in various skills including those used in reasoning, argument and communication. You will acquire a number of transferable skills including learning how to design and execute experiments (including working in a team), access information, interpret data using statistics and computing, write essays and reports and give oral presentations.

### **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> The fundamental concepts of microbiology underpinned by a knowledge of other branches of molecular and cell biology.</p>	<p><b>Teaching/learning methods and strategies</b></p> <p>Formal lectures and practicals supported by tutorials (in part 1), group work and miniprojects.</p> <p><i>Assessment</i></p> <p>Most knowledge is tested through a combination of coursework and unseen formal examinations. Dissertations, oral and poster presentations also contribute.</p>
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### *Skills and other attributes*

**B. Intellectual skills** – able to:

1. think logically
2. analyse and solve problems.
3. organise tasks in a structured form
4. transfer appropriate knowledge and methods from one topic to another within the overall subject
5. plan, conduct and write a report on an independent project

**Teaching/learning methods and strategies**

Rational thought and logical analysis is developed throughout the programme, building to an ability to deduce how solutions to key problems in biology are derived through the application of experimental procedure.

*Assessment*

Embedded throughout the assessment protocols

**C. Practical skills** – able to:

1. Undertake microbiological laboratory tasks and techniques
2. Plan experiments and carry them out in the laboratory

**Teaching/learning methods and strategies**

Formal practical classes

*Assessment*

By practical laboratory reports.

**D. Transferable skills** – able to:

1. Use IT
2. communicate scientific ideas
3. give oral and poster presentations
4. work as part of a team
5. use library resources
6. manage time
7. plan their career

**Teaching/learning methods and strategies**

The use of IT is embedded throughout the course.

**Assessment**

The skills will enhance the performance of students in both coursework and unseen examinations.

*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 module and programme handbooks.