

**BSc Biochemistry**  
**For students entering Part 1 in 2015/6**

**UCAS code: C700**

|   |                       |
|---|-----------------------|
| Awarding Institution:                       | University of Reading |
| Teaching Institution:                       | University of Reading |
| Relevant QAA subject Benchmarking group(s): | Biosciences           |
| Faculty:                                    | Life Sciences Faculty |
| Programme length:                           | 3 years               |
| Date of specification:                      | 19/Dec/2017           |
| Programme Director:                         | Dr Amanda Callaghan   |
| Programme Advisor:                          | Prof Philippa Darbre  |
| Board of Studies:                           | Biological Sciences   |

**Summary of programme aims**

The aim of the programme is to provide a sound education and training in biochemistry with a firm underpinning of chemistry. Emphasis is placed on the student being able to choose, as the course proceeds, those aspects of biochemistry provided by the participating departments that the student finds most rewarding. 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. They will receive training and be expected to demonstrate competence in laboratory techniques in biochemistry, 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.

**Transferable skills**

During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills. In following this programme, students will have had the opportunity to develop such skills, in particular relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working in the laboratory, and use of information technology, and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum.

Students will also gain experience in the methodology of research and scholarship.

**Programme content**

The profile which follows states which modules must be taken (the compulsory part) and optional modules thought to be most appropriate for biochemists. Students must choose modules offered by the Schools of Biological Sciences, Chemistry, Food and Pharmacy, Agriculture, Policy and Development or other University of Reading Schools and Departments, subject to the agreement of the Programme Advisor, to a total of 120 credits in each Part.

**Part 1 (three terms)**

*Compulsory modules*

| <i>Code</i> | <i>Title</i>   | <i>Credits</i> | <i>Level</i> |
|-------------|--|----------------|--------------|
| BI1BAB2     | Metabolic and Practical Biochemistry                 | 20             | 4            |
| BI1BEC1     | Building Blocks of Life                              | 20             | 4            |
| BI1BF1      | Laboratory and Study Skills for Biomedicine          | 10             | 4            |
| BI1BI12     | Key Skills for Biochemistry                          | 10             | 4            |
| BI1S1       | Introductory Microbiology                            | 10             | 4            |
| CH1OR2      | Fundamentals of Organic Chemistry                    | 10             | 4            |
| CH1OR4      | Further Fundamental Organic Chemistry for Biologists | 10             | 4            |

*Optional modules*

Students will choose further modules, to achieve a total of 120 credits, from the list of recommendations below. Subject to agreement from the Programme Advisor, alternative modules may be chosen from the School of Biological Sciences or, exceptionally, from other Schools. Timetable restrictions may apply.

| <i>Code</i> | <i>Title</i>              | <i>Credits</i> | <i>Level</i> |
|-------------|---------------------------|----------------|--------------|
| BI1BAC2     | Bacteriology and Virology | 10             | 4            |

|         |                                     |    |     |
|---------|-------------------------------------|----|-----|
| BI1BAD2 | Pathology and Histology             | 20 | 4   |
| BI1BH12 | Human Physiology                    | 20 | 4   |
| CH1PH2  | Physical Processes for Biologists   | 10 | 4   |
| LA1XX1  | Institution-Wide Language Programme | 20 | 4/5 |

## Part 2 (three terms)

### Compulsory modules

| <i>Code</i> | <i>Title</i>                   | <i>Credits</i> | <i>Level</i> |
|-------------|--------------------------------|----------------|--------------|
| BI2BE4      | Pharmacology and Toxicology    | 10             | 5            |
| BI2BC45     | Cells and Immunity             | 20             | 5            |
| BI2BL5      | Protein Structure and Function | 10             | 5            |
| BI2BM45     | Key Skills in Biomedicine      | 10             | 5            |
| BI2BMG4     | Molecular Genetics             | 20             | 5            |

### Optional modules

Students will choose further modules, to achieve a total of 120 credits, from the list of recommendations below. Subject to agreement from the Programme Advisor, alternative modules may be chosen from the School of Biological Sciences or, exceptionally, from other Schools. Timetable restrictions may apply.

| <i>Code</i> | <i>Title</i>   | <i>Credits</i> | <i>Level</i> |
|-------------|--|----------------|--------------|
| BI2BB4      | Endocrinology  | 10             | 5            |
| BI2BC4      | Human Development, Organogenesis and Anatomy             | 10             | 5            |
| BI2BI45     | Infectious Diseases                                      | 20             | 5            |
| BI2BR5      | The Bacterial Cell                                       | 10             | 5            |
| BI2BT5      | Introduction to Bioinformatics and Computational Biology | 10             | 5            |
| BI2BCB5     | Clinical Biomedicine                                     | 20             | 5            |
| BI2EVP5     | Venoms and Poisons                                       | 10             | 5            |
| BI2PLA*     | Summer Placement   | 10             | 5            |
| CH2MC2      | Medicinal Chemistry for Chemists                         | 10             | 5            |
| CH2OR1      | Further Organic Chemistry                                | 20             | 5            |
| MM270       | Practice of Entrepreneurship                             | 20             | 5            |

\*Takes place in the summer vacation, after Part 1 examinations

## Part 3 (three terms)

### Compulsory modules

| <i>Code</i> | <i>Title</i>                    | <i>Credits</i> | <i>Level</i> |
|-------------|---------------------------------|----------------|--------------|
| BI3PROB     | Research Project - Biomolecular | 40             | 6            |

### Optional modules

Students will choose further modules, to achieve a total of 120 credits, from the list of recommendations below. Subject to agreement from the Programme Adviser, alternative modules may be chosen from the School of Biological Sciences or, exceptionally, from other Schools. Timetable restrictions may apply.

| <i>Code</i> | <i>Title</i>   | <i>Credits</i> | <i>Level</i> |
|-------------|--|----------------|--------------|
| BI3BA7      | Medical Genetics                                       | 10             | 6            |
| BI3BB7      | Selected Topics in Endocrinology and Endocrine Disease | 10             | 6            |
| BI3BC7      | Bacterial Pathogens                                    | 10             | 6            |
| BI3BE8      | Cardiovascular Disease                                 | 10             | 6            |
| BI3BG8      | Mechanisms for Microbial Function                      | 10             | 6            |
| BI3BH8      | Mammalian Reproduction                                 | 10             | 6            |
| BI3BI8      | Neurobiology   | 10             | 6            |
| BI3BJ8      | Viral Pathogens  | 10             | 6            |

|         |   |    |   |
|---------|---|----|---|
| BI3BP7  | Systems Biology                                 | 10 | 6 |
| BI3BR7  | Structural Proteomics                           | 10 | 6 |
| BI3B67  | Microbiology Field Course*                      | 20 | 6 |
| BI3BXX1 | Cancer and Cell Communication                   | 20 | 6 |
| BI3BQ78 | Bacterial Pathogens and Experimental Approaches | 20 | 6 |
| BI3EP7  | Wildlife Diseases                               | 10 | 6 |
| BI3S78  | Seminars in Biology                             | 10 | 6 |
| FB3NHD  | Nutrition, Health and Disease                   | 20 | 6 |
| FB3NGLA | Genes, Lifestyle and Nutrition                  | 10 | 6 |

\* Takes place in Summer Term, after Part 2 examinations

### Progression requirements

To gain a threshold performance at Part 1 and qualify for the CertHE, 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 and qualify for the DipHE, a student shall normally be required to achieve:

an overall average of 40% over 120 credits taken at Part 2; and marks of at least 40% in modules amounting to not less than 80 credits; and

marks of at least 30% in individual modules amounting to not less than 120 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.

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%, at least 40% in modules amounting to 80 credits in Part 3, and must gain a mark of at least 40% in the Research Project module. For a Pass degree, candidates must have an average of at least 35% and at least 35% in modules amounting to 80 credits in Part 3 and must gain a mark of at least 35% in the Research Project module.

### Summary of Teaching and Assessment

The University's honours classification scheme is:

| Mark       | Interpretation         |
|------------|------------------------|
| 70% - 100% | First class            |
| 60% - 69%  | Upper Second class     |
| 50% - 59%  | Lower Second class     |
| 40% - 49%  | Third class            |
| 35% - 39%  | Below Honours Standard |
| 0% - 34%   | Fail                   |

For the University-wide framework for classification, which includes details of the classification method, please see: [www.reading.ac.uk/internal/exams/Policies/eva-class.aspx](http://www.reading.ac.uk/internal/exams/Policies/eva-class.aspx).

The weighting of the Parts/Years in the calculation of the degree classification is:

### Three-year programmes

Part 2 one-third

Part 3 two-thirds

Teaching is organised in modules. Teaching in Part 1 consists of lectures, practical classes and small-group work. Modules can be assessed by 100% coursework but more usually are assessed by a combination of coursework and formal examination.

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

### **Admission requirements**

Entrants to this programme are normally required to have obtained:

#### **UCAS Tariff**

Grades BBB/ABC from three A levels including Biology at grade B plus one other science.

Grades ABB from three A levels including Biology will also be considered for applicants without a second science A level.

Acceptable science subjects: Chemistry, Physics, Maths, Further Maths, Statistics, Psychology, Geography, Applied Science, Environmental Studies, Geology.

Exclusions General Studies, Critical Thinking and Citizenship A levels, Key Skills and the Extended Project. International Baccalaureate: 30 points overall including 6 in Biology and 5 in a second science, both at higher level.

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

**Admissions Tutor:** Dr David Leake and Dr Samuel Boateng

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

University support for students and their learning falls into two categories. Learning support is provided by a wide array of services across the University, including: the University Library, In-session English Support Programme, the Study Advice and Mathematics Support teams and IT Services. 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 Tutors, the Students' Union, the Medical Practice and the Support Centres. If a student has a general enquiry and is unsure where to seek help, they should visit their Support Centre. There are five Support Centres across the University, including one based at the London Road Campus. The Support Centre will be able to advise on matters such as extenuating circumstances, module selection, suspensions, withdrawals, timetable queries and transferring programme. The Support Centre will also be able to signpost students to Carrington building where other University services related to disability, financial support, counselling and wellbeing, accommodation and careers can be found. More information on what student services are available can be found here: <http://student.reading.ac.uk/essentials>.

The Programme Advisor is available to offer advice on the choice of modules within the degree course.

### **Career learning**

#### **Career prospects**

After graduation, students will be qualified to undertake a career in a range of areas, or to use skills and problem-solving abilities in careers not directly related to biochemistry. Honours graduates will be eligible for graduate membership of the Institute of Biology which could lead to Chartered Biologist status. You will be qualified to enter a variety of careers, including work in industry (pharmaceuticals, biomedical, agrochemicals), government service (research institutes and bodies such as the Environment Agency) and other public bodies. As numerate scientists you could also enter a wide variety of commercial and business occupations.

### **Opportunities for study abroad**

As part of the degree programme students have the opportunity to study abroad at an institution with which the University has a valid agreement.

#### **Study Abroad:**

The Erasmus programme enables undergraduates to undertake project work for one term in their final year at one of a number of European Universities. Recent exchanges involving School of Biological Science 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.

### **Placement opportunities**

#### **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.

### **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**

##### **A. Knowledge and understanding of:**

The fundamental concepts of the chemistry that supports biological processes such as metabolism, synthetic pathways and enzyme catalysis, underpinned by a knowledge of organic and other branches of chemistry, and their application to biological systems.

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

Compulsory and optional modules in Parts 1 and 2 introduce students to the chemistry that underpins 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, and tutorials in chosen biochemical aspects of the modules offered. In Part 3 students will be able to select a specific area of biochemistry for in-depth study and will undertake a research project with one-to-one supervision by a member of academic staff or equivalent.

##### *Assessment*

Most knowledge is tested through a combination of coursework and unseen formal examinations. Dissertations, oral and poster presentations also contribute.

#### **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
6. Design experiments to test specific hypotheses.

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

Rational thought and logical analysis is embedded throughout the programme, where solutions to key problems in biology have come about through the application of chemical and biochemical concepts and experiments. 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 in the Biochemistry and Metabolism module students will carry out a series of experiments that build on each other to address a specific scientific problem and then analyse and report on the results. 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.

##### *Assessment*

Assessment is predominantly by examination. Critical evaluation of scientific data and literature is

assessed in essay and dissertation form.

### **C. Practical skills - *able to*:**

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

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

Practical laboratory skills will be taught in School teaching laboratories. Further practical 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*

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**

Modules in Parts 1 and 2 teach skills using a combination of seminars, demonstrations and practical approaches. In addition, other modules include aspects of different skills. 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 in course during experimental design modules. Other skills are assessed by coursework as part of the science communication module. In addition, most individual modules include written and oral coursework as 30% of the total module assessment. The use of IT is embedded throughout the course.

**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 process or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.**