

## PROGRAMME SPECIFICATION

### Course record information

Name and level of final award:	Biochemistry BSc Honours The Biochemistry BSc (Hons) is a BSc degree that is Bologna FQ-EHEA first cycle degree or diploma compatible.
Name and level of intermediate awards:	Diploma of Higher Education in Biochemistry Certificate of Higher Education in Life Sciences
Awarding body/institution:	University of Westminster
Teaching Institution:	University of Westminster
Status of awarding body/institution:	Recognised Body
Location of delivery:	Central London
Language of delivery and assessment:	English
Mode, length of study and normal starting month:	Three years full time. September start.
<a href="http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Biosciences.pdf">QAA subject benchmarking group(s)</a> :	<a href="http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Biosciences.pdf">http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Biosciences.pdf</a>
Professional statutory or regulatory body:	Recognition or Accreditation by the Society of Biology will be sought once the new programme is approved.
Date of course validation/review:	6 June 2016
Date of programme specification approval:	22 August 2016
Valid for cohorts :	From September 2017
Course Leader	Dr Stuart Thompson
UCAS code and URL:	C700 <a href="http://www.westminster.ac.uk/courses/undergraduate">http://www.westminster.ac.uk/courses/undergraduate</a>

## Admissions requirements

There are standard minimum [entry requirements](#) for all undergraduate courses. Students are advised to check the standard requirements for the most up-to-date information.

[westminster.ac.uk/courses/undergraduate/how-to-apply](http://westminster.ac.uk/courses/undergraduate/how-to-apply)

For most courses a decision will be made on the basis of your application form alone. However, for some courses the selection process may include an interview to demonstrate your strengths in addition to any formal entry requirements.

More information can be found here: [westminster.ac.uk/courses/undergraduate/how-to-apply](http://westminster.ac.uk/courses/undergraduate/how-to-apply)

## Aims of the course

The Biochemistry BSc (Hons) course has been designed to:

- Provide you with a solid grounding in biochemistry as well as the skills required to expand upon your subject knowledge and keep pace with new developments.
- Equip you to work as a researcher in the field of biochemistry by developing your skills in an appropriate range of laboratory and other research techniques.
- Enable you to critically, rigorously and logically analyse problems and arguments.
- Develop your ability to analyse and interpret numerical and non-numerical data using appropriate mathematical and statistical tools.
- Prepare you to apply your skills and subject knowledge to the challenges facing the world now and in the future.
- Develop your transferable skills so that you can use them in a variety of scientific and other professional working environments.
- Prepare you for postgraduate study in biochemistry or related practical and theoretical disciplines.

## What will you be expected to achieve?

Learning outcomes are statements on what successful students have achieved as the result of learning. These are threshold statements of achievement the learning outcomes broadly fall into four categories:

- The overall **knowledge and understanding** you will gain from your course (KU).
- **Graduate attributes** are characteristics that you will have developed during the duration of your course (GA).
- **Professional and personal practice learning outcomes** are specific skills that you will be expected to have gained on successful completion of the course (PPP)
- **Key transferable skills** that you will be expected to have gained on successful completion of the course. (KTS)

Appendix 1 shows where the learning outcomes below are met.

Level 4 learning outcomes

**Upon completion of level 4 you will be able to demonstrate:**

KU LO4.1- A basic understanding of the molecules involved in biochemical processes and their underlying chemistry and relate this knowledge to cells and whole organisms.

KU LO4.2- Design and conduct of simple experiments using some key equipment and techniques effectively.

KU LO4.3- Understanding of the contribution that science and the biological sciences have made to human knowledge, and quality of life historically and in the modern world and an appreciation of their importance in addressing present and future challenges.

PPP LO4.1- Understanding of the nature of scientific knowledge and the importance of designing research programmes to effectively and critically test hypotheses.

PPP LO4.2- Knowledge of how scientists communicate their findings, and selecting and comprehension of appropriate scientific sources related to specific problems.

PPP LO4.3- Recognition of key issues in presenting and interpreting numerical data and correct completion of key basic chemical and biochemical calculations.

KTS LO4.1- Understanding of the principles of scientific practice including the importance of questioning assumptions and of professional standards and ethical conduct.

KTS LO4.2- Write short reports in clear and appropriate scientific English.

KTS LO4.3- Appreciate the importance of multidisciplinary approaches in modern science and be able to work in small groups to complete limited tasks effectively.

Level 5 learning outcomes

**Upon completion of level 5 you will be able to demonstrate:**

KU LO5.1- An understanding of key metabolic processes and of genes and gene expression in living organisms and of the evolutionary basis of gene and protein sequences.

KU LO5.2- Design and successful completion of short series of experiments to test hypotheses.

KU LO5.3- Evaluation of the social and environmental context of biochemical research and its application to understanding and solving contemporary challenges.

PPP LO5.1- Planning of a rigorous and thorough biochemical research programme to address a specific question.

PPP LO5.2- Identification and comprehension of multiple scientific sources in the scientific literature and in databases and development of reasoned conclusions based upon the information they present.

PPP LO5.3- Application of the principles of statistical analysis to selection of appropriate mathematical and statistical tools and mathematical and graphical analysis of biochemical data.

KTS LO5.1- That they can work within the norms of the scientific professional community including awareness of the social responsibilities that this involves and the critical importance of honest and accurate recording and reporting.

KTS LO5.2- Communicate findings and conclusions based upon their own investigations or the reported findings of others clearly and cogently in correct and appropriate scientific English.

KTS LO5.3- Work in well organised groups to plan and complete tasks and use modern multidisciplinary methods, e.g. in silico, for analysing biochemical problems.

Level 6 learning outcomes

**Upon completion of level 6 you will be able to demonstrate:**

KU LO6.1- A detailed understanding of the relationship between structure and function for molecules, reactions and processes that underlie life on Earth and place them in their biological context.

KU LO6.2- Design and execution of a programme of experiments, selecting and utilising appropriate apparatus and techniques to solve a biochemical problem.

KU LO6.3- Identification of areas in which biochemists can help address global challenges and consideration of how they could apply their own knowledge and skills to such goals.

PPP LO6.1- Planning and conduct of a biochemical research programme that rigorously tests hypotheses and thereby expands upon current knowledge.

PPP LO6.2- Identification, critical evaluation and synthesis of multiple sources of information to expand and develop their knowledge and understanding in biochemistry and related disciplines.

PPP LO6.3- Analysis and interpretation of complex numerical and non-numerical data using appropriate mathematical and statistical tools and clear presentation of data so that they support reasoned conclusions.

KTS LO6.1- Conduct appropriate to a professional, identifying strategies for achieving goals, including evaluation of the consequences of their actions and implementation of these plans under their own direction.

KTS LO6.2- Effectively communicate complex arguments at length in correct and appropriate scientific English and communicate their knowledge and conclusions to non-specialists.

KTS LO6.3- Plan and work in groups to achieve common goals dividing tasks to take full advantage of the diversity of skills and knowledge in the group.

Course level learning outcomes and graduate attributes are mapped to the modules in which they will be delivered in Appendix 1 and Table 1.

### **How will you learn?**

In this degree you will gain a sound foundation in biochemistry, molecular biology and a sound preparation in biochemical laboratory techniques and research tools. A core component of

your final year is a project, in which you will undertake original research of your own under staff guidance in one of the diverse areas of biochemical research at Westminster.

Biochemistry is a pivotal degree discipline in the modern world and is fundamental to most of the biological sciences. Therefore biochemistry is intrinsically multidisciplinary and central to research and technological advances in many areas including the pharmaceutical industry, medical research, environmental technologies and food security. This is reflected in a range of option modules that allow you to develop your own specific interests and to acquire skills appropriate for your intended career.

The learning and teaching opportunities for the BSc Biochemistry course will be a mixture of face to face teaching, independent work, laboratory work and training and online support activities. The face to face element will consist of large and small group lectures, seminars, tutorials, practicals and enquiry (problem) based learning and “flipped learning” sessions in which you use online material to prepare for tutorials in which academics guide you in the application of what you have learned.

Laboratory skills are critical for a biochemist and the Biochemistry course at Westminster includes a strong programme of laboratory sessions. Likewise computer based techniques are increasingly important to biochemistry and related fields and you will receive hands on training in bioinformatics.

Core lectures will generally address the whole year group, but in most modules these will be supported by learning activities in smaller tutorial groups. Module practicals will take place in the teaching laboratories at the New Cavendish Street site. Your final year Project will be supported through focused tuition with your supervisor and you will be able to carry out your experimental work in the research facilities at the New Cavendish Street site.

Online resources will be provided where possible to help support you in your learning and some modules will make substantial use of blended learning approaches. You will be also be tasked with finding alternative resources for your own development after appropriate preparation. You will be supported in working independently to consolidate and enhance your understanding of the topics being taught.

The scheduled / supervised time represents only a proportion of study for each module (approximately one third overall). The remaining time is self-managed by you, so offering scope for you to develop your own knowledge and understanding, exploration and the emergence of the autonomy required of you in professional life.

### **How will you be assessed?**

Assessment is an important tool for guiding your studies and helping you to improve your skills, knowledge and understanding. Your modules all use a mixture of “summative” assessments (in which the marks contribute to your overall module mark and can contribute to your degree classification) and “formative” assessments (which do not contribute to your mark but provide a vehicle for feedback to guide you in furthering your studies and assist you in optimising your performance in the summative assessments). You will also receive informal feedback in discussions with academic staff in tutorials and other sessions. This will include immediate guidance on how to improve your technical skills and laboratory practice during practicals and small group sessions discussing your final year project with your project supervisor.

Biochemistry graduates are expected to display a range of skills and personal qualities as well as a wide knowledge of biochemistry and related disciplines and this is reflected in use of a number of diverse assessment types during your degree.

Many modules will use examinations and in-class tests. These can be used to evaluate your knowledge and understanding and your ability to construct reasoned arguments based on your knowledge. However, your skill in problem solving, analysing and interpreting data and carrying out calculations are also sometimes tested in this way and many of these are partly or completely “open book”.

Laboratory skills are a fundamental aspect of professional practice for a biochemist and both formative and summative practical based assessments will test your ability to work accurately, effectively and safely while using a number of key techniques. Your accounts of your work allow you to demonstrate that you can interpret data and report research clearly, concisely and honestly. This will sometimes be as a conventional scientific report but in some modules you will be asked to use other formats such as posters, presentations or passages in a laboratory notebook.

Other types of assessment used to evaluate various graduate skills and aspects of scientific understanding, communication and practice may include essays, posters and other presentations, wikis and blogs and data analysis and interpretation exercises.

Working in groups or teams is essential in most careers, whether in science or in other areas, and you will work with other students to complete some assessments to help you develop these skills.

In your final year research project you will plan and carry out a short research programme investigating an appropriate subject. The primary assessment is a thesis written in the style of a short scientific paper thus testing the design and conduct of the project, the quality of data obtained, its analysis and interpretation, and the formation of reasoned conclusions based upon the results in the context of previous work in the area, as well as the clarity and professionalism with which the work is communicated. Therefore this brings together multiple aspects of your degree and provides direct evidence of your ability to work independently as a scientific professional.

Additionally, some modules assess learning outcomes or content from another module (called ‘synoptic assessment’). This requires you to synthesise skills and knowledge from different modules and thereby promotes a broader perspective in your learning and encourages you to cultivate a flexible attitude that is receptive to multidisciplinary approaches.

## **Employment and further study opportunities**

University of Westminster graduates will be able to demonstrate the following five Graduate Attributes:

- Critical and creative thinkers
- Literate and effective communicator
- Entrepreneurial
- Global in outlook and engaged in communities
- Social, ethically and environmentally aware

These attributes reflect the requirements of the dynamic employment markets in which our graduates will find themselves developing these qualities will equip you to prosper in them.

**Table 1**  
**Alignment of Graduate Attributes to Course Learning Outcomes**

<b>Graduate Attribute</b>	<b>Evident in Course Learning Outcomes</b>
Critical and creative thinker	KU4.2, KU5.2, <b>KU6.2</b> PPP4.1, PPP5.1, <b>PPP6.1</b> PPP4.2, PPP5.2, <b>PPP6.2</b> KTS4.1, KTS5.1, <b>KTS6.1</b>
Literate and effective communicator	KTS4.2, KTS5.2, <b>KTS6.2</b>
Entrepreneurial	KU4.3, KU5.3, <b>KU6.3</b> KTS4.1, KTS5.1, <b>KTS6.1</b> KTS4.3, KTS5.3, <b>KTS6.3</b>
Global in outlook and engaged in communities	KU4.3, KU5.3, <b>KU6.3</b>
Socially, ethically and environmentally aware	KU4.3, KU5.3, <b>KU6.3</b> KTS4.1, KTS5.1, <b>KTS6.1</b>

University of Westminster courses capitalise on the benefits that London as a global city and as a major creative, intellectual and technology hub has to offer for the learning environment and experience of our students.

The Biochemistry BSc (Hons) course aims to create graduates who are:

- Knowledgeable in their subject and able to expand upon that knowledge
- Problem solvers who are curious, flexible, rigorous and willing to trust to their own initiative
- Aware of the importance of their discipline in shaping the modern world and its role in providing solutions for the problems we face
- Able to consider all perspectives and to collaborate with others with different areas of expertise
- Professional and principled in their outlook

This course will give you the skills and knowledge to establish yourself in a range of careers related to biochemistry, including the pharmaceutical, diagnostic and water industries and can form a foundation for further study.

Biochemistry graduates are also scientifically literate, capable of logical and critical analysis and numerate and these skills developed during your time at Westminster will stand you in good stead in the jobs market.

### **Course structure**

This section shows the core and option modules available as part of the course and their credit value. Full-time Undergraduate students study 120 credits per year. Course structures can be subject to change each academic year following feedback from a variety of sources.

Note that the majority of options offered will run as core modules in other cognate courses.

<b>Credit Level 4</b>				
<b>Module code</b>	<b>Module title</b>	<b>Status</b>	<b>UK credit</b>	<b>ECTS</b>
4BICH003W	Science: History, Philosophy and Practice	Core	20	10
4BICH001W	Biochemistry	Core	20	10
4BIOL002W	Cell Biology	Core	20	10
4PHYM001W	Human Physiology	Core	20	10
4BICH002W	Biological Chemistry	Core	20	10
4PHYM002W	Fundamentals of Pharmacology	Option	20	10
4BIOL001W	Applications of Biological Sciences	Option	20	10
4HRBM002W	Botany	Option	20	10
	University Elective	Option	20	10
<b>Award of Certificate of Higher Education available</b>				
<b>Credit Level 5</b>				
<b>Module code</b>	<b>Module title</b>	<b>Status</b>	<b>UK credit</b>	<b>ECTS</b>
5BIOM010W	Research Methods	Core	20	10
5BICH002W	Bioinformatics	Core	20	10
5BICH003W	Molecular Biology and Genetics	Core	20	10
5BICH001W	Metabolic Biochemistry	Core	20	10
5PHYM001W	Medical Physiology	Option	20	10
5PHYM003W	Systems Pharmacology	Option	20	10
5PHYM002W	Physiological Networks	Option	20	10
5EVBI001W	Contemporary Global Issues	Option	20	10
5BIOL001W	Exploring the Microbial World	Option	20	10
5EVBI002W	Urban Living and the Environment	Option	20	10
5BIOM002W	Medical Genetics in Practice	Option	20	10
5BIOM003W	Molecular and Cellular Therapeutics	Option	20	10
5BIOM008W	Infection and Immunity	Option	20	10
	University Elective	Option	20	10
<b>Award of Diploma of Higher Education available</b>				
<b>Credit Level 6</b>				
<b>Module code</b>	<b>Module title</b>	<b>Status</b>	<b>UK credit</b>	<b>ECTS</b>
6BICH003W	UG Research Project	Core	40	20
6BIOL002W	Advanced Cell Biology	Core	20	10
6BICH002W	Proteins and Enzymes	Core	20	10
6PHYM003W	Advanced Pharmacology & Toxicology	Option	20	10
6BIOL004W	Work Experience and Career Management Skills	Option	20	10

6EVBI001W	Global Ethics	Option	20	10
6BIOL001W	Designing a Sustainable World	Option	20	10
6BIOL003W	Applied Biotechnology	Option	20	10
6BICH001W	Advanced Molecular Biology	Option	20	10
6BIOM007W	Cancer Biology	Option	20	10
	University Elective	Option	20	10
<b>Award BSc available</b>				
<b>Award BSc Honours available.</b>				

Please note: Not all option modules will necessarily be offered in any one year.

### **Professional Body Accreditation or other external references**

The previous Biochemistry BSc (Hons) course was recognised by the Society of Biology until 2014. New recognition or accreditation will be sought for the re-approved programme.

### **Academic regulations**

The current Handbook of Academic Regulations is available at [westminster.ac.uk/academic-regulations](http://westminster.ac.uk/academic-regulations)

### **How will you be supported in your studies?**

#### **Course Management**

Your course is managed through the Department of Life Sciences within the Faculty of Science & Technology. The Course Leader and the teaching team will meet you in the induction programme and can help you with enrolment, registration, and orientation to the university, its processes and the culture of higher education. The Course Leader is responsible for development and management of the course in conjunction with the Head of Department, the Faculty Director of Learning and Teaching and the departmental Learning & Teaching co-ordinator.

The course is monitored each year by senior members of the Faculty to ensure that it is running effectively and that issues that might affect the student experience have been appropriately addressed. Each course will have Course Committee meetings throughout the year and staff will consider the outcomes from these meetings, evidence of student progression and achievement to evaluate the effectiveness of the course. The Academic Standards Group audits this process and the outcomes are reported to the Academic Council of the University, which has overall responsibility for the maintenance of quality and standards in the University.

#### **Academic Support**

Upon arrival, an induction programme will introduce you to the staff responsible for the course, the campus on which you will be studying, the Library and IT facilities, additional support available and to your Faculty Registry Office. You will be provided with the Course Handbook, which provides detailed information about the course. Each course has a course leader or Director of Studies. All students enrolled on a full-time course and part time students registered for more than 60 credits a year have a personal tutor, who provides advice and guidance on academic matters. The University uses a Virtual Learning Environment called Blackboard where students access their course materials, and can communicate and collaborate with staff and other students

## Learning Support

The Academic Learning Development Centre supports students in developing the skills required for higher education. As well as online resources in Blackboard, students have the opportunity to attend Study Skills workshops and one to one appointments.

Learning support includes four libraries, each holding a collection of resources related to the subjects taught at that site. Students<sup>1</sup> can search the entire library collection online through the Library Search service to find and reserve printed books, and access electronic resources (databases, e-journals, e-books). Students can choose to study in the libraries, which have areas for silent and group study, desktop computers, laptops for loan, photocopying and printing services. They can also choose from several computer rooms at each campus where desktop computers are available with the general and specialist software that supports the courses taught at their Faculty. Students can also securely connect their own laptops and mobile devices to the University wireless network.

## Support Services

The University of Westminster Student Affairs department provide advice and guidance on accommodation, financial and legal matters, personal counselling, health and disability issues, careers, specialist advice for international students and the chaplaincy providing multi-faith guidance. The University of Westminster Students' Union also provides a range of facilities to support students during their time at the University.

How do we ensure the quality of our courses and continuous improvement?

The course was initially approved by a University Validation Panel in **1992**. The panel included internal peers from the University, academic(s) from another university and a representative from industry. This helps to ensure the comparability of the course to those offered in other universities and the relevance to employers.

The course is also monitored each year by the Faculty to ensure it is running effectively and that issues which might affect the student experience have been appropriately addressed. Staff will consider evidence about the course, including the outcomes from Course Committees, evidence of student progression and achievement and the reports from external examiners, to evaluate the effectiveness of the course. Each Faculty puts in to place an action plan. This may for example include making changes on the way the module is taught, assessed or even how the course is structured in order to improve the course, in such cases an approval process is in place.

A Course review takes place periodically to ensure that the curriculum is up-to-date and that the skills gained on the course continue to be relevant to employers. Students meet with review panels to provide feedback on their experiences. Student feedback from previous years e.g. from Course Committees is also part of the evidence used to assess how the course has been running.

## How do we act on student feedback?

Student feedback is important to the University and student views are taken seriously. Student feedback is gathered in a variety of ways.

- Through Course Committees students have the opportunity to express their voice in the running of their course. Student representatives are elected to Committee to expressly represent the views of their peer. The University and the Students' Union work together to provide a full induction to the role of the student representatives.

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<sup>1</sup> Students enrolled at Collaborative partners may have differing access due to licence agreements.

- Each Faculty also has its own Faculty Student Forum with student representatives; this enables wider discussions across the Faculty. Student representatives are also represented on key Faculty and university committees.
- All students are invited to complete a questionnaire before the end of each module. The feedback from this will inform the module leader on the effectiveness of the module and highlight areas that could be enhanced.
- The University also has an annual Student Experience Survey which seeks the opinions of students about their course and University experience. Final year Undergraduate students will be asked to complete the National Student Survey which helps to inform the national university league tables.

**Please note:** This programme specification provides a concise summary of the main features of the course and the learning outcomes that a student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. This specification should be read in conjunction with the Course Handbook provided to students and Module Handbooks, which provide more detailed information on the specific learning outcomes, content, teaching, learning and assessment methods for each module.

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## Appendix 1

Course level learning outcomes are mapped to the modules in which they are delivered in the table below.

*Upon completion of each level you will be able to demonstrate:*

Modules	Level 4 – Course Learning Outcomes								
	KU LO4.1	KU LO4.2	KU LO4.3	PPP LO4.1	PPP LO4.2	PPP LO4.3	KTS LO4.1	KTS LO4.2	KTS LO4.3
Science: History, Philosophy and Practice		✓	✓	✓	✓	✓	✓	✓	✓
Biochemistry	✓	✓	✓	✓					
Cell Biology	✓	✓				✓	✓	✓	✓
Human Physiology	✓	✓							
Biological Chemistry	✓					✓			

Modules	Level 5 – Course Learning Outcomes								
	KU LO5.1	KU LO5.2	KU LO5.3	PPP LO5.1	PPP LO5.2	PPP LO5.3	KTS LO5.1	KTS LO5.2	KTS LO5.3
Research Methods		✓	✓	✓	✓	✓	✓	✓	
Bioinformatics	✓				✓		✓		✓
Molecular Biology and Genetics	✓	✓	✓	✓					✓
Metabolic Biochemistry	✓		✓		✓	✓		✓	

Modules	Level 6 – Course Learning Outcomes								
	KU LO6.1	KU LO6.2	KU LO6.3	PPP LO6.1	PPP LO6.2	PPP LO6.3	KTS LO6.1	KTS LO6.2	KTS LO6.3
UG Research Project		✓		✓	✓	✓	✓	✓	
Molecular Cell Biology	✓		✓		✓		✓	✓	
Proteins and Enzymes	✓	✓			✓		✓		✓