

## Royal Holloway, University of London

### Course specification for an undergraduate award

### BSc Biochemistry with a Year in Industry (C702)

#### Section 1 – Introduction to your course

This course specification is a formal document, which provides a summary of the main features of your course and the learning outcomes that you might reasonably be expected to achieve and demonstrate if you take full advantage of the learning opportunities that are provided. Further information is contained in the College prospectus, and in various handbooks, all of which you will be able to access online. Alternatively, further information on the College's academic regulations and policies can be found [here](#). Further information on the College's Admissions Policy can be found [here](#).

Your degree course in Biochemistry with a Year in Industry is delivered in four stages, each of which, apart from the year in industry, comprises one year of full-time study, during which you must follow modules to the value of 120 national credits. The curriculum is based around a core of mandatory modules and the course offers a strong foundation in Stages one and two, which cover the requirements of the benchmarking statements in molecular aspects of biology (including biochemistry).

**Stage one** provides a set of mandatory modules (totalling 90 credits) that seek to provide the necessary grounding for the study of the subject at degree level, with appropriate Chemistry and Biochemistry subjects in addition to an introduction to Genetics and Cell Biology. You will also select from a set of optional modules, to the value of 30 credits, which provides the option to include Introductory Animal Physiology and Introduction to Human Physiology or a module on the Green Planet: Plants and Our Future. Stage one includes a strong element of laboratory training, with practical work in all modules, as well as providing support with the skills necessary for the study of biological sciences. In **Stage two** you take 75 credits in more advanced Biochemistry and Molecular Biology modules building on the foundations laid in the first year and providing a basis for the study of the research led specialist options in Stage three. Again, the modules all include a substantial element of laboratory training that prepares you for the selection and implementation of the individual research project in Stage four. There are 45 credits of optional modules, allowing you to concentrate on biochemistry or to diversify into other areas depending on your interests. In **Stage three** you spend a year in a relevant placement setting, to gain valuable experience in the workplace. The assessment from this year in industry counts as 30 credits which, for the purposes of award classification, is counted in the final stage. **Stage four** allows for increasing specialisation, with the major focus being on areas of the subject relevant to Biochemistry. In addition to the individual research project and two 15 credit mandatory modules, you will select your remaining modules (to the value of 60 credits) from a list of options, thus allowing you to select from modules that reflect the research interests of internal and external staff, who are specialists in their field. The final year project is regarded as your graduate capstone experience, as it is the culmination of your training in experimental design, research techniques, data analysis and presentation. The Biochemistry course has the flexibility to allow you to select between topics with relevance from medical research to plant growth, including the applied aspects of biochemistry in biotechnology.

The course provides a comprehensive treatment of modern animal, plant and microbial biochemistry, including molecular biology and chemistry pertinent to the Biosciences. The course involves training in a variety of practical techniques and skills relevant to research in biochemistry. The system is also flexible and allows you to transfer to other degree streams within the Department up to the start of the second term, or indeed to other Molecular Bioscience degrees up to the start of the second year. You can also take up to 30 credits from outside the Department of Biological Sciences, but within other Science Departments, during stage two or four. Options are selected in consultation with your Personal Tutor and the Director of Teaching/Department Lead in UG Education.

While Royal Holloway keeps all the information made available under review, courses and the availability of individual modules, especially optional modules are necessarily subject to change at any time, and you are therefore advised to seek confirmation of any factors which might affect your decision to follow a specific course. In turn, Royal Holloway will inform you as soon as is practicable of any significant changes which might affect your studies.

The following is a brief description for some of the most important terminology for understanding the content of this document:

*Degree course* – May also be referred to as ‘degree programme’ or simply ‘programme’, these terms refer to the qualification you will be awarded upon successful completion of your studies.

*Module* – May also be referred to as ‘course’, this refers to the individual units you will study each year to complete your degree course. Undergraduate degrees at Royal Holloway comprise a combination of modules in multiples of 15 credits to the value of 120 credits per year. On some degree courses a certain number of optional modules must be passed for a particular degree title.

Section 2 – Course details			
Date of specification update	November 2023	Location of study	Egham Campus
Course award and title	BSc Biochemistry with a Year in Industry	Level of study	Undergraduate
Course code	3481	UCAS code	C702
Year of entry	2024/25		
Awarding body	Royal Holloway, University of London		
Department or school	Department of Biological Sciences School of Life Sciences and the Environment	Other departments or schools involved in teaching the course	N/A
Mode(s) of attendance	Full-time	Duration of the course	Four years
Accrediting Professional, Statutory or Regulatory Body requirement(s)	You must pass the BS3010 Individual Research Project in order to qualify for an Honours Degree in Biochemistry; this is a requirement of the Royal Society of Biology for an accredited degree.		
Link to Coursefinder for further information:	<a href="https://www.royalholloway.ac.uk/studying-here/">https://www.royalholloway.ac.uk/studying-here/</a>	For queries on admissions:	<a href="https://royalholloway.ac.uk/applicationquery">https://royalholloway.ac.uk/applicationquery</a>

Section 3 – Degree course structure					
3.1 Mandatory module information					
The following table summarises the mandatory modules which students must take in each year of study					
Year	Module code	Module title	Credits	FHEQ level	Module status (Mandatory Condonable MC or Mandatory Non-Condonable MNC)
1	BS1021	Becoming a Bioscientist	15	4	MC
1	BS1031	Chemistry of Life	15	4	MC
1	BS1032	Fundamental Biochemistry	15	4	MC
1	BS1071	Cell Biology and the Origin of Life	15	4	MC
1	BS1072	Genetics	15	4	MC
1	BS1091	Protein Biochemistry and Enzymology	15	4	MC
2	BS2510	Bioenergetics and Metabolism	15	5	MC
2	BS2520	Protein Structure and Function	15	5	MC
2	BS2530	Molecular Biology	15	5	MC
2	BS2570	Physical Biochemistry for Life Scientists	15	5	MC
2	BS2580	Natural Product Biochemistry and Sustainability	15	5	MC
3	BS3900	Year in Industry	30	6	MNC
4	BS3010	Individual Research Project	30	6	MNC
4	BS3560	Functional Genomics, Proteomics and Bioinformatics	15	6	MC
4	BS3420	Nutrition and Medical Biochemistry	15	6	MC

This table sets out the most important information for the mandatory modules on your degree course. These modules are central to achieving your learning outcomes, so they are compulsory, and all students on your degree course will be required to take them. You will be automatically registered for these modules each year. Mandatory modules fall into two categories: 'condonable' or 'non-condonable'.

In the case of mandatory 'non-condonable' (MNC) modules, you must pass the module before you can proceed to the next year of your course, or to successfully graduate with a particular degree title. In the case of mandatory 'condonable' (MC) modules, these must be taken but you can still progress or graduate even if you do not pass them. Please note that although Royal Holloway will keep changes to a minimum, changes to your degree course may be made where reasonable and necessary due to unexpected events. For example: where requirements of relevant Professional, Statutory or Regulatory Bodies have changed and course requirements must change accordingly, or where changes are deemed necessary on the basis of student feedback and/or the advice of external advisors, to enhance academic provision.

### 3.2 Optional modules

In addition to mandatory modules, there will be a number of optional modules available during the course of your degree. Although Royal Holloway will keep changes to a minimum, new options may be offered or existing ones may be withdrawn. For example where reasonable and necessary due to unexpected events, where requirements of relevant Professional, Statutory or Regulatory Bodies (PSRBs) have changed and course requirements must change accordingly, or where changes are deemed necessary on the basis of student feedback and/or the advice of External Advisors, to enhance academic provision. There may be additional requirements around option selection; please contact the Department for further information.

During stage one, you must choose options equal to the value of 30 credits from a list of stage one modules offered by the Department.

During stage two, you must choose options equal to the value of 45 credits from a list of stage two modules offered by the Department.

During stage four, you must choose options equal to the value of 60 credits from a list of FHEQ level 6 modules offered by the Department.

## Section 4 - Progressing through each year of your degree course

For further information on the progression and award requirements for your degree, please refer to Royal Holloway's [Academic Regulations](#).

Progression throughout the year/s is monitored through performance in summative or formative coursework assignments. Please note that if you hold a Student Visa and you choose to leave (or are required to leave because of non-progression) or complete early (before the course end date stated on your CAS), then this will be reported to UKVI.

All first year undergraduate students are required to take and pass the non-credit bearing Moodle-based Academic Integrity module SS1001 in order to progress into the second year of study (unless their course includes the alternative mandatory SS1000 module). The pass mark for the module assessment is stated in the on-line Academic Integrity Moodle module. Students may attempt the assessment as often as they wish with no penalties or capping. Students who meet the requirements for progression as stipulated in the College's

Undergraduate Regulations (Section: Conditions for progression to the next stage) but fail to pass the Moodle-based Academic Integrity module will not be permitted to progress into their second year of academic study at the College

### **Year in Industry**

Students taking an industrial year take additional module BS3900 and thus have 150 credits in their final year.

Students on degree courses with Year in Industry need to fulfil the requirements set out in the departmental Year in Industry Handbook in order to progress to the placement and be eligible for the degree title.

### **Section 5 – Educational aims of the course**

The aims of the Honours Degree course in Biochemistry with a Year in Industry are to:

- provide a sound knowledge and understanding of the molecular, cellular, and chemical principles of the subject through a core set of modules, and develop an insight into the current frontiers of knowledge, primarily through a series of stage two and more particularly specialised stage four module options which focus on selected areas of topical importance in biochemistry;
- develop, through a flexible and progressive structure, a range of subject-specific and transferable skills, including practical laboratory skills, self-management, information retrieval, communication and presentation skills, working with others, decision making and meeting deadlines, that equip you for future employment;
- provide professional experience in a relevant workplace environment;
- provide experience of independent research through a final year project;
- produce graduates who can work safely and responsibly with biological and chemical materials and laboratory equipment.

## Section 6 - Course learning outcomes

In general terms, the courses provide opportunities for students to develop and demonstrate the following learning outcomes. (*Categories – Knowledge and understanding (K), Skills and other attributes (S), and Transferable skills (\*)*)

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| <ol style="list-style-type: none"> <li>1. describe the chemistry that underlies biochemical reactions and techniques used to investigate them <b>(K)</b>;</li> <li>2. explain what determines the 3D-structure of biological macromolecules and how structure enables function, as well as the chemical and thermodynamic principles underlying biological catalysis and the role of enzymes and other proteins in determining function and fate of cells and organisms <b>(K)</b>;</li> <li>3. identify the molecular basis of genetics and gene regulation and be able to explain how genetics underlies modern molecular biology <b>(K)</b>;</li> <li>4. describe the structure and function of sub-cellular structures and cell types in unicellular and multi-cellular organisms, including cell differentiation, how cell properties suit them for their biological function, and how they are investigated experimentally <b>(K)</b>;</li> <li>5. elaborate on key topics in cell metabolism, including cell-cycle control, and topics such as energy and signal transduction, respiration and photosynthesis, along with appropriate experimental techniques <b>(K)</b>;</li> <li>6. explain biological phenomena at a variety of levels (from molecular to ecological), relevant evolutionary theory, and the molecular, cellular, physiological and chemical principles that underlie the subject <b>(K)</b>;</li> <li>7. engage with philosophical and ethical issues arising from some of the current developments in the biosciences and their impact on society, and explain how ethical issues underpin professional integrity and standards <b>(K)</b>;</li> <li>8. demonstrate an appreciation for the relevance of biochemistry and the importance of the scientific (research) approach in employment settings and organisations, and understand the professional standards expected in the workplace <b>(K)</b>;</li> <li>9. demonstrate competence in a range of practical techniques and skills in relevant areas of the biosciences, applying standard safety protocols and Good Laboratory Practice <b>(S)</b>;</li> <li>10. perform accurate data collection, analysis and interpretation including relevant numerical calculations, statistical analysis, testing of hypotheses, and show ability</li> </ol> | <ol style="list-style-type: none"> <li>11. apply well-developed strategies for accessing information from a wide range of sources in order to maintain, update and enhance knowledge of the Biosciences, including cutting-edge developments in the field and cross-disciplinary awareness, and sort, filter, synthesise and abstract information to communicate the principles clearly in oral and written forms in a way that is organised and topical, and recognises the limits of current hypotheses <b>(K, S*)</b>;</li> <li>12. critically assess the merits of contrasting subject-specific theories, paradigms, concepts and principles and develop a reasoned argument to support your position <b>(S)</b>;</li> <li>13. plan, design, execute and present an independent piece of research through a theoretical or practical project relevant to biochemistry, demonstrating time management, initiative, problem solving and independence, and critically assess the quality of evidence <b>(S*)</b>;</li> <li>14. take personal responsibility for your own behaviour to benefit learning and wellbeing, and develop habits of reflection on that learning <b>(S*)</b>; <b>(S*)</b>;</li> <li>15. creatively apply original ideas, using imaginative and/or innovative approaches to tackle problems <b>(S*)</b>;</li> <li>16. write and speak effectively to communicate science to peers and non-scientists <b>(S*)</b>;</li> <li>17. use information technology, including spreadsheets, databases and bioinformatics approaches in the analysis of large datasets <b>(S*)</b>;</li> <li>18. demonstrate interpersonal skills and social intelligence, including collaborating with others in groups, taking opportunities for leadership, and recognising and respecting the views of others <b>(S*)</b>;</li> <li>19. prepare for your career and develop awareness of graduate-level transferable skills <b>(S*)</b>.</li> <li>20. demonstrate the key skills for successful employment to a professional standard in industry or other organisations, including good time management, team working, record keeping, showing appreciation of health and safety issues, and showing leadership or management potential <b>(S*)</b>.</li> </ol> |
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to place the work in context, analyse and solve problems, make decisions, and suggest lines of further study (S\*);

### Section 7 - Teaching, learning and assessment

The overall strategy is to provide a progressive approach to biochemical concepts and systems of increasing complexity through teaching methods that aid learning and stimulate interest. Teaching is mostly by means of lectures, laboratory classes, seminars, tutorials and study/revision sessions, with knowledge and understanding further developed by guided independent study. Learning and analytical ability are developed and reinforced through problem solving, essay writing, laboratory classes, critical evaluation and by giving students the opportunity to design, execute and evaluate their own experiments. You are encouraged to acquire further knowledge beyond taught material, e.g. by reading topical reviews, original research literature and attending research seminars, especially in the final year. The practical assignments associated with first year and second year modules provide training in a range of subject specific laboratory techniques, including safety assessment. The culmination of these skills is demonstrated in the final year research project, and for literature skills the preparation of a literature report. You have to prepare your own risk assessment prior to commencing your final year project work.

Training in intellectual and key transferable skills is embodied throughout the course and forms a strong element of the tutorial and study session courses. You are required to meet basic standards in information technology.

Assessment is typically by formal unseen written examinations, practical exams and a range of coursework assignments such as essays, laboratory reports, poster preparation, oral presentations and the individual research project. Full details of the assessments for individual modules can be obtained from the Department.

Contact hours come in various forms and may take the form of time spent with a member of staff in a lecture or seminar with other students. Contact hours may also be laboratory or, studio-based sessions, project supervision with a member of staff, or discussion through a virtual learning environment (VLE). These contact hours may be with a lecturer or teaching assistant, but they may also be with a technician, or specialist support staff.

The way in which each module on your degree course is assessed will also vary, however, the assessments listed above are all 'summative', which means you will receive a mark for it which will count towards your overall mark for the module, and potentially your degree classification, depending on your year of study. On successful completion of the module you will gain the credits listed. 'Coursework' might typically include a written assignment, like an essay. Coursework might also include a report, dissertation or portfolio. 'Practical assessments' might include an oral assessment or presentation, or a demonstration of practical skills required for the particular module

More detailed information on modules, including teaching and learning methods, and methods of assessment, can be found via the online [Module Catalogue](#). The accuracy of the information contained in this document is reviewed regularly by the university, and may also be checked routinely by external agencies, such as the Quality Assurance Agency (QAA).

<b>Section 8 – Additional costs</b>	
There are no single associated costs greater than £50 per item on years 1, 2 and 4 of this degree course, however, costs incurred by students while on a Year in Industry/Business (year 3) vary depending on the nature and location of the placement. For further information please contact the <a href="#">Student Services Centre</a> .	
These estimated costs relate to studying this particular degree course at Royal Holloway. General costs such as accommodation, food, books and other learning materials and printing etc., have not been included, but further information is available on our website.	

<b>Section 9 – Indicators of quality and standards</b>	
<b>QAA Framework for Higher Education Qualifications (FHEQ) Level</b>	4-6
Your course is designed in accordance with the FHEQ to ensure your qualification is awarded on the basis of nationally established standards of achievement, for both outcomes and attainment. The qualification descriptors within the FHEQ set out the generic outcomes and attributes expected for the award of individual qualifications. The qualification descriptors contained in the FHEQ exemplify the outcomes and attributes expected of learning that results in the award of higher education qualifications. These outcomes represent the integration of various learning experiences resulting from designated and coherent courses of study.	
<b>QAA Subject benchmark statement(s)</b>	<a href="http://www.qaa.ac.uk/quality-code/subject-benchmark-statements">http://www.qaa.ac.uk/quality-code/subject-benchmark-statements</a>
Subject benchmark statements provide a means for the academic community to describe the nature and characteristics of courses in a specific subject or subject area. They also represent general expectations about standards for the award of qualifications at a given level in terms of the attributes and capabilities that those possessing qualifications should have demonstrated.	

<b>Section 10– Intermediate exit awards (where available)</b>		
You may be eligible for an intermediate exit award if you complete part of the course as detailed in this document. Any additional criteria (e.g. mandatory modules, credit requirements) for intermediate awards is outlined in the sections below.		
<b>Award</b>	<b>Criteria</b>	<b>Awarding body</b>
Diploma in Higher Education (DipHE)	Pass in 210 credits of which at least 90 must be at or above FHEQ Level 4 and at least 120 of which must be at or above FHEQ Level 5	Royal Holloway and Bedford New College



Certificate in Higher Education (CertHE)	Pass in 120 credits of which at least 90 must be at or above FHEQ Level 4	Royal Holloway and Bedford New College
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