

Programme Information		
Programme Title	Programme Code	HECoS Code
Biotechnology with Research Abroad Biotechnology with a Year in Industry/Research	J701 J702	For Registry Use Only

Award	Length of Study	Mode of Study	Entry Point(s)	Total Credits	
				ECTS	CATS
BSc	4 Years	Full-time	October	240	480
Dip HE	N/A	N/A	N/A	120	240
Cert HE	N/A	N/A	N/A	60	120

The Cert. HE / Dip. HE are exit awards and are not available for entry. All students must apply to and join the BSc

Ownership			
Awarding Institution	Imperial College London	Faculty	Natural Sciences
Teaching Institution	Imperial College London	Department	Life Sciences
Associateship	Associateship of the Royal College of Science (ARCS)	Main Location(s) of Study	South Kensington

External Reference	
Relevant QAA Benchmark Statement(s) and/or other external reference points	Biosciences
FHEQ Level	Level 6
EHEA Level	1 st cycle

External Accreditor(s) (if applicable)			
External Accreditor 1:	None		
Accreditation received:	N/A	Accreditation renewal:	N/A

Collaborative Provision			
Collaborative partner	Collaboration type	Agreement effective date	Agreement expiry date
N/A	N/A	N/A	N/A

Specification Details	
Programme Lead	Prof Huw Williams
Student cohorts covered by specification	2023-24 entry
Date of introduction of programme	October 2019
Date of specification revision	April 2023

Programme Overview
<p>The Biotechnology with a Year in Industry/Research and Biotechnology with Research Abroad programmes allow students the opportunity to gain experience within commercial companies or research organisations.</p> <p>Studying the Biotechnology BSci programme you will be actively engaged in a curriculum that will be enriched from year 1 onwards by the Department of Life Sciences' research environment. You will study the fundamental chemical processes occurring in living organisms and how the structure and chemical properties of molecules relate to their cellular function. You will learn to use chemical knowledge and methodologies to understand and solve biological problems and how this can be applied to solve real world biotechnology problems. You will investigate the properties of the molecules that build living cells, such as proteins, carbohydrates and nucleic acids as well as the function of organelles and the ways in which cells communicate with one another and how an understanding of these biological processes can be exploited to make industrially useful products or provide solutions to healthcare-related problems.</p> <p>All students on Biotechnology programmes follow the same core modules in the first two years of study, where the programme will range from biological chemistry to cell biology and molecular biology. This will be complemented by a Life Science Skills programme that will provide training in quantitative skills, programming, statistics and scientific writing and presentation. You will develop a synoptic understanding of Biotechnology and Biochemistry before starting to specialise towards the end of year 2 by taking a biotechnological elective module.</p> <p>For BSc Biotechnology with a Year in Industry/Research, the third year will be spent carrying out research in an industrial, medical or other biochemical work environment.</p> <p>For BSc Biotechnology with Research Abroad, the third year will be spent carrying out research in an industrial, medical or other appropriate biochemical/biotechnological work environment overseas. Links with various universities in the EU have been established for the overseas scientific and cultural component of the Year in Europe/Research Abroad degrees.</p> <p>You will specialise in the final year by selecting modules from our programme with biotechnological content leading to specialised training in Biotechnological aspects of Biochemistry. Modules may include specialisations in areas including Drug Design, Synthetic Biology, Systems Biology, Metabolic Engineering and Glycobiology. Our final year specialised modules are based around our wide-ranging, world class research expertise and you will be brought to the edge of knowledge in your chosen specialised modules, taught by experts.</p> <p>Through laboratory and computational work, you will learn the skills you need to design, carry out and analyse the data from biochemical experiments</p> <p>You will have the opportunity to contribute to the department's research by undertaking a 10 week, full time research project.</p> <p>You will learn from the full range of academic staff in the department, including world leaders, as well as postgraduate students, your peers and visiting scientists to the department.</p>

A high proportion of Graduates in Biotechnology go onto further study including PhD study or enter a range of employments including, research and development in pharma, biotech, science policy, research and technical consultancy, business and finance.

Learning Outcomes

Please refer to the Teaching Toolkit for advice on the role and purpose of Intended Learning Outcomes (ILO): www.imperial.ac.uk/staff/educational-development/teaching-toolkit/intended-learning-outcomes

On completion of this programme, graduates will be able to:

On achieving the Cert HE:

1. Interpret and apply core terminology and key concepts used in life sciences;
2. Integrate fundamental biological and/or biochemical principles to explore biological complexity;
3. Integrate concepts from a range of disciplines, including physics, chemistry and maths, to solve problems in life sciences;
4. Demonstrate effective verbal, written communication and presentation skills;

On achieving the Dip HE, the ILOs (1-4) above and

5. Explore ethical and social issues in life sciences, and consider the potential impact of novel technologies;
6. Formulate hypotheses, design experiments, and apply lab and/or field skills to collect and critically evaluate relevant data;
7. Conduct statistical analyses using programming skills, adhering to publication standards;
8. Collaborate successfully in diverse, multicultural and international teams;

On achieving the BSc, all the ILOs (1-8) above and

9. Demonstrate excellent verbal, written communication and presentation skills across a range of academic and disciplinary activities, including research, assessment, dissemination and communication with diverse audiences;
10. Solve complex real-world problems within their degree specialisation, using a range of appropriate laboratory, computational or field skills;
11. Create independent, enquiry-based, extended and novel work that demonstrates critical analysis and evaluation.
12. Demonstrate an awareness of the outstanding research problems of their chosen Life Science specialities through exploring topics in the final year, research-led modules and be able to evaluate and understand how they are being or can be tackled.
13. Display a strong sense of personal and professional identity as a life scientist, and feel confident to apply the scientific method to real-world life science problems;

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial College degree programme. The Graduate Attributes are available at: www.imperial.ac.uk/students/academic-support/graduate-attributes

Entry Requirements

Academic Requirement	<u>A level</u> AAA overall, to include: A in Chemistry A in Biology, Mathematics or Physics
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	<p>A in another subject</p> <p>General Studies and Critical Thinking are not accepted.</p> <p><u>International Baccalaureate (IB)</u></p> <p>Minimum 38 overall 6 in Chemistry at higher level 6 in Biology, Physics or Mathematics at higher level</p>
Non-academic Requirements	None
English Language Requirement	<p>Higher requirement Please check for other Accepted English Qualifications</p>
Admissions Test/Interview	There is no admissions test associated with entry to this programme and applicants will not normally be interviewed.
The programme's competency standards documents are available from the department.	
Learning and Teaching Approach	
<p>Learning and Teaching Delivery Methods Lectures and large group-teaching incorporating a range of active learning approaches, laboratory practicals working as individuals, in pairs or small groups, computational work, seminars, tutorials and problem classes, interactive online learning material, online concepts and skills videos and interactive group work, student presentations as individuals and small groups, team-based learning, dissertation and individual research projects.</p> <p>Overall Workload Your overall workload consists of face-to-face sessions and independent learning. While your actual contact hours may vary according to the optional modules you choose to study, the following gives an indication of how much time you will need to allocate to different activities at each level of the programme. At Imperial, each ECTS credit taken equates to an expected total study time of 25 hours. Therefore, the expected total study time is 1500 hours per year.</p> <p>Typically in the first two years you will spend in the order of 30% of your time on lectures, laboratory work and small group teaching and seminars and similar (around 400 hours) and in the order of 70% of your time on independent study.</p>	
Assessment Strategy	
Assessment Methods	
<p>Formative assessment. Performance in problem classes, quizzes in lectures, digital resources for self-assessment including online quizzes and problems, by discussions in tutorials as well as written and or verbal feedback on a range of non-examined tasks, including the types of summatively assessed tasks listed below.</p> <p><u>Summative Assessment</u> Written Examinations Laboratory write-ups Essays Reports Dissertations Presentations Individual research project report Viva voce examination Peer assessment Poster presentations</p>	

Assessment Mode	Year 1	Year 2	Year 3	Year 4
Examination	60	48	0	56
Coursework	40	52	0	44

Academic Feedback Policy

Coursework submission is managed by our education office and in most cases coursework is submitted electronically via BlackBoard and feedback is provided electronically or by a feedback form attached to items of coursework. Feedback is also provided via Blackboard on formative quizzes. You will receive feedback normally within 10 working days, but this might be longer for some very substantial pieces of work, such as a dissertation. Personal tutors hold timetabled tutorials to give feedback on examination performance and can be approached by their tutees at any point in the year for further guidance. The education office manages the timely return of coursework feedback and the Director of Undergraduate Studies routinely monitors the quality and quantity of feedback provided. In some instances, generic class feedback is returned to all students via email or a Blackboard announcement once coursework is marked.

Re-sit Policy

The College's Policy on Re-sits is available at: www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/

Mitigating Circumstances Policy

The College's Policy on Mitigating Circumstances is available at: www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/

Additional Programme Costs

This section should outline any additional costs relevant to this programme which are not included in students' tuition fees.

Description	Mandatory/Optional	Approximate cost
N/A	N/A	N/A

Programme Structure					
Year 1 – FHEQ Level 4 Students study all core modules.					
Code	Module Title	Core/ Elective	Group*	Term	Credits
LIFE40001	Biological Chemistry	Core		Autumn- Summer	15
LIFE40002	Cell Biology	Core		Autumn- Summer	15
LIFE40003	Enzymes and Metabolism	Core		Spring- Summer	15
LIFE40004	Molecular Biology	Core		Spring- Summer	15
Credit Total					60
Year 2 - FHEQ Level 5 Students study all core modules and one elective module from Group A.					
Code	Module Title	Core/ Compulsory/ Elective	Group	Term	Credits
LIFE50022	Structural Biology	Core		Autumn	10
LIFE50010	Genes and Genomics	Core		Autumn	7.5
LIFE50026	Bioinformatics, Statistics and Programming (Biochemistry)	Core		Autumn- Spring	5
LIFE50003	Tutored Dissertation	Core		Summer	7.5
LIFE50019	Protein Science	Core		Spring	7.5
LIFE50013	Integrative Cell Biology	Core		Spring	10
LIFE50023	Topics in Biotechnology	Core		Summer	7.5
	I-Explore	Compulsory		Autumn- Spring	5/7.5
Credit Total					60/62.5
Year 3 - FHEQ Level 6 Students study all core modules.					
Code	Module Title	Core/ Elective	Group	Term	Credits
LIFE60035 LIFE60036	Year Abroad (C702 only) OR Year in Industry/Research (C701 only)	Core		Autumn- Summer	60
Credit Total					60

Year 4 - FHEQ Level 6

All year 4 modules are electives and students will select three electives for study, one from each of Groups A, B and C and a research project option from Group D. Elective modules in Groups A, B and C are capped normally at 40-45 students/module and students choose their top three choices from each group with final allocations being made by an algorithm that maximises the allocation of highest number of top choices across the cohort. Points are allocated to modules with a strong Biotechnology element that are appropriate for Biotechnology students and students have to select modules to give them a minimum of 8 Biotechnology points.

Code	Module Title	Core/ Elective	Group	Term	Credits
LIFE60061	Stem Cells, Regeneration and Ageing	Elective	A	Autumn	15
LIFE60056	Metabolic and Network Engineering	Elective	A	Autumn	15
LIFE60055	Medical Microbiology	Elective	A	Autumn	15
LIFE60057	Plant Biotechnology and Development	Elective	A	Spring	15
LIFE60059	Current Topics in Developmental Biology	Elective	A	Autumn	15
LIFE60062	Structural Biology and Drug Design	Elective	A	Autumn	15
LIFE60050	Evolutionary Applications	Elective	B	Autumn	15
LIFE60067	Bacterial Molecular Machines	Elective	B	Autumn	15
LIFE60052	Integrative Systems Biology	Elective	B	Autumn	15
LIFE60043	Advanced Topics in Parasitology and Vector Biology	Elective	B	Autumn	15
LIFE60063	Symbiosis, Plant Immunity and Disease	Elective	B	Autumn	15
LIFE60042	Advanced Topics in Immunity and Infection	Elective	A	Autumn	15
LIFE60065	The Microbiome	Elective	C	Spring	15
LIFE60048	Cancer	Elective	B	Autumn	15
LIFE60053	Mechanisms of Gene Expression	Elective	A	Autumn	15
LIFE60058	Molecular Basis of Bacterial Infection	Elective	C	Spring-Summer	15
LIFE60047	Bioinformatics	Elective	C	Spring	15
LIFE60060	Synthetic Biology	Elective	C	Spring	15
LIFE60064	Systems Neuroscience	Elective	C	Spring-Summer	15
LIFE60046	Biodiversity Genomics	Elective	C	Autumn	15
LIFE60041	Advanced Immunology	Elective	C	Spring	15
LIFE60054	Medical Glycobiology	Elective	C	Spring	15
LIFE60049	Disease Ecology and Epidemiology	Elective	B	Autumn	15

LIFE60040	Science Communications plus Dissertation	Elective	D	Spring-Summer	15
LIFE60066	Research Project (Lab, Data, Field)	Elective	D	Spring-Summer	22.5
Credit Total					60

* 'Group' refers to module grouping (e.g. a group of electives from which one/two module(s) must be chosen).

Progression and Classification

Progression

In order to progress to the next level of study, you must have passed all modules (equivalent to 60 ECTS) in the current level of study at first attempt, at resit or by a compensated pass.

The overall weighted average for each year must be 40%, including where a module(s) has been compensated, in order for you to progress to the next year of the programme.

Classification

The marks from modules in each year contribute towards the final degree classification.

In order to be considered for an award, you must have achieved the minimum number of credits at the required levels prescribed for that award and met any programme specific requirements as set out in the Programme Specification.

Your classification will be determined through:

- i) Aggregate Module marks for all modules
- ii) Year Weightings

For this award, Year One is weighted at 7.5%, Year Two at 35% and Year Three at 0% and Year Four at 57.5%.

The College sets the class of undergraduate degree that may be awarded as follows:

- i) First 70% or above for the average weighted module results
- ii) Upper Second 60% or above for the average weighted module results
- iii) Lower Second 50% or above for the average weighted module results
- iv) Third 40% or above for the average weighted module results

Programme Specific Regulations

N/A

Supporting Information

The Programme Handbook is available from the department.

The Module Handbook is available from the department.

The College's entry requirements for postgraduate programmes can be found at:
www.imperial.ac.uk/study/pg/apply/requirements

The College's Quality and Enhancement Framework is available at:
www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance

The College's Academic and Examination Regulations can be found at:
www.imperial.ac.uk/about/governance/academic-governance/regulations

Imperial College is an independent corporation whose legal status derives from a Royal Charter granted under Letters Patent in 1907. In 2007 a Supplemental Charter and Statutes was granted by HM Queen Elizabeth II. This Supplemental Charter, which came into force on the date of the College's Centenary, 8th July 2007, established the College as a University with the name and style of "The Imperial College of Science, Technology and Medicine".
www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/

Imperial College London is regulated by the Office for Students (OfS)
www.officeforstudents.org.uk/advice-and-guidance/the-register/

This document provides a definitive record of the main features of the programme and the learning outcomes that a typical student may reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities provided. This programme specification is primarily intended as a reference point for prospective and current students, academic and support staff involved in delivering the programme and enabling student development and achievement, for its assessment by internal and external examiners, and in subsequent monitoring and review.

Modifications

Description	Approved	Date	Paper Reference
N/A	N/A	N/A	N/A