

BSc Biochemistry with a Year in Industry/Research
BSc Biochemistry with Research Abroad

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 intended as a reference point for prospective students, current students, external examiners and academic and support staff involved in delivering the programme and enabling student development and achievement.

Programme Information			
Programme Title	Biochemistry with a Year in Industry/Research; Biochemistry with Research Abroad		
Programme Code	C701; C702		
Award(s)	BSc		
Associateship	Royal College of Science (ARCS)		
Awarding Institution	Imperial College London		
Teaching Institution	Imperial College London		
Faculty	Faculty of Natural Sciences		
Department	Department of Life Sciences		
Main Location of Study	South Kensington Campus		
Mode and Period of Study	4 academic years full-time		
Cohort Entry Points	Annually in October		
Relevant QAA Benchmark Statement(s) and/or other external reference points	Biosciences		
Total Credits	ECTS:	240	CATS: 480
FHEQ Level	Level 6		
EHEA Level	1 st cycle		
External Accrator(s)	None		
Specification Details			
Student cohorts covered by specification	2017/18 entry		
Person responsible for the specification	Dr Huw Williams		
Date of introduction of programme			

Date of programme specification/revision	August 2017
Programme Overview	
<p>The Biochemistry with a Year in Industry/Research and Biochemistry with Research Abroad programmes allow students the opportunity to gain experience within commercial companies or research organisations.</p> <p>In the first two years students will tackle core subjects to ensure that they receive a solid grounding in fundamentals.</p> <p>For BSc Biochemistry 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 Biochemistry 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>Students will then specialise in the final year, making their choice from a wide range of options and research projects.</p> <p>Our biochemistry and biotechnology courses contain topics covering all aspects of the applied biochemistry and the biotechnology industry, such as intellectual property and patents, commercialising technology, and entrepreneurship, with lectures and case studies from biotechnology business leaders and academics.</p>	
Learning Outcomes	
<p>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</p>	
<p>Knowledge and Understanding of:</p> <ul style="list-style-type: none"> • Biological chemistry; molecular biology and genetics; cell biology; protein and enzyme structure and function; (Year 1) • Genes and genomics; macromolecular structure and function; integrative cell biology; (Year 2) • Advanced knowledge and understanding of three specialist modules; (Year 3) <p>Intellectual Skills (thinking) skills - able to:</p> <ul style="list-style-type: none"> • Analyse and solve biochemistry-based problems; • Integrate and evaluate information; • Formulate and test hypotheses using appropriate experimental design and statistical analysis of data; • Plan, conduct and write-up a programme of original research <p>Practical skills – able to:</p> <ul style="list-style-type: none"> • Plan and execute safely a series of experiments; 	

- Use laboratory methods to generate data;
- Analyse experimental results and determine their strength and validity;
- Prepare technical reports;
- Give technical presentations;
- Use the scientific literature effectively;
- Use computational tools and packages.

Transferable skills – able to:

- Communicate effectively through oral presentations, computer processing and presentations, and written reports;
- Work independently and as part of a team
- Integrate and evaluate information from a variety of sources;
- Use Information and Communications Technology;
- Manage resources and time;
- Learn independently with open-mindedness and critical enquiry;
- Learn effectively for the purpose of continuing professional development.

Entry Requirements

Academic Requirement	Grade Requirement	Normally a minimum AAA overall
	Subject Requirements	A in Chemistry A in another science subject (Biology is preferred but not mandatory) or Mathematics (or a comparable qualification recognised by the College)
	Excluded Subjects	Key Skills Critical Thinking General Studies
International Baccalaureate (IB)	Grade Requirement	Minimum 38 overall
	Subject Requirements	6 in Chemistry at higher level 6 in Biology or Mathematics at higher level (or a comparable qualification recognised by the College)
GCSE Requirements		B in Mathematics, Chemistry and Biology (or Combined Sciences)
English Language Requirement		Higher requirement IELTS score of 7.0 overall (minimum 6.5 in all elements)
Admissions Tests		None
Interview		No

The programme's competency standards documents can be found at:
<http://www.imperial.ac.uk/students/academic-support/graduate-attributes/>

Learning & Teaching Strategy

Scheduled Learning & Teaching Methods	<ul style="list-style-type: none"> • Laboratory • Lectures • Tutorials • Seminars
E-learning & Blended Learning Methods	<ul style="list-style-type: none"> • Computer-based work
Project and Placement Learning Methods	<ul style="list-style-type: none"> • Group project • Research project/dissertation • Site visits

Assessment Strategy

Assessment Methods	<ul style="list-style-type: none"> • Written Examinations • Coursework • Laboratory write-ups • Essays • Reports • Dissertations • Presentations • Individual research project report • Viva
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Academic Feedback Policy

Coursework feedback is provided by a feedback form attached to items of coursework. Feedback is also provided via Blackboard on automatically-assessed pieces of coursework and on formative MCQ quizzes. Personal tutors hold timetabled tutorials at the start of the academic year to give feedback on examination performance and can be approached by their tutees at any point in the year for further guidance. The undergraduate teaching office repeatedly informs individual staff via email when coursework is due back at the appropriate time. The Director of Undergraduate Studies routinely monitors the quality and quantity of feedback provided on marked coursework. 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: <http://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: <http://www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/>

Programme Structure					
Year One	Pre-session	Term One	Term Two	Term Three	Term Four
Core Modules	0	2	2		0
Elective Modules	0	0	0	0	0
Projects	0	0	0	0	0
Year Two	Pre-session	Term One	Term Two	Term Three	Term Four
Core Modules	0	2	2	0	0
Elective Modules	0	0	0	1	0
Projects	0	0	1	0	0
Year Three	Pre-session	Term One	Term Two	Term Three	Term Four
Core Modules	Year In Industry/ Research/ Abroad				
Elective Modules					
Projects					
Year Four	Pre-session	Term One	Term Two	Term Three	Term Four
Core Modules	0	0	0	0	0
Elective Modules	0	2	1	0	0
Projects	0	0	1		
Assessment Dates & Deadlines					
Year One					
Written Examinations		January and June			
Coursework Assessments		Continuous			
Project Deadlines		N/A			
Practical Assessments		Continuous			
Year Two					
Written Examinations		January and June			

Coursework Assessments	Continuous
Project Deadlines	N/A
Practical Assessments	Continuous
Year Three	
Written Examinations	Year In Industry/ Research/ Abroad
Coursework Assessments	
Project Deadlines	
Practical Assessments	
Year Four	
Written Examinations	January and February
Coursework Assessments	Continuous
Project Deadlines	June
Practical Assessments	Continuous

Assessment Structure

Marking Scheme

Regulation of Assessment

Minimum pass mark is 40% overall for each course module, which must include a mark of at least 35% in the coursework component and a mark of at least 35% in the examination.

For course modules that include a written examination, coursework typically contributes 20- 25% of the total marks available.

Assessment details are provided in the Student Handbook.

The final degree mark is calculated from the mean mark achieved in Years 1, 2 and 4.

The year weightings for students admitted in or after October 2013 are 11.1:33.3: 0:55.6, respectively.

The year weightings for students admitted before October 2013 are 5:35:0:60.

To qualify for the award of BSc Honours, students must pass all courses.

Assessment Rules and Degree Classification:

For undergraduate programmes classification of degrees will be according to the following range of marks:

First class 70 - 100%

Second class (upper division) 60 - 69.9%

Second class (lower division) 50 - 59.9%

Third class 40 - 49.9%

Fail 0-39%

Module Weightings			
Year	% Year Weighting	Module	% Module Weighting
Year One	11.1%	Molecular Biology	25%
		Proteins and Enzymes	25%
		Biological Chemistry	25%
		Cell Biology	25%
Year Two	33.3%	Genes and Genomics	16.6r%
		Integrative Cell Biology	16.6r%
		Fundamentals of Molecular Biochemistry	16.6r%
		Protein Science	16.6r%
		Tutored Dissertation	11.6r%
		<i>One module from elective group (A)</i>	10%
		<i>One module from elective group (B)</i>	11.6r%
Year Three	0%	Year in Industry/Research (C701 only) OR Year Abroad (C702 only)	N/A
Year Four	55.6%	<i>EITHER:</i> Laboratory Based Research Project OR Literature Based Dissertation AND Science Communication	35%
		<i>One module from elective group (C)</i>	21.66r%
		<i>One module from elective group (D)</i>	21.66r%
		<i>One module from elective group (E)</i>	21.66r%

Module List

Code	Title	Core/ Elective	Year	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
LS1-MB	Molecular Biology	CORE	1	96	279	0	375	75%	10%	15%	4	15.00
LS1-PE	Proteins and Enzymes	CORE	1	65	310	0	375	75%	13%	12%	4	15.00
LS1-BC	Biological Chemistry	CORE	1	74	301	0	375	75%	5%	20%	4	15.00
LS1-CB	Cell Biology	CORE	1	61	314	0	375	75%	8%	17%	4	15.00
LS2-GG	Genes and Genomics	CORE	2	49	201	0	250	75%	7%	18%	5	10.00
LS2-ICB	Integrative Cell Biology	CORE	2	41	209	0	250	75%	0%	25%	5	10.00
LS2-MSF1	Fundamentals of Molecular Biochemistry	CORE	2	56	194	0	250	75%	14%	11%	5	10.00
LS2-MSF2	Protein Science	CORE	2	52	198	0	250	75%	14%	11%	5	10.00
LS2-TDBC	Tutored Dissertation	CORE	2	4	171	0	175	0%	100%	0%	5	7.00
LS2-TB	Topics in Biotechnology	ELECTIVE (A)	2	44	129	0	175	75%	0%	25%	5	7.00
LS2-CCB	Challenges in Cell Biology	ELECTIVE (A)	2	42	133	0	175	75%	12.5%	12.5%	5	7.00
LS2-AMBC	Applied Molecular Biochemistry	ELECTIVE (A)	2	39	136	0	175	75%	0	25%	5	7.00
N/A	Horizons	ELECTIVE (B)	2	Various			150	Various			6.00	
N/A	Business for Professional Engineers & Scientists	ELECTIVE (B)	2	Various			150	Various			6.00	

Module List

Code	Title	Core/ Elective	Year	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
N/A	Year Abroad	CORE*	3	0	0	1500	1500	0%	100%	0%	6	60.00
N/A	Year in Industry/Research	CORE*	3	0	0	1500	1500	0%	100%	0%	6	60.00
LS3-FYRP	Lab Based Research Project	CORE**	4	360	165	0	525	0%	100%	0%	6	21.00
LS3-FYRD	Literature Based Dissertation	CORE**	4	10	315	0	325	0%	100%	0%	6	13.00
LS3-SCICOMM	Science Communication	CORE**	4	31	169	0	200	0%	100%	0%	6	8.00
LS3-ATPMB	Plant Biotechnology and Development	ELECTIVE (C)	4	56	269	0	325	75%	9%	16%	6	13.00
LS3-DRIBS	Damage and Repair in Biological Systems	ELECTIVE (C)	4	58.5	266.5	0	325	75%	17%	8%	6	13.00
LS3-SBDD	Structural Biology & Drug Design	ELECTIVE (C)	4	73	252	0	325	75%	20%	5%	6	13.00
LS3-MM	Medical Microbiology	ELECTIVE (C)	4	52	273	0	325	75%	5%	20%	6	13.00
LS3-SCRA	Stem Cells, Regeneration and Ageing	ELECTIVE (C)	4	50	275	0	325	75%	0%	25%	6	13.00
LS3-NR	Neuroscience Research	ELECTIVE (C)	4	46	279	0	325	75%	5%	20%	6	13.00
LS3-PDB	Principles of Development	ELECTIVE (C)	4	45	280	0	325	75%	20%	5%	6	13.00
LS3-ATII	Advanced Topics in Immunity and Infection	ELECTIVE (D)	4	57	268	0	325	75%	25%	0%	6	13.00
LS3-MPMI	Symbiosis, Plant Immunity and Disease	ELECTIVE (D)	4	48	277	0	325	75%	17.50%	7.50%	6	13.00

Module List

Code	Title	Core/ Elective	Year	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
LS3-ATPVB	Advanced Topics in Parasitology and Vector Biology	ELECTIVE (D)	4	43.5	281.5	0	325	75%	22%	3%	6	13.00
LS3-ISB	Integrative Systems Biology	ELECTIVE (D)	4	73	252	0	325	75%	5%	20%	6	13.00
LS3-MGE	Mechanisms of Gene Expression	ELECTIVE (D)	4	38	287	0	325	75%	10%	15%	6	13.00
LS3-MNE	Metabolic and Network Engineering	ELECTIVE (C)	4	62	263	0	325	75%	9%	16%	6	13.00
LS3-CANCER	Cancer	ELECTIVE (D)	4	56	269	0	325	75%	5%	20%	6	13.00
LS3-ME	Microbial Ecology	ELECTIVE (D)	4	45	280	0	325	75%	20%	5%	6	13.00
LS3-SB	Synthetic Biology	ELECTIVE (E)	4	52	273	0	325	75%	10%	15%	6	13.00
LS3-BDG	Biodiversity Genomics	ELECTIVE (E)	4	40	285	0	325	75%	10%	15%	6	13.00
LS3-MBBI	Molecular Basis of Bacterial Infection	ELECTIVE (E)	4	53	272	0	325	75%	0%	25%	6	13.00
LS3-BAP	Biotechnology Applications of Proteins	ELECTIVE (E)	4	62	263	0	325	75%	5%	20%	6	13.00
LS3-BIOINF	Bioinformatics	ELECTIVE (E)	4	61	264	0	325	75%	20%	5%	6	13.00
LS3-MG	Medical Glycobiology	ELECTIVE (E)	4	63	262	0	325	75%	16.50%	8.50%	6	13.00
LS3-SN	Systems Neuroscience	ELECTIVE (E)	4	44	281	0	325	75%	12.50%	12.50%	6	13.00
LS3-AI	Advanced Immunology	ELECTIVE (E)	4	54	271	0	325	75%	17.5%	7.5%	6	13.00

*See Y3 table on page 5.

**See Y4 table on page 5.

Supporting Information

The Programme Handbook is available at:

<http://www.imperial.ac.uk/life-sciences/undergraduate/biochemistry-and-biotechnology/>

The Module Handbook is available at:

<http://www.imperial.ac.uk/life-sciences/undergraduate/biochemistry-and-biotechnology/>

The College's entry requirements for undergraduate programmes can be found at:

www.imperial.ac.uk/study/ug/apply/requirements/

The College's Quality & Enhancement Framework is available at:

www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance

The College's Academic and Examination Regulations can be found at:

<http://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".

<http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/>

Imperial College London is regulated by the Higher Education Funding Council for England (HEFCE)

<http://www.hefce.ac.uk/reg/register/>

Modifications

Modification	Committee	Date	Paper
Introduce new elective module LS3-AI (Advanced Immunology)	Programmes Committee	25 October 2016	PC.2016.35
Introduce new elective module LS3-DEE (Disease Ecology and Epidemiology)	Programmes Committee	25 October 2016	PC.2016.35
Introduce new elective module LS3-ME (Microbial Ecology)	Programmes Committee	25 October 2016	PC.2016.35
Introduce new elective module LS3-PDB (Principles of Development)	Programmes Committee	25 October 2016	PC.2016.35
Introduce new elective module LS3-ABECB	Departmental Teaching Committee	5 December 2016	
Macromolecules in 3 Dimensions name changed to Structural Biology & Drug Design	Departmental Teaching Committee	5 December 2016	

Suspend new elective module LS3-DEE (Disease Ecology and Epidemiology)	Departmental Teaching Committee	27 September 2017	
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