Imperial College London

Programme Specification (Undergraduate)

BSc Biotechnology with Management

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				
Award(s)	BSc			
Associateship	Associateship of the Royal College of Science (ARCS)			
Programme Title	Biotechnology with Management			
Programme code	J7N2			
Awarding Institution	Imperial College London			
Teaching Institution	Imperial College London			
Faculty	Faculty of Natural Sciences			
	Imperial College Business School			
Department	Department of Life Sciences			
	Imperial College Business School			
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			
	General Business and Management			
Total Credits	ECTS:	240	CATS:	480
FHEQ Level	Level 6			
EHEA Level	1st cycle			
External Accreditor(s)	AMBA EQUIS AACSB International			

Specification Details	
Student cohorts covered by specification	2016/17 entry
Person responsible for the specification	Professor Anne Dell
	Ms Veronica Russell (Business School)
Date of introduction of programme	
Date of programme specification/revision	October 2015

Description of Programme Contents

The BSc Biotechnology programme is a four-year degree. In the first two years students will tackle core subjects to ensure that they receive a solid grounding in fundamentals.

Students will then specialise in the third year, making their choice from a wide range of options and research projects.

The final year will be spent in the Imperial College Business School. This year aims to prepare students for a career in business management, management services or management consultancy in the private or public sectors in the UK, Europe or worldwide.

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.

Learning Outcomes

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

Knowledge and Understanding of:

- 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)
- The management of innovation in a modern organisation including the implications of technology
- The roles and behaviour of people working in organisations;
- The key issues in contemporary human resource management and an appreciation of the theory and research which underpins these issues;
- The strategic decisions faced by the top management team of an organisation;
- The operations and control of projects, production and service activities;
- The techniques of financial and managerial accounting and their relevance to the broader issues of management decision-making and control;
- A theoretical framework for analysing key financial markets and an understanding of how they interact with the key decisions of firms;

- The business and economic environment including the ways in which the government responds and shapes the economic environment and how this can be anticipated;
- The key marketing concepts and principles of marketing analysis;
- The management problems that are either unique to international business or arise in particular complex or acute forms in business that span national boundaries;
- The issues associated with evaluating the viability of new technologies, new products or services in the fields of medicine and science.

Intellectual Skills (thinking) skills - able to:

- 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;
- Analyse, interpret and evaluate new and/or abstract data and situations without guidance;
- Use a wide range of appropriate techniques and transform data and concepts into novel solutions;
- Read, interpret and analyse published accounts and to evaluate the well-being and potential of a company using ratio analysis;
- Anticipate likely changes in policy and economic conditions given the current economic and political environment.

Practical skills – able to:

- 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;
- Give professional presentations;
- Seek, interpret, present and use data effectively in decision-making;
- Produce creative and realistic solutions to complex problems;
- Use a range of different perspectives to analyse an organisation;
- Identify key issues in human resource management and design a recruitment process and conduct a selection interview;
- Communicate competently with numerical data;
- Participate in managerial decision processes where accounting based information is an important input;
- Assess both the technological and market viability of an idea and select the most appropriate route to market;
- Effectively use Information Technology.

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	The minimum entry requirements for all Biotechnology courses are AAA overall at A2 level, to include: A in Chemistry A in another science subject (Biology is preferred but not mandatory) or Mathematics The ideal combinations would be Chemistry and two further science subjects or Chemistry and one further science subject and Mathematics, but other combinations are considered. Two AS levels may be acceptable in place of a third A level. This is in addition to Grade B or above in GCSE Mathematics, Chemistry, Biology (or Combined Sciences)
Non-academic Requirements	None
Home/EU/international students will be invited to attend an interview	
English Requirement	IELTS 6.5 with a minimum of 6.0 in each element or equivalent
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	• Laboratory • Lectures • Tutorials • Seminars • Practical classes and field work • Equipment/technique demonstrations • Workshops • Case studies • Group work exercises • Formal presentations
E-learning & Blended Learning Methods	• Computer-based work • Pre-programme VLE modules • On-line discussion forums • On-line lecture materials • Interactive content including video and module quizzes

Project and Placement Learning Methods	• Group project • Research project/dissertation • Site visits
Assessment Strategy	
Assessment Methods	• Written Examinations • Coursework • Continuous assessments • Multiple Choice Tests • Case Studies Participation • Laboratory write-ups • Essays • Reports • Dissertations • Presentations • Individual research project report • Viva
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.	
The College's Policy on Re-sits is available at: www.imperial.ac.uk/registry/exams/resit	
The College's Policy on Mitigating Circumstances is available at: www.imperial.ac.uk/registry/exams	
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, 3 and 4. The year weightings for students admitted in or after October 2013 are 7.1: 21.4: 35.7: 35.7, respectively. The year weightings for students admitted before October 2013 are 5:25:35:35. 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%

Year	% Year Weighting	Module	% Module Weighting
Year One	7.1%	Molecular Biology	25%
		Proteins and Enzymes	25%
		Biological Chemistry	25%
		Cell Biology	25%
Year Two	21.4%	Genes and Genomics	16.6r%
		Integrative Cell Biology	16.6r%
		Fundamentals of Molecular Biochemistry	16.6r%
		Protein Science	16.6r%
		Tutored Dissertation	11.6r%
		Topics in Biotechnology	11.6r%
		One module from elective group (A)	10%
Year Three	35.7%	***EITHER:*** Laboratory Based Research Project ***OR*** Literature Based Dissertation ***AND*** Science Communication	35%
		One module from elective group (B)	21.66r%
		One module from elective group (C)	21.66r%
		One module from elective group (D)	21.66r%
Year Four	35.7%	Group Project	16.66r%
		Accounting, Business Economics	8.33r%
		Business Strategy	8.33r%
		Entrepreneurship	8.33r%
		Finance and Financial Management	8.33r%
		Global Business Management	8.33r%
		Marketing	8.33r%
		Organisational Behaviour and Human Resource Management	8.33r%
		Innovation Management	8.33r%
		Sustainable Business Development	8.33r%

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	CORE	2	44	129	0	175	75%	0%	25%	5	7.00
N/A	Horizons	ELECTIVE (A)	2	Various			150	Various				6.00
N/A	Business for Professional Engineers & Scientists	ELECTIVE (A)	2	Various			150	Various				6.00
LS3-FYRP	Lab Based Research Project	CORE*	3	360	165	0	525	0%	100%	0%	6	21.00
LS3-FYRD	Literature Based Dissertation	CORE*	3	10	315	0	325	0%	100%	0%	6	13.00

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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-SCICOMM	Science Communication	CORE*	3	31	169	0	200	0%	100%	0%	6	8.00
LS3-ATPMB	Plant Biotechnology and Development	ELECTIVE (B)	3	56	269	0	325	75%	9%	16%	6	13.00
LS3-DRIBS	Damage and Repair in Biological Systems	ELECTIVE (B)	3	58.5	266.5	0	325	75%	17%	8%	6	13.00
LS3-M3D	Macromolecules in Three Dimensions	ELECTIVE (B)	3	73	252	0	325	75%	20%	5%	6	13.00
LS3-MM	Medical Microbiology	ELECTIVE (B)	3	52	273	0	325	75%	5%	20%	6	13.00
LS3-SCRA	Stem Cells, Regeneration and Ageing	ELECTIVE (B)	3	50	275	0	325	75%	0%	25%	6	13.00
LS3-NR	Neuroscience Research	ELECTIVE (B)	3	46	279	0	325	75%	5%	20%	6	13.00
LS3-MNE	Metabolic and Network Engineering	ELECTIVE (B)	3	62	263	0	325	75%	9%	16%	6	13.00
LS3-ATII	Advanced Topics in Immunity and Infection	ELECTIVE (C)	3	57	268	0	325	75%	25%	0%	6	13.00
LS3-MPMI	Symbiosis, Plant Immunity and Disease	ELECTIVE (C)	3	48	277	0	325	75%	17.5%	7.5%	6	13.00
LS3-ATPVB	Advanced Topics in Parasitology and Vector Biology	ELECTIVE (C)	3	43.5	281.5	0	325	75%	22%	3%	6	13.00
LS3-ISB	Integrative Systems Biology	ELECTIVE (C)	3	73	252	0	325	75%	5%	20%	6	13.00
LS3-MGE	Mechanisms of Gene Expression	ELECTIVE (C)	3	38	287	0	325	75%	10%	15%	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-CANCER	Cancer	ELECTIVE (C)	3	56	269	0	325	75%	5%	20%	6	13.00
LS3-SB	Synthetic Biology	ELECTIVE (D)	3	52	273	0	325	75%	10%	15%	6	13.00
LS3-BDG	Biodiversity Genomics	ELECTIVE (D)	3	40	285	0	325	75%	10%	15%	6	13.00
LS3-MBBI	Molecular Basis of Bacterial Infection	ELECTIVE (D)	3	53	272	0	325	75%	0%	25%	6	13.00
LS3-BAP	Biotechnology Applications of Proteins	ELECTIVE (D)	3	62	263	0	325	75%	5%	20%	6	13.00
LS3-BIOINF	Bioinformatics	ELECTIVE (D)	3	61	264	0	325	75%	20%	5%	6	13.00
LS3-MG	Medical Glycobiology	ELECTIVE (D)	3	63	262	0	325	75%	16.5%	8.5%	6	13.00
LS3-SN	Systems Neuroscience	ELECTIVE (D)	3	44	281	0	325	75%	12.5%	12.5%	6	13.00
BS0600	Group Project	CORE	4	0	250	0	250	0%	100%	0%	6	10.00
BS0601	Accounting	CORE	4	32	93	0	125	70%	30%	0%	6	5.00
BS0602	Business Economics	CORE	4	27	98	0	125	70%	30%	0%	6	5.00
BS0603	Business Strategy	CORE	4	22	103	0	125	70%	30%	0%	6	5.00
BS0606	Entrepreneurship	CORE	4	22	103	0	125	60%	40%	0%	6	5.00
BS0607	Finance and Financial Management	CORE	4	27	98	0	125	70%	30%	0%	6	5.00

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
BS0609	Global Business Management	CORE	4	22	103	0	125	70%	30%	0%	6	5.00
BS0611	Marketing	CORE	4	22	103	0	125	70%	30%	0%	6	5.00
BS0612	Organisational Behaviour and Human Resource Management	CORE	4	22	103	0	125	70%	30%	0%	6	5.00
BS0616	Innovation Management	CORE	4	22	103	0	125	70%	30%	0%	6	5.00
BS0618	Sustainable Business Development	CORE	4	22	103	0	125	70%	30%	0%	6	5.00
BS0690	Accounting Primer	CORE	4	10	15	0	25	N/A				
BS0691	Pre-Programme Maths	CORE	4	10	15	0	25	N/A				
BS1314	Study Skills	CORE	4	10	15	0	25	N/A				
BS1317	Plagiarism Awareness	CORE	4	10	15	0	25	N/A				

*See Y3 table on page 6 (above).

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 programme is consistent with the Qualifications Framework of the European Higher Education Area which is available at: http://www.ehea.info/Uploads/qualification/QF-EHEA-May2005.pdf