

**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 | | | | |
|--|---------------------------------|-----|-------|-----|
| Award(s) | BSc | | | |
| Associateship | Royal College of Science (ARCS) | | | |
| Programme Title | Programme Code | | | |
| Biochemistry with a Year in Industry/Research | C701 | | | |
| Biochemistry with Research Abroad | C702 | | | |
| Awarding Institution | Imperial College London | | | |
| Teaching Institution | Imperial College London | | | |
| Faculty | Faculty of Natural Sciences | | | |
| Department | Department of Life Sciences | | | |
| 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 | 2016/17 entry | | | |
| Person responsible for the specification | Professor Anne Dell | | | |
| Date of introduction of programme | | | | |
| Date of programme specification/revision | August 2016 | | | |

Description of Programme Contents

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.

In the first two years students will tackle core subjects to ensure that they receive a solid grounding in fundamentals.

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.

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.

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

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)

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

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.

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

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|----------------------|---|
| Academic Requirement | <p>The minimum entry requirements for all Biochemistry courses are AAA overall at A2 level, to include:</p> <p>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.</p> <p>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)</p> |
|----------------------|---|

| | |
|---------------------------|------|
| Non-academic Requirements | None |
|---------------------------|------|

Offers for our Biochemistry, Biotechnology and Biological Sciences courses are made based on information supplied on the UCAS form. Generally, we do not hold interviews.

| | |
|---------------------|---|
| 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 | <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

- Written Examinations
- Coursework
- 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 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%

| 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-M3D | Macromolecules in Three Dimensions | 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-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 |
| LS3-ATPVB | Advanced Topics in Parasitology and Vector Biology | ELECTIVE (D) | 4 | 43.5 | 281.5 | 0 | 325 | 75% | 22% | 3% | 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-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 (D) | 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-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 |

*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 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>