Programme Specification Document

Approved, 2022.03

Overview

Programme Code	36142
Programme Title	Biotechnology
Awarding Institution	Liverpool John Moores University
Programme Type	Degree
Language of Programme	All LJMU programmes are delivered and assessed in English
Programme Leader	Kate Evans
Link Tutor(s)	

Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Bachelor of Science with Honours - BSH	See Learning Outcomes Below
Recruitable Target	Bachelor of Science with Honours (SW) - SBSH	See Learning Outcomes Below
Alternative Exit	Diploma in Higher Education (SW) - SDHE	Generate ideas through the analysis of concepts at an abstract level, with a command of highly specialised skills and the formulation of responses to concrete and abstract problems. Accept responsibility for group and personal work. Analyse and evaluate information, demonstrating significant judgement across a broad range of Biotechnology related areas.
Alternative Exit	Bachelor of Science (SW) - SBS	Demonstrate a broad and comparative knowledge of the general scope of the subject, its different areas and applications, and its interactions with related subjects. A detailed knowledge of a defined subject or a more limited coverage of a specialist area balanced by a wider range of study. In each case, specialised study will be informed by current developments in the subject. Demonstrate a critical understanding of the essential theories, principles and concepts of the subject(s) and of the ways in which these are developed through the main methods of enquiry in the subject.
Alternative Exit	Diploma of Higher Education - DHE	Generate ideas through the analysis of concepts at an abstract level, with a command of highly specialised skills and the formulation of responses to concrete and abstract problems. Accept responsibility for group and personal work. Analyse and evaluate information, demonstrating significant judgement across a broad range of Biotechnology related areas.
Alternative Exit	Bachelor of Science - BS	Demonstrate a broad and comparative knowledge of the general scope of the subject, its different areas and applications, and its interactions with related subjects. A detailed knowledge of a defined subject or a more limited coverage of a specialist area balanced by a wider range of study. In each case, specialised study will be informed by current developments in the subject. Demonstrate a critical understanding of the essential theories, principles and concepts of the subject(s) and of the ways in which these are developed through the main methods of enquiry in the subject.
Alternative Exit	Certificate of Higher Education - CHE	Apply a broad knowledge base, incorporating theoretical concepts and employing a wide range of specialised skills to real and theoretical Biotechnology applications. Evaluate information using it to plan and develop investigative strategies and to determine solutions to a wide range of scientific problems. Operate in a range of science contexts, and take responsibility for their contributions and outputs.

Alternate Award Names	

External Benchmarks

Subject Benchmark Statement	UG-Biosciences (2019)

Programme Offering(s)

Mode of Study, Mode of Delivery	Intake Month	Teaching Institution	Programme Length
Sandwich Year Out, Face to Face	September	LJMU Taught	4 Years
Full-Time, Face to Face	September	LJMU Taught	3 Years

Aims and Outcomes

Educational Aims of the Programme

To provide for all students a defined academic programme of study with clear learning outcomes. To provide students with a wide knowledge and understanding of core subject matter to enable them to pursue a career in Biotechnology related employment. To enable students to acquire a high level of practical, analytical and research skills in biotechnology. To develop critical, analytical problem-based learning and transferable skills to prepare the student for graduate employment. To develop those learning, information technology, communication and reflective skills necessary to enable students to undertake independent study, and to participate in lifelong learning. To encourage students to engage with employability skills by completing a self-awareness statement. To provide students from a wide variety of educational backgrounds with a high quality learning experience in a supportive environment. To provide opportunities for students to gain commercial awareness, develop entrepreneurial skills and explore a wide range of career options. In addition to the aims for the main target award, the sandwich programme aim is to provide students with an extended period of work experience at an approved partner that will complement their programme of study at LJMU. This will give the students the opportunity to develop professional skills relevant to their programme of study, as well as attitude and behaviours necessary for employment in a diverse and changing environment.

Learning Outcomes

Code	Description
PLO1	Appreciate fundamental concepts, principles and theories relevant to biotechnology encompassing molecular, cellular and physiological processes, microbiology, biochemistry, synthetic biology and genetics.
PLO2	Apply subject knowledge and understanding to address familiar and unfamiliar problems.
PLO3	Recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct.
PLO4	Demonstrate competence and progressive development in the basic and core experimental skills appropriate to the study of biotechnology.

Code	Description
PLO5	Design, plan, conduct and report on investigations which may involve primary or secondary data.
PLO6	Obtain, record, collate and analyse data using appropriate techniques working either individually or within a group.
PLO7	Comply with health and safety policies, Good Laboratory Practice (GLP), risk and Control of Substances Hazardous to Health (COSHH) assessments and recognise the importance of quality control and quality assurances.
PLO8	Use and interpret a variety of sources of information: textual, numerical, verbal and graphical within the laboratory setting.
PLO9	Understand the need when undertaking sample selection to ensure validity, accuracy, calibration, precision, reproducibility and the need to highlight uncertainty and potential sources of bias during data collection.
PLO10	Prepare, process, interpret and present data using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets, bioinformatics, and programmes for presenting data visually.
PLO11	Communicate scientific information effectively in written, verbal, and visual forms.
PLO12	Demonstrate competence in core experimental skills applicable to the biotechnology sector, including data analysis and interpretation of results with a critical understanding of the appropriate contexts for their use through the study of texts, original papers and reports.
PLO13	Use information technology to prepare, process and present information.
PLO14	Identify and work towards targets for personal, academic, professional and career development.
PLO15	Develop skills necessary for independent life-long learning (for example working independently, working as part of a team, time management, problem solving, organisational and enterprise skills).
PLO16	Engage with current developments in biotechnology and their applications, including the philosophical and ethical issues involved.
PLO17	Critically evaluate current research in the field of biotechnology.
PLO18	Analyse, synthesise and summarise information critically from a variety of sources including published research or reports.
PLO19	Recognise and apply subject specific theories, paradigms, concepts or principles, for example the relationship between genes and proteins.
PLO20	Construct grammatically correct documents in an appropriate academic style and format, using and referencing relevant ideas and evidence.
PLO21	Understand the importance of academic and research integrity.
PLO22	Obtain and integrate several lines of subject specific evidence to formulate and test hypotheses.

Programme Structure

Programme Structure Description

Study Abroad Students will be offered the opportunity of study abroad at Level 5. Students can choose either Option A or Option B unless they undertake the Sandwich Year, in which case Option B is not available: Option A: replacement of 60 credits of Level 5 with appropriate study abroad. The programme will offer the opportunity of 60 credits of study at Level 5. Students will be enrolled on a 360 credit honours with study abroad programme. A 60 credit Level 5 study abroad module [5114BCBMOL] will normally replace the semester 2 modules on the standard programme. This study abroad should cover the same learning outcomes as the modules being replaced. The modules to be studied in the host institution must be agreed in advance. The Level 5 mean for the final award mark will be calculated based upon the 120 credits at Level 5. Option B: additional study year abroad following Level 5. The programme will offer the opportunity of an additional study year abroad following Level 5. Students will be enrolled on a 480 credit honours with study abroad programme. Of those 480 credits, 120 will be taken via a Level 5 study abroad module [5113BCBMOL], the modules to be studied in the host institution must be agreed in advance. The Level 5 mean for the final award mark will be calculated based upon the 240 credits at Level 5. Sandwich Year [5112BCBMOL] The aim is to provide students with an extended period of work experience at an approved partner that will complement their programme of study at LJMU. This will give the students the opportunity to develop professional skills relevant to their programme of study, as well as attitude and behaviours necessary for employment in a diverse and changing environment. The placement year will follow Level 5 and students will be enrolled on a 480 credit honours sandwich programme.

Programme Structure - 360 credit points	
Level 4 - 120 credit points	
Level 4 Core - 120 credit points	CORE
[MODULE] 4102BCBMOL Introduction to Structural and Functional Biochemistry Approved 2022.01 - 20 credit points	
[MODULE] 4104BCBMOL Physiological Biochemistry Approved 2022.01 - 20 credit points	
[MODULE] 4110BCBMOL Introduction to Biotechnology Approved 2022.02 - 20 credit points	
[MODULE] 4111BCBMOL Practical Skills in Biotechnology Approved 2022.01 - 20 credit points	
[MODULE] 4112BCBMOL Microbial Biotechnology 1 Approved 2022.01 - 20 credit points	
[MODULE] 4115BCBMOL Introduction to Molecular Biology Approved 2022.01 - 20 credit points	
Level 5 - 120 credit points	
Level 5 Core - 120 credit points	CORE
[MODULE] 5004PHASCI Sterile Pharmaceutical Products Approved 2022.01 - 20 credit points	
[MODULE] 5104BCBMOL Structural and Functional Biochemistry Approved 2022.01 - 20 credit points	
[MODULE] 5105BCBMOL Molecular Biology and Functional Genomics Approved 2022.01 - 20 credit points	
[MODULE] 5110BCBMOL Research Methods in Biotechnology Approved 2022.01 - 20 credit points	
[MODULE] 5111BCBMOL Synthetic Biology and Bioengineering 1 Approved 2022.01 - 20 credit points	
[MODULE] 5115BCBMOL Microbial Biotechnology 2 Approved 2022.01 - 20 credit points	
Optional placement - 120 credit points	OPTIONAL
Placement Year - 120 credit points	OPTIONAL
[MODULE] 5112BCBMOL Sandwich Year - Biotechnology Approved 2022.01 - 120 credit points	
OR Study Abroad - 120 credit points	OPTIONAL
[MODULE] 5113BCBMOL Study Year Abroad - Biotechnology Approved 2022.01 - 120 credit points	
Optional Study Semester - 60 credit points	OPTIONAL

[MODULE] 5114BCBMOL Study Semester Abroad - Biotechnology Approved 2022.01 - 60 credit points	
Level 6 - 120 credit points	
Level 6 Core - 100 credit points	CORE
[MODULE] 6100GNBMOL Research Project Approved 2022.01 - 40 credit points	
[MODULE] 6105BCBMOL Current Topics in Biotechnology Approved 2022.01 - 20 credit points	
[MODULE] 6106BCBMOL Biotechnology Entrepreneurship Approved 2022.01 - 20 credit points	
[MODULE] 6107BCBMOL Synthetic Biology and Bioengineering 2 Approved 2022.01 - 20 credit points	
Level 6 Optional - 20 credit points	OPTIONAL
[MODULE] 6104BCBMOL Microbial Technology Approved 2022.01 - 20 credit points	
[MODULE] 6107BMBMOL Biomaterials Approved 2022.01 - 20 credit points	
[MODULE] 6108BMBMOL Work-Based Learning Approved 2022.01 - 20 credit points	

Module specifications may be accessed at https://proformas.ljmu.ac.uk/Default.aspx

Teaching, Learning and Assessment

The acquisition of knowledge is fostered through a range of taught sessions including lectures, computer sessions, and practical laboratory classes. Understanding of taught material is facilitated through tutorials, problem-based learning, workshops, group work and independent study. Knowledge and understanding are assessed in a variety of ways. These include: examinations (essay style questions, MCQ, data analysis and short answers),laboratory reports, practical assessments (to assess both understanding and technical competence),essays, case-studies, oral presentations, and poster presentations. Cognitive skills are developed in many areas of the programme. For example, the ability to synthesise and analyse information critically is developed in laboratory sessions from Level 4 to 6, including in the Practical Skills in Biotechnology and the Research Project modules. Applying subject knowledge and understanding to address unfamiliar problems is developed in workshops in many modules, especially in modules that utilise interpretative examination questions. Moral and ethical issues are a key part of modern biotechnology and are developed in many taught and practical sessions. Laboratory reports, scientific communication, essays and examinations allow students to demonstrate the full range of these skills and attributes. Practical and professional skills are taught during laboratory classes (a component of most modules). Core principles and minimum standards required for effective laboratory work are introduced at Level 4, developed at Level 5, and at Level 6 the students apply these skills during their independent Research Project. If the student has chosen the Work-Based Learning module (WBL) then these practical skills will be developed in an applied work setting. These practical and professional skills are assessed through practical tests, data handling exercises, and laboratory reports, including the execution of the Research Project. Transferable and key skills are inherent within the programme, but specifically they are taught in core modules at all Levels (Practical Skills in Biotechnology and Introduction to Biotechnology at Level 4; Research Methods in Biotechnology at Level 5; Research Project at Level 6). These transferable and key skills are assessed through assessment activities at all levels, in all modules and specifically in the modules mentioned above.

Opportunities for work related learning

The programme also offers the option of a sandwich route, which involves 1 year of work experience in a specialist field. The sandwich placement occurs at the end of level 5 and the training allows students to develop their professional and technical skills. Work related learning is delivered throughout the programme and for those students who are eligible there is a level 6 Work-Based Learning (WBL) module. The WBL module is an option module for students who undertake approximately 140 hours engagement with a workplace environment, relevant to their subject discipline, during the course of an academic year. This would usually take place during the summer before the final year of study. The Faculty Placement Learning Support Unit (PLSU) provides support for students seeking work-based placements including Sandwich placements. Work-related learning opportunities are also available through the routes of employer guest lectures/workshops, and employer-driven assignments.

Entry Requirements

Type	Description
Other international requirements	A wide variety of qualifications may be acceptable provided that they equate to UK requirements. They should also provide evidence of English language ability equivalent to 6.0 IELTS.
NVQ	Applicants with either a HNC or HND will be considered on an individual basis and may be eligible for some recognition of prior learning.
International Baccalaureate	Applicants must have (or expect to obtain) the full award including grade 5 in an appropriate science.
A levels	Applicants should have (or expect to obtain) at least 2 'A2' levels or equivalent, including Biology and/or Chemistry with a minimum of 104 points.
Alternative qualifications considered	In common with standard University policy, applicants should have GCSE passes in Mathematics and English with a minimum grade C, or equivalent.
BTECs	BTEC applicants should hold or be studying an appropriate diploma and have (or expect to obtain) a pass with at least 3 merit grades at level 3 in appropriate units.

Extra Entry Requirements